

2024

Electronic Health Record Use Among Older Adults in Primary Care

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**ELECTRONIC HEALTH RECORD USE AMONG OLDER ADULTS
IN PRIMARY CARE**

By

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A Clinical Research Project
Submitted in Partial Fulfillment of the Requirements for the
Degree of Master of Science in Nursing,
College of Nursing and Health Sciences
Mississippi University for Women

COLUMBUS, MISSISSIPPI
August 2024

Graduate Committee Approval

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DEDICATION

From Santana: I want to dedicate my hard work to this research to my children Tyler, Skylar, John Jr., my husband John Sr., family, and friends for their support during my journey, and to the ones who inspired the completion of this program and study, but will never read it: Anna Davidson, Jerry Ivy, Anihya Nesbitt, Tyeicha Nesbitt, and Dr. Edmundson A. Miller. Also, I give special dedication to my advisor, Dr. Renea Hopple, who was my light in the darkness for her continued motivation and encouragement throughout the program, and Dr. Alena Groves. I am forever grateful for it all.

Abstract

The use of Electronic Health Records (EHR) has transformed the way healthcare providers deliver patient care. EHRs enable quick access to patient records from various providers, leading to a more comprehensive approach to healthcare. They have become an essential tool for both healthcare professionals and patients. The patient view of an EHR is often referred to as a patient portal. This study aims to explore the significance and advantages of patient portal utilization by examining previous research and highlighting the outcomes. It also seeks to identify barriers that prevent patients over the age of 65 from using their EHR, with the goal of addressing modifiable barriers to increase utilization rates. The data for this study was gathered from 166 paper surveys completed by patients at two primary care clinics in Mississippi and across several towns in the state. The collected data was entered into Qualtrics and analyzed using IBM SPSS statistical software by a statistician. The results indicated that among the seventy-two participants who reported having a primary care provider (PCP) offering a patient portal, less than half (45.8%) had ever accessed their patient portal. Additionally, the study concluded that in this sample population, there was no association between the use of EHR and patient satisfaction. The most common barrier reported by participants was their preference to talk to someone on the phone rather than using an online system, with the second most reported barrier being that 42.8% of participants were unaware if their PCP offered a patient portal. Interestingly, this study found that some barriers were not as prevalent in this patient population as they were in previous studies.

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CHAPTER I

Dimensions of the Problem

Electronic Health Records (EHR) have become a pivotal part of modern-day health care. Prior to EHRs, healthcare providers relied on the meticulous filing of paper charts and hard copies of patient's laboratory results, imaging studies, past medical and surgical history, and previous treatment plans in order to maintain an adequate record of each patient's medical care and prior encounters. The transition from a paper system to an electronic system began in the 1990s with the goal of bridging care gaps between multidisciplinary teams and improving patient care (Evans, 2016).

The first EHRs were utilized by large academic medical centers for in-patient hospital use. The first EHRs had only a few functions such as the capability for providers to place orders, view laboratory results, write prescriptions and dictate patient progress notes (Evans, 2016). EHRs have grown substantially since then to include numerous accessible functions for providers on patient care teams, as well as the patients. An advantage of EHRs is immediate access to the healthcare record via these electronic platforms. Having a convenient method of accessing records through internet applications benefits both patients and healthcare providers. A patient's view of an EHR is often referred to as a patient portal, electronic chart, and electronic medical record. Many patient portals that are associated with common electronic health records may be referred to as one of the following: AllScripts, APPatient, Athena Health, Healow App, and MyChart, to name a few.

Though EHRs have a learning curve for both health care providers and patients, they allow patients to take active roles in their care plans. EHRs are an interactive tool enabling patients to view lab results, update their medication list, request medication

refills, and schedule appointments. Many EHRs allow for secure correspondence with healthcare providers in addition to the recent addition of tele-medicine, bridging the gap between patients and providers. These technological advances are beneficial to patients and the healthcare team when adequately utilized. EHRs have been shown to decrease medical errors thus improving patient outcomes (*Electronic Health Records, 2023*).

In 2009, Congress passed the Health Information Technology for Economic and Clinical Health (HITECH) Act, requiring healthcare providers to adopt, convert, and demonstrate meaningful use of electronic medical records. Facilities and providers were given a transition period for this conversion. The HITECH Act provided substantial financial incentives to healthcare facilities to encourage the adoption and meaningful use of healthcare technology. The penalty for noncompliance after January 1, 2015, was reduced Medicare reimbursement (Nahm et al., 2020).

Unlike healthcare facilities, insurance companies do not incentivize patients to use their patient portals. To access and use the portal, patients must first see benefits that outweigh the inconveniences associated with learning to use the platform. Documented barriers to EHR use by patients include patient knowledge deficit about the patient portal, lack of internet access, and no access to a device with internet capabilities (Liu et al., 2022). EHR use has grown over time, but a major barrier for adoption is patient concern for privacy and security (Evans, 2016).

According to Evans et al. (2018), only 10% of older adults aged 65 years and older successfully navigate the transition to EHR usage. In an article published by Newman et al. (2020), the researchers concluded that the elderly population stands to benefit the most because they are more likely to have a chronic health condition. For

those with multiple chronic health conditions, patient portals can facilitate care coordination amongst specialists or facilities, as well as help patients and caregivers with medication management, and appointment reminders.

If mastered, the EHR can positively affect patient health outcomes and their perception of the quality of care they receive. EHR use allows health care providers to streamline patients' clinic visits and decrease time asking redundant questions. As a new age of technology ushers itself in, it is imperative to bridge the gap between such advancements and the elderly population, as they potentially have the most to gain. Adaptation to an EHR could lead to improved patient health outcomes, increased compliance, decreased stress for patients and families, and reduced medical expenses.

Problem Statement

As technology advances, many entities are moving toward paperless records. The world of healthcare is no different. It is suggested that the electronic patient health record can be a valuable resource to assist older adults in managing chronic health conditions to improve health outcomes. Evans et al. (2018) found that only about 10% of US adults use patient portals. Many older adults do not use electronic health records, negatively impacting their health and how their healthcare is perceived (Swoboda et al., 2021).

According to the Mississippi Office of Rural Health, almost 52% of the state's population live in nonmetropolitan areas with access to only twenty primary care physicians (PCPs) per county, compared to 130 PCPs per county in urban areas. Of the rural residents, 17.6 % are over the age of 65 (Dugan et al., 2023). The National Center for Health Statistics reports that rural residents across the U.S. report higher rates of multiple chronic conditions. Chronic disease self-management is critical to healthy aging

(Dugan et al., 2023). Patient portals serve as a tool to bridge this gap between providers and patients. Patient portals have been utilized since their introduction, but Mississippi's elderly population is one of the most underrepresented populations that stand to benefit most from their usage. In 2017, 57.1% of the adult population in Mississippi had multiple chronic health conditions (Newman et al., 2020). It is crucial to evaluate the factors affecting the elderly population's utilization of patient portals and the impact on their perceptions of healthcare.

Statement of Purpose

Utilizing the patient portal is highly beneficial to patients in the primary care setting by allowing them to be involved with their care; however, it can be challenging for older adult patients. Healthcare providers highly encourage patient portal use to empower patients, improve quality of care, improve communication, and increase patient satisfaction. Although patient portals vary per facility, they all share similar features, such as allowing patients to update personal information, view laboratory results, access active medication prescriptions, and securely communicate with a provider. Portal use by patients can also increase productivity during primary care visits. If personal information is up to date within the portal, this increases the time allowed for the physical examination, education, and discussion of treatment options with patients. This study aims to identify barriers affecting older adults' use of the patient portal and determine how it impacts their perceptions of healthcare quality in rural Mississippi.

Significance

According to The United Health Foundation, more than 55.8 million adults older than sixty-five live in the United States (US). This substantial number accounts for 16.8%

of America's population and is projected to reach 22% of the population by the year 2040. People born between 1946 and 1964 are considered the "baby boomer" generation. When the remainder of the baby boomer generation advances into older adulthood, the estimated population of older adults in the US will increase to approximately 73.1 million. The older adult population in Mississippi accounts for 16% of the state's population. In The United Health Foundation's *2023 Senior Report*, Mississippi was the least healthy state for older adults and showed the most significant opportunity for improvement in older adult health (United Health Foundation, 2023). Patient portals can be beneficial to all users, but especially to those with high healthcare needs, such as older adults managing chronic illnesses. According to The National Council on Aging, almost 95% of adults over sixty have at least one chronic condition, and nearly 80% have two or more chronic conditions (National Council on Aging, 2023).

The older adult population continues to grow, technology continues to advance, and healthcare must adapt to these changes to support older adults as they age. In a study performed by Wildenbos et al. (2018), patient portal activation rates were the highest of all age groups in the older adult population, demonstrating the increased interest of older adults in utilizing the patient portal. However, published research suggests patient portal use to be challenging in older adults. Healthcare providers need additional efforts to address these barriers and optimize portal use in older adults. By researching and identifying these potential barriers to patient portal use, steps can be taken to improve the use of the portal and to improve the perceived quality of care from older adults in the future.

Conceptual Framework

Nola Pender's Health Promotion Model (HPM) is the framework identified to support the current research. The Pender HPM has been utilized in multiple studies to validate the HPM concept further. Pender developed the HPM to focus on the holistic well-being of patients. The HPM has been revised twice since the development of the original theory in 1982. The purpose of the HPM is to help individuals understand the factors that influence their health behaviors and use this knowledge as a basis for counseling to promote healthy lifestyles (Pender, 2011). The model incorporated the main categories of the nursing metaparadigm (human beings, environment, health, and nursing) and incorporated the effects of other external factors.

Multiple theories influenced Pender's HPM. One of the theories was Albert Bandura's (1977) social cognitive theory, which provided the social aspect of the model (self-attribution, self-evaluation, and self-efficacy). Another theorist was Feather's (1982) expectancy-value model of human motivation, which provides insight into the economic influence on behaviors. Additionally, Becker (1974) developed the health belief model. The health belief model explains a person's behavior based on their disease. The only difference between the health belief model and the HPM is that the HPM includes fear and threats as a source of motivation for health behavior (Alligood, 2022).

In the revised HPM, Pender added three more variables: activity-related effect, commitment to a plan of action, and immediate competing demand and preferences. The HPM focuses on ten health-promoting behaviors. Individual characteristics and experiences include prior related behavior and personal factors (biological, psychological, and sociocultural). The HPM then goes into behavior-specific cognitions

and affect, perceived benefits of action, perceived barriers of movement, perceived self-efficacy, activity-related effect, interpersonal influences (family, peers, providers), norms, support, models, and situational influences: options, demand characteristics, and aesthetics. The behavioral outcome is the final concept of the HPM model that identifies immediate competing demands (low control) and preferences (high control), commitment to a plan of action, and health-promoting behavior (Alligood, 2022).

For this study, the researchers hoped to identify which behaviors or personal factors hinder access to the EHR for older adults. In this research, the emphasis was on the behavior-specific cognitions and affected perceived barriers to action. This allowed the researchers to identify barriers and identify recommendations for further study.

Research Questions and Hypothesis

The researchers identified three research questions to guide the study of barriers that affect older adults' utilization of electronic health records (EHR) and their effects on clinical visits.

1. Do older adults utilize an EHR at their primary care provider's clinic?
2. Is there a correlation between patient satisfaction with their PCP and the use of EHR?
3. What are the reported barriers to EHR use among older adults?

The researchers hypothesized that the sample, comprised of older adults, would express challenges in using the EHR leading to underutilized EHR and decreased patient satisfaction with their primary care provider. The researchers also hypothesized the older population would identify technology education and ease of use of electronics to hinder the use of EHR.

Definition of Terms

Several terms used in the research questions and within the project were defined for clarity and operationalized for measurement. Definitions of terms were developed by the researchers and within the context of the project.

Older Adult

The researchers defined an older adult as any person aged 65 years or older. Age was determined by the intake nurse using a government-issued identification card. This was measured using question number one on the survey questionnaire.

Utilize

For this study, the researchers defined utilize as logging in to the EHR, using the EHR to schedule appointments, communicate with healthcare providers, view laboratory and imaging results, and request medication prescription refills. The researchers measured this by asking question number eight on the survey questionnaire.

Electronic Health Record

The researchers defined an electronic health record as a digital version of individual health-related information that can be accessed on an internet-capable device. For this study, electronic health record is synonymous with electronic patient portal and patient portal. The researchers measured this using self-reported surveys from participants aged 65 years and older.

Primary Care Provider

For this study, the researchers defined primary care provider as any person who provides direct medical care to a patient and who is a medical doctor (MD) or nurse

practitioner (NP). Subjects self-reported an established relationship with a primary care provider using questions number four and five on the survey questionnaire.

Patient Satisfaction

In the survey, the researchers defined patient satisfaction as any patient who is currently satisfied with the care provided to them by their primary care provider. This is a multivariable response that may have a positive or negative correlation with the use of patient EHR. This was measured using question number six and ten on the survey questionnaire.

Barriers

In the survey, the researchers defined barriers as any obstacle that impedes the utilization of EHR by older adults. This was measured using questions number four, seven, eight, 11, 12 and 13 on the survey questionnaire.

Electronic Device

The researchers defined electronic devices as technology that can access the World Wide Web (i.e., cell phones, tablets, computers, etc.). The participants self-reported the use of an electronic device. The researchers measured participant access to an electronic device in question 11 on the survey questionnaire.

Internet

Internet was defined as an electronic communications network that connects computer networks and organizational computer facilities worldwide. Participants self-reported whether or not they have access to an interconnected computer network.

Assumptions

For this study, the following assumptions were made:

1. The researchers assumed that older adults do not utilize electronic health records.
2. The researchers assumed that electronic health records negatively impacted the older adult's perception of the quality of their healthcare.
3. The researchers assumed that older adults are not accustomed to using electronic health records.

Limitations

This study had several limitations, one of which was the rural location of the patient population. Data was collected over three months in rural Mississippi. The researchers aimed to sample a diverse and generalizable population. Still, disparities that older adults face in Mississippi differ from those of older adults in urban areas in another state, potentially limiting widespread generalizability. The second limitation acknowledged is the time frame in which data was gathered. Data was collected from March 2024 until May 2024, accounting for less than half of the year. Another limitation was the format in which data was collected. As the researchers acknowledge specific technological challenges older adults experience, a physical written survey was used to gather information. Participants were asked to complete a survey while visiting their healthcare provider at a privately owned clinic. Some participants may have low literacy levels, difficulty with reading and writing, as well as vision and physical impairments. The research team was unable to supply a support person to all eligible participants to help them complete the survey, so all completed surveys were completed on the participant's own merit. The population was limited to patients of healthcare providers who work at a privately owned clinic.

Summary

In the US, there are more than 55.8 million older adults, which is predicted to increase to 73.1 million by the year 2040 (United Health Foundation, 2023). Older adults have particularly high healthcare needs due to the prevalence of chronic illnesses. Approximately 80% of older adults have at least one chronic illness, and 77% of older adults have at least two chronic illnesses (Nahm et al., 2020). Through patient portals, healthcare providers have an increased opportunity to improve the quality of care and support older adults as they age. Patient portals can promote communication between patients and providers, increase patient education, and improve participation in treatment goals. Using Nola Pender's HPM as a theoretical framework and using data acquired through the literature review, the researchers aimed to identify areas in which patient portal use can be optimized in the older adult population to improve the quality of care.

CHAPTER II

Before initiating the study, the researchers conducted a review of literature to identify prior research on older adults and their utilization of EHRs. The Mississippi University for Women library EBSCO (Elton B. Stephens Company) discovery search engine was used to locate articles. Eligible articles consisted of studies performed in the United States no more than five years prior to the initiation of this study. Prior research was used to support the necessity for the study and guide its development. The researchers used Nola Pender's Health Promotion Model (HPM) as a theoretical framework to undergird the research.

Conceptual Framework

Nola Pender was a profound leader in the nursing field, and her efforts continue to impact healthcare today. Nola Pender's research was founded on her belief that the goal of nursing was to help people care for themselves and their health across the human lifespan. She created the HPM, which continues to evolve with the advancements in healthcare and current research. Nola Pender's HPM utilized a holistic approach to portray the complex nature of humans interacting with environmental factors as they pursue optimal health across their lifespans. Pender emphasized the patient's role in his or her health and the benefits of health-promoting behaviors. The HPM has been used in various fields of research, and her concepts continue to apply to healthcare today (Alligood, 2022).

While developing the HPM, Pender and her husband, Dr. Albert Pender, conducted a cross-sectional survey to evaluate the relationships between the psychosocial and behavioral characteristics of a specific population in Illinois. The researchers

evaluated the population's intentions to utilize disease prevention measures and health promotion services provided by nurse practitioners (NPs). The services were physical examinations, preventative screenings, supportive services for those with chronic illnesses, breast examinations, health education, preparation for the death of a family member, stress management, family and marriage counseling, and retirement recommendations. Their study aimed to determine specific subgroups within the population that were most likely to use the services provided by the NPs (Pender & Pender, 1980).

Data was collected from March to May of 1978 in northern Illinois. The sample size was 388 adults. Of the sample, 41% were males and 59% were females. Participants were randomly selected. Data was collected via telephone interview and revealed that the majority (61%) of the participants intended to use one or more of the services provided by the NPs when the services became available within the community. Of the sample, 35% stated they would not use the health promotion services if NPs provided them. The best predictors of intention to use the NPs' services were direct pay, education level beyond high school, and a low level of life stress (Pender & Pender, 1980).

This research study by Pender and her husband was performed prior to the release of the original HPM; however, the intentions of the HPM and this research study are quite similar. Illness prevention and health promotion strategies implemented by NPs in this northern Illinois county could impact the long-term health of their population. The services provided by NPs encouraged individuals to take responsibility for their own health and establish health-promoting behaviors. The Penders' research study supported

the complementary role of NPs within the healthcare system and their ability to positively impact health over the human lifespan (Pender & Pender, 1980).

Polat and Aylaz (2022) performed a research study evaluating the effects of exercise training on menopausal women using Nola Pender's HPM as a theoretical framework. Menopause is a normal physiologic process in the female body that typically occurs around ages 45 to 55. This physiologic process occurs due to the decrease in ovarian function over time, resulting in a decrease in estrogen and progesterone secretion. As sex hormones decrease, women can experience various undesired symptoms that can negatively affect the quality of life in many women (Polat & Aylaz, 2022).

Polat and Aylaz (2022) utilized a randomized controlled trial (RCT) for their study. A sample of 156 menopausal women (n=156) were randomly selected for the study. Of these women, seventy-eight were in the experimental group, and seventy-eight were in the control group. The data was collected between 2018 and 2019 through face-to-face, home-based interviews (Polat & Aylaz, 2022).

Pre-test data was collected during the first home visit. In the experimental group, this visit involved completing a Menopause Rating Scale (MRS) to measure the severity of menopausal symptoms. On this scale, a higher score indicated more severe symptoms. A Health-Promoting Lifestyle Profile I (HPLP-I) form was also given to assess health-promotion lifestyle behaviors. On this scale, a higher score indicated increased healthy lifestyle behaviors. Lastly, the experimental group participants were educated on exercise training and were given a training manual based on Nola Pender's HPM. Women were educated on exercise recommendations, including 30-minute moderate-intensity walking for three days a week and four days of power, balance, and stretching exercises. The

control group participants were also given the MRS and HPLP-I forms; however, they were not provided with education on exercise training at this point in the study. One month after the initial visit, the women were provided with another 60-minute exercise training session. Three months after the initial visit, participants in the experimental group completed the MRS and HPLP-I forms again, and the control group participants were provided with the exercise training session and training manual (Polat & Aylaz, 2022).

The findings of the study revealed that 12 weeks of a moderate-intensity exercise program reduced the severity of menopausal symptoms in women and enhanced their self-reported quality of life. MRS pre-test score differences between the control group and the experimental group were not statistically significant ($p=0.064$). When comparing pre-test and post-test scores, MRS total mean scores decreased in the experimental group and increased in the control group, which was statistically significant ($p=0.000$). HPLP-I mean scores increased in the experimental group and decreased in the control group, which was also statistically significant ($p=0.000$). Using Nola Pender's HPM as a framework, this study revealed that a healthy lifestyle and exercise can improve menopausal symptoms. Furthermore, these actions can improve women's health throughout this phase of life and across the lifespan (Polat & Aylaz, 2022).

Martinelli (1999) performed a study to evaluate an explanatory model of health-promoting behaviors of smoking and nonsmoking in college students by using Nola Pender's HPM as a theoretical framework. Throughout the college years, students have many experiences that can potentially affect their long-term health positively or negatively. Students transition to living with more independence and are presented with

choices to establish healthy lifestyle practices or participate in lifestyle practices that are unhealthy, such as smoking. Smoking can lead to long-term health consequences: obstructive lung diseases, lung cancer, and cardiovascular disease. Approximately 75% of young smokers continue smoking into adulthood. Situational and environmental influences during the college years can impact the entirety of a person's adult life; therefore, establishing health-promoting behaviors (HPB) at an early age is vital to achieving health throughout the lifespan (Martinelli, 1999).

A private university in the US was utilized for the study. This university was comprised of a student body of 6,400 students, with all fifty states and 102 foreign countries represented within the college. Questionnaires were distributed among the classes and returned to the researcher for analysis. Participation in the study was voluntary and anonymous, with the total response rate being 66%. A total of 238 participants participated in the study. The questionnaire was composed of categories related to gender, smoking status, and perceived health status. Multiple instruments were used to evaluate self-reported measurement of Environmental Tobacco Smoke (ETS) avoidance, perceived control of health, and health-promoting lifestyle habits. In particular, the Health Promotion Lifestyle Profile (HPLP-1) was utilized, which was created based on Nola Pender's HPM (Martinelli, 1999).

Of the 238 participants (n=238) involved in the study, 158 (66%) were female and 80 (34%) were male. The average age of participants was 20 years old. Between genders, 37% of females were smokers, and 48% of males were smokers. Of the sample, 141 students were nonsmokers, and ninety-seven students were smokers. Several relationships were identified regarding the students' tendency to perform HPB.

According to Marinelli (1999), “Self-efficacy was the strongest predictor of the performance of HPB behaviors” (p. 267). Other factors had an impact on increased performance of HPB: avoidance of ETS, perceiving oneself as healthy, and female gender. Overall, males who smoked were the least likely to perform HPB (Martinelli, 1999).

Although this study by Martinelli (1999) was performed in 1999, it demonstrates the application of Nola Pender’s theory and applies to healthcare today. Pender’s HPM related to this study through concepts of prior related behaviors, personal factors, self-efficacy, and their effects on long-term health. The impact of smoking led to less HPB. Whether students realize it or not, behaviors established during the college years have the potential to impact health throughout their lives (Martinelli, 1999).

Whether young or old, Nola Pender’s HPM can apply to all phases of life, as evidenced by the reviewed research. The HPM was applicable in Nola Pender’s research study from the 1980s in menopausal women and in the study exploring the health of college-age students. Over time, Pender’s HPM has adapted with advancements in research and healthcare. A notable change in the 21st century is the advancement in technology. With this advancement, patient portals have become a primary way for patients to be involved in their own healthcare. However, the use of the patient portal can be challenging for older adults. To provide optimal care and promote health for older adult patients, barriers to using the patient portal must be identified and improved. Allgood (2022) discussed the HPM’s relationship to technology advancements by stating that this model “fosters thinking about future opportunities and influences the use of technological advances, such as the electronic health record, as a means to achieve

prevention and health promotion” (p. 327). Patient portals present the opportunity for patients to become more educated about their treatment plans, take responsibility for their personal health behaviors, and become more involved in their healthcare (Alligood, 2022). Patients have the opportunity to feel more in control of their healthcare.

Review of Related Literature

Saif et al. (2022) conducted a study to promote patient portal usage in populations identified as low users. This study defined low users as older adults over the age of sixty-five, adolescents, minorities of racial or ethnic background, and patients who do not speak English. The study focused on three key points to identify deficits and seek improvements. The first was patient education and awareness of the portal. The second key point identified the provider’s education and engagement with the patient's use of portals. Lastly, the research focused on evaluating the technology used in the patient portal.

The results concluded that older adults over the age of sixty-five were less likely to activate their patient portal in comparison to the control group but increased by 10.7% after the post-intervention assessment. The results demonstrated the efficacy of education involving patients and providers through an overall increase in patient portal activation across all populations. Adults over the age of sixty-five, adolescents, non-English speaking, Hispanic, and African American populations were still identified as low users in comparison to the control group at the follow-up assessment (Saif et al., 2022).

Cross et al. (2021) performed a cross-sectional analysis research study. The study aimed to determine the correlation between the patient portal and the perceived healthcare quality among older adults. The researchers identified two specific research

questions for their study. The first question assessed whether or not healthcare quality was affected by the level of patient portal engagement in older adults. The second question evaluated how older adult patients perceive their provider's use of the portal and its effect on their perceived value of the portal.

The sample size was 158 adults (n=158) over the age of 65. The first section of the survey evaluated the use of seven different patient portal features. By their responses, the participants were categorized as nonusers, moderate users, or extensive users. The second section of the survey evaluated the respondents' perceptions of the providers' use of the patient portal and how it impacts the value of the patient portal. The respondents were divided into two groups based on their perception of the patient portal: those who valued it highly and those who did not (Cross et al., 2021).

Overall, respondents who were moderate portal users were the least satisfied with their healthcare. Additionally, respondents who were nonusers or moderate users were significantly less likely to have a high perceived value of the patient portal. Some respondents (41.5%) reported that the patient portal improved their relationship with their provider. Self-rated healthcare quality was found to be significantly higher for respondents with a high perceived value of the patient portal when compared to those with a low perceived value of the patient portal (Cross et al., 2021).

Park et al. (2020) performed a qualitative study to evaluate medication adherence and the use of electronics. The hypothesis was that older adults would express interest in using mobile health (mHealth) or other electronic health applications to manage their chronic conditions. The study involved six focus groups, three from a community hospital system and three from the Veterans Affairs (VA), conducted in three different

sessions. The participants had to meet the following criteria: older than 21 years of age, history of acute coronary syndrome (ACS) or percutaneous coronary intervention (PCI) within one year, and currently or formerly taking antiplatelet medication (Park et al., 2020).

The research team determined that utilizing electronic medication reminders was feasible in older adults. The researchers identified barriers for older adults, including forgetfulness and everyday distraction. The study concluded that the older generation is technologically competent, but they continued to require reminders on things that need to be completed. During the analysis, some of the participants found the text message reminder to be helpful in reminding participants to take their medication. The study found that most older adults did not use technology due to privacy and security concerns. At the conclusion of the study, there was an improvement of 65% in medication adherence with the utilization of electronic health records, thus encouraging autonomy in patient healthcare management (Park et al., 2020).

Swoboda et al. (2021) assessed the characteristics of patients who used electronic patient portals, who used them more frequently, and who perceived them as useful. They felt that obtaining a better understanding of these relationships would allow healthcare systems to better support patient use of portals by making them more patient centered. The researchers developed and tested two hypotheses. The first hypothesis stated that frequent users are more likely to utilize all of the functions the patient portals offer than those who use the portals infrequently. The second hypothesis stated that users who identify the portals to be useful are likely to use more of the portal functions than patients who do not recognize the portals as useful.

The authors pooled cross-sectional data from the 2017 to 2018 Health Information National Trends Survey (HINTS), a nationwide mail survey sponsored by the National Cancer Institute. The inclusion criteria consisted of adults over eighteen with an upcoming birthday during the collection months who had been offered online access to their medical records by their healthcare provider and had accessed their patient portal before the initiation of the study. These two questions resulted in a population size of 3,466, but only 58.3% of the respondents answered that they had used their patient portal within the last 12 months. The researchers surveyed the population to gather their opinions on patient portal usefulness and their frequency of use. Participants were asked to answer a series of questions regarding their use of ten specific functions in the patient portal (Swoboda et al., 2021).

They evaluated how often each participant reported using their portal and their perception of the portal in terms of usefulness employing weighted statistical analysis ordinal regression models. The researchers determined that patient portal usage was influenced by seven factors: age, race, education, metropolitan status, insurance status, and last routine evaluation. Participants who reported they used their patient portal in the previous year had a higher likelihood of using it again if they also had a bachelor's degree, an income of \$35,000-\$75,000, and at least two chronic diagnoses. The study concluded that patients with more health problems were more likely to utilize the patient portals and rate the portal as useful. In contrast, older adults over fifty, those not insured, and those who have not visited their healthcare provider within the last year had a lower probability of rating the portal as useful. The study concluded that 83.6% of participants reported they use the portal primarily to review test results. The study results suggested

that the increased frequency of patient portal use also increased the likelihood of utilizing more of its functions, directly related to patients' perception of its usefulness. The research obtained from this study confirmed that those aged sixty-five and older had the highest percentage of respondents who did not use the portal and the lowest percentage of respondents who used it one or more times (Swoboda et al., 2021).

Gleason et al. (2023) explored patient portal usage among older people diagnosed with dementia. They set the foundation for investigating this matter by acknowledging the rising significance of patient portals in navigating the health system. Participants in the study were 65-year-olds with two or more evaluation and management visits within five years (October 3, 2017–October 2, 2022). The patient portal activity was determined based on time or date-stamped interactions with login and session data. The authors examined portal activity data relevant to dementia diagnosis for all users of the portal as well as their proxies (using shared access credentials). Next, they looked at the monthly portal activity for a year before and a year after diagnosis by older adults with recently diagnosed dementia. Before and after diagnosis, statistical significance was determined using a paired t-test, with a 2-sided P-value of 0.5.

This study included 49,382 patients, and only 6.4% of the cohort had a dementia diagnosis. Dementia was not identified as a barrier to registration of patient portals. Patients with dementia had a three times higher likelihood of having a registered care partner with shared access to their portal account in comparison to patients without dementia. Care partners demonstrated their vital role in assisting patients with their portal by assisting them with the messaging function. Furthermore, compared to individuals without dementia, the research found that patients with dementia had lower portal activity

measurements. Both groups exhibited similar tendencies in terms of their site usage and the number of messages sent from their accounts. This outcome highlights the crucial role of care partners in supporting individuals with cognitive impairments to communicate effectively and engage with the patient portal. In the year after their diagnosis, patients used the patient portal more often, as shown by increased activity metrics, a rise in the number of messages delivered, and an increase in the number of sessions. This implies that a diagnosis of dementia may function as a catalyst, prompting patients and their caregivers to pursue and utilize healthcare services via the patient portal (Gleason et al., 2023).

Nahm et al. (2020) performed a randomized clinical trial to evaluate patient portal use among older adults in the United States (US). Their research specifically targeted older adults with chronic diseases. According to the researchers, “About 80% of older adults have at least one chronic disease, and 77% have at least two” (Nahm et al., 2020). Patient portals have been shown to be beneficial to all patients seeking medical care, especially those managing a chronic disease. The basis for the study was to improve outcomes for patients with chronic diseases through improving the use of the patient portal.

Data was collected primarily through an online survey. Other sources to access the survey were available: eNewsletters, Facebook, and flyers with directions to the study’s website. The survey was available for six months. Participants were required to be at least 50 years of age, have at least one chronic disease, have access to the internet, have the ability to read and write English, and be a US citizen. The sample included 272 older adults from twenty-nine different states in the US (Nahm et al., 2020).

Of the 272 older adults, 70.2% were female, and 29.8% were male. The average age of participants was seventy. The majority of participants ($n = 230$, 84.6%) stated they were offered patient portal accounts by their healthcare provider. A total of fifty-five participants stated that they received no instructions regarding the patient portal. A total of twenty-three participants stated that they received minimal instructions regarding the patient portal. A total of twelve participants stated that they received instructions that were confusing. Only five participants stated they received instructions regarding the patient portal, which was helpful (Nahm et al., 2020).

Nahm et al. (2020) provided insight into the purpose of our research study. Active participation in this research study by older adults reflects their increasing desire to become more proficient in utilizing patient portals. Older adults' desire to utilize patient portals is increasing; however, the challenges in using the patient portal are not improving. Specifically, Nahm et al. (2020) identified the need for appropriate patient portal training for the older adult population. To improve patient outcomes and patient satisfaction, patient portals must be improved, and healthcare providers must be prepared to properly educate patients, especially those managing chronic diseases.

Zhong et al. (2020) conducted an observational study to assess which patient portal functions had the highest usage rates and how patient's usage of the patient portal affected their office visit. The researchers identified three hypotheses for their study. The first hypothesis stated that patients who utilized the messaging function of their portal to chat with their provider were more likely to find the patient portal to be beneficial as opposed to patients who did not utilize this function. The second hypothesis stated that patients who used the appointment function on their portal to manage their appointments

were more likely to attend their appointments. The third hypothesis said that each patient values different portal functions over another based on various characteristics.

This study was conducted in a primary care clinic associated with the University of Florida (UF) Health. The research occurred quarterly over three years, from July 1, 2013, until June 30, 2016. The inclusion criteria for the study sample were insured adults over 18 years old who identified UF Health as their primary care provider, those who had been a patient before the start of the study, and those who remained a patient until the study concluded. Participants' demographic characteristics and chronic health problems were gathered using their patient portal. The research was conducted with two main themes. The first was focused on portal functions. The four functions chosen were messaging, laboratory, medication, and appointment. The second central theme researched was evaluating the correlation between patient portal usage and appointment attendance. The four categories chosen to evaluate appointment attendance were: arrived, canceled, no-show, and telephone encounters (Zhong et al., 2020).

The study concluded that messaging was the most frequently used portal function, succeeded by laboratory, appointment, and medication. Patients with multiple comorbidities were found to use their portal more often than those with fewer chronic diseases. Patients with a higher utilization rate of the messaging and laboratory portal functions also had higher appointment attendance rates. Patients who used their portal were less likely to be a no-show at their appointment than those who never used it. Overall, the researchers concluded that using patient portals effectively promoted high appointment attendance and reduced no-shows (Zhong et al., 2020).

Summary

After conducting the literature review, the researchers compared all relevant studies. They found that previous researchers who explored electronic patient portals all found them to be beneficial for both patients and providers. A few articles stated that patients who used their portal had better appointment adherence in comparison to those who did not use their portal (Zhong et al., 2020). Many studies found the patient portals to be beneficial to patients in their disease management (Saif et al., 2022). All relevant studies also included older adults as a population of interest. Older adults were found to be capable of using the portals when advised about them. The research team used this research to validate the need for this study and develop research questions and gaps in knowledge to be explored.

CHAPTER III

Methodology

This research study aimed to identify barriers affecting older adults' use of the patient portal and to determine how it impacted perceptions of healthcare quality in rural Mississippi. Patients who have healthcare providers offering patient portals are encouraged to utilize the patient portal; however, specific challenges can deter older adults. Once these barriers were defined, the researchers proposed hypotheses and research questions to assess these barriers and improve the use of the patient portal in older adults. This research study will benefit primary care providers in guiding future efforts toward increasing patient portal use and improving the perceived quality of care and patient empowerment. Using Pender's Health Promotion Model as a theoretical framework, the researchers developed a descriptive quantitative study. This was an appropriate design given the time constraints to gather data, as quantitative data can be obtained by a questionnaire more expeditiously.

Design of the Study

This research study used a descriptive quantitative design with convenience snowball sampling. The inclusion criteria for the analysis required participants to be older than sixty-five. A survey was created to evaluate barriers to patient portal use and perceived quality of care. The survey was composed of fourteen questions. Demographic data was also obtained, including the patient's age, sex, and race. Five researchers distributed surveys throughout rural Mississippi communities. The surveys were available at two primary care clinics, at community events, and at faith-based organizations in rural Mississippi communities. Among the primary care clinics, the clinic representative

signed a letter of informed consent. The surveys were available from March to May of 2024. After this time frame, the surveys were collected for data analysis. Data from the survey was compiled using descriptive and inferential statistics to report the study's findings.

Setting

This study took place in North Mississippi. The surveys were distributed within rural communities through community events, faith-based organizations, and two primary care clinics. One was a privately owned clinic located in north Mississippi, and the other was a publicly owned clinic located in central Mississippi. Both primary care clinics had access to electronic medical records and patient portals.

Population and Sample

A convenience sample was utilized to obtain a goal of five hundred surveys. The sample included older adults from two healthcare clinics in rural Mississippi, community events, and faith-based organizations in five communities across the state of Mississippi. The target population for this study was adults aged 65 years and older.

Methods of Data Collection

After obtaining approval from the Mississippi University for Women Institutional Review Board (IRB), two hundred surveys were distributed at each of the two primary care clinics. The receptionist at each clinic received the questionnaire, which was handed out to those who met the age criteria during check-in. The survey was returned to the receptionist and placed in an envelope before checking out. The survey was conducted in the clinic during the entire data collection time frame.

The five researchers planned to distribute and collect twenty additional surveys within the community for a potential sample size of five hundred participants. The survey was also handed out at faith-based organizations and community events by the researchers and collected by the researchers after completion.

Each participant was given a manilla envelope upon arrival at their scheduled appointments with their primary care clinic or by the researchers distributing the survey within the community. The envelope contained information about the research project, informed consent, and a paper survey questionnaire. Completion of the survey served as the patient's informed consent. Anonymity and confidentiality were maintained, and all data were securely stored and protected to ensure privacy and data security.

This method was used to administer a structured questionnaire to a sample of approximately five hundred older adults in two different primary care clinics and among rural communities in Mississippi. It consisted of fourteen questions about participants' general demographics, knowledge, use, and barriers to the use of patient portals. The research design and data collection process were conducted in line with the study's objectives and research questions.

Methods of Data Analysis

At the conclusion of data collection, patient surveys were retrieved from clinics and individual data entered into the *Qualtrics Survey Platform*. Once data entry was concluded, it was exported into an Excel spreadsheet and securely sent to a statistician for formal analysis. The statistician analyzed the data using the software SPSS. Relationships and correlations were explored between demographics, EHR use, and healthcare satisfaction.

Upon completing this research study, the researchers plan to disclose their findings with the clinics where data was obtained. They plan to share the data, research outcomes, and any recommendations that may be beneficial in increasing patient portal usage. The researchers plan to write to each clinic expressing their gratitude for helping obtain data. No incentives were offered to the clinics for assisting with data collection.

Summary

In conclusion, the researchers obtained data from adults aged 65 years and older. The researchers obtained data using a questionnaire handed to participants by the receptionist at each clinic. The researchers also distributed surveys among the community and collected the survey after completion. Data was collected over three months and then analyzed by a statistician. After analyzing the data, the researchers reviewed the results to identify similarities and disparities as well as to draw conclusions and propose solutions.

CHAPTER IV

The purpose of this study was to identify barriers affecting older adults' use of a patient portal and determine how it impacts their perception of healthcare quality in rural Mississippi. The implementation of EHRs has transformed healthcare delivery, improved data access, and changed communication among healthcare providers. The older adult population faces unique challenges, including limited technological literacy, cognitive impairments, and varying levels of trust in technology, which can impede their ability to fully experience the benefits of EHR use (Park et al., 2020). The results of this study are essential to implement targeted interventions to enhance EHR utilization for older adults. The remainder of this chapter presents the statistical findings from the research study on EHR use among older adults.

Participant Characteristics

The researchers collected data using physical copies of surveys completed by participants. The data was collected in a setting comprised of two clinics and multiple community locations across Mississippi. Location A was a privately owned clinic located in north Mississippi, Location B was a publicly owned clinic located in central Mississippi, and the remaining surveys in Location C were completed within five Mississippi communities. The researchers manually entered the data representing each location into the *Qualtrics* survey platform for digital use of the data. A convenience sample of 166 participants aged 65 years and older was used for analysis. Three demographic questions explored the participant's age, gender, and race. The findings displayed that the majority of the population consisted of adults aged 65 to 69 who were primarily female. Interestingly, the participant race was evenly distributed among

Caucasians and African Americans. A complete demographic summary is illustrated in Table 1.

Table 1

Demographic Summary of Survey Participants

Demographics	<i>n</i>	%
Location of survey		
Location A	80	48.2
Location B	22	13.3
Location C	64	38.6
Participant age		
65-69	63	38.0
70-74	38	22.9
75-79	33	19.9
80-84	14	8.4
85-89	10	6.0
90-94	8	4.8
Participant gender		
Male	76	45.8
Female	90	54.2
Participant race		
White	79	47.6
Black or African American	85	51.2
Hispanic or Latino	0	0
Asian	0	0
Other	2	1.2

Note. *N*=166, No value could be accounted for Hispanic/Latino or Asian race.

Survey Data

A total of five hundred surveys were printed to obtain data. Two hundred surveys were distributed at Location A, and eighty were completed. Two hundred surveys were distributed at Location B, and twenty-two were completed. The remaining one hundred surveys were distributed evenly amongst the five researchers. Each researcher distributed surveys to their local community. Sixty-four of the one hundred community surveys were completed. The total number of surveys completed and returned to the researchers were 166 (N=166) making the response rate 33.2%.

Primary Care Provider Data

The participants were asked if they had a primary care provider. Only two answers were given: yes or no. Figure 1 illustrates these responses. Out of 166 participants, 147 (88.6%) participants answered “yes,” while 17 (10.2%) participants answered “no.” Participants were also asked about the frequency of visits to their primary care providers. Figure 2 illustrates the responses to this survey question, with the most common response being “2 times a year.”

Figure 1

Participants With a Primary Care Provider

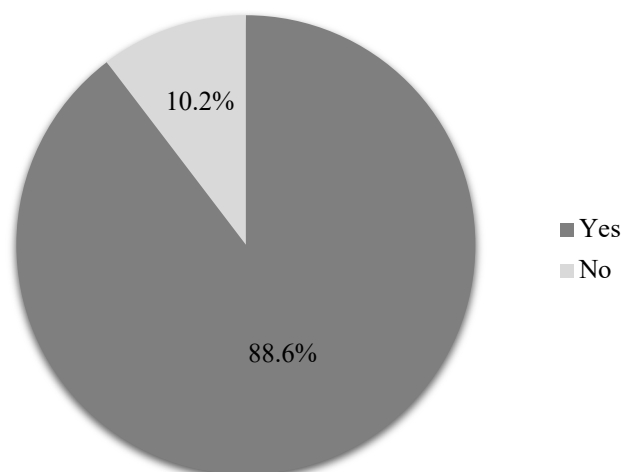
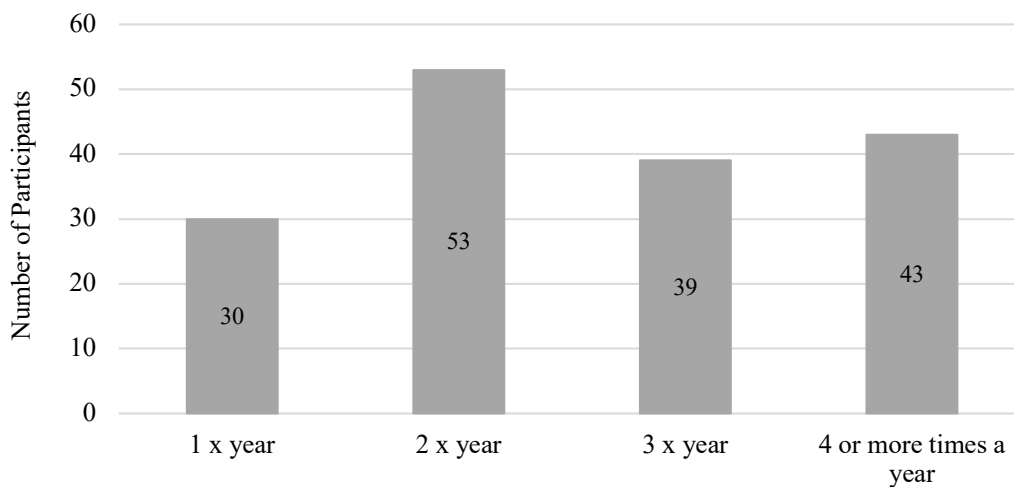


Figure 2

Frequency in Which Participants Visits Their Primary Care Provider



A crosstabulation was performed to compare progressive aging and the frequency of visits with their primary care provider. The most frequently chosen answer was “2 x year,” indicating that the majority of participants visit their primary care provider on average two times a year. This answer was highest among those aged 75-79 (39.4%) years. A pattern was discovered between aging adults and increased frequency of visits. The highest reported visit of four or more times a year was reported by adults aged 90-94 (37.5%). Table 2 illustrates the crosstabulation of age categories compared to the frequency of primary care visits.

Table 2*Crosstabulation of Age Categories and Frequency of Primary Care Visits*

	Age categories in years						Total
	65-69	70-74	75-79	80-84	85-89	90-94	
Frequency of visit with PCP							
1 x year	29.0	15.8	9.1	7.1	20.0	0	18.2
2 x year	29.0	28.9	39.4	35.7	30.0	37.5	32.1
3 x year	16.1	23.7	30.3	35.7	30.0	25.0	23.6
4 or more times year	25.8	31.6	21.2	21.4	20.0	37.5	26.1

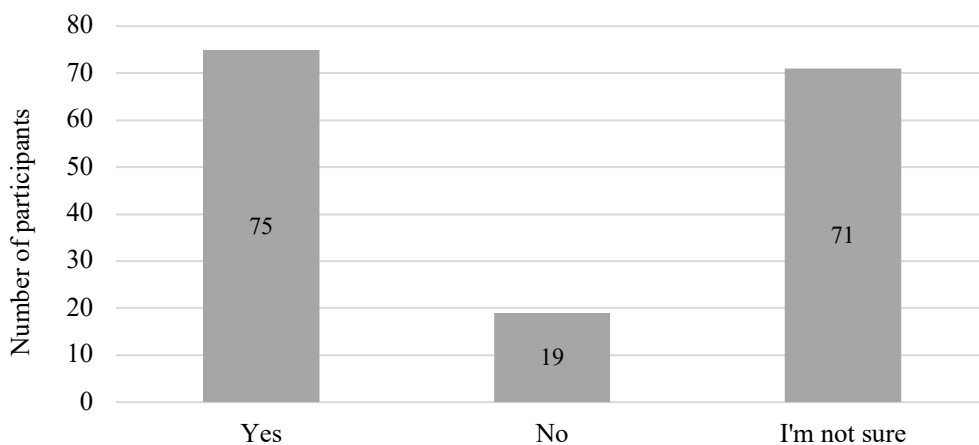
Note. PCP = primary care provider. Values displayed are percentages of the subject population of 166. No value could be accounted for in the 90–94-year category on seeing their PCP once a year.

Patient Portal Data

The participants were asked various questions about patient portal use within the survey. The first patient portal question asked if participants' PCP offered a patient portal. Of the 166 participants, 75 (45.2%) stated that their PCP did offer a patient portal, while 19 (11.4%) stated that their PCP did not offer a patient portal. Seventy-one (42.8%) participants expressed that they were unsure if their PCP offered a patient portal. These findings are illustrated in Figure 3. Participants were also asked if they had ever accessed their patient portal. Of the sample, 37 (22%) participants answered "yes," and 77 (47%) answered "no," while 51 (31%) answered "I'm not sure."

Figure 3

Does Your Primary Care Provider Offer a Patient Portal?



Specific questions were included in the survey to elicit potential barriers to patient portal utilization. The survey question “Do you have access to the Internet via Wi-Fi, Cellular Data, Fiber, Dial-up, or public internet?” was compared to the question “Are you comfortable using technology, such as a smartphone, iPhone, tablet, iPad, laptop, or computer?” The researchers concluded that the majority of participants (64.4%) have access to the Internet, and the majority of participants are comfortable using technology (47.9%). These statistics indicate that internet access is not a major barrier to patient portal access for this sample of older adults. Even though the majority answered that they were comfortable using technology, it was not specifically addressed if they were comfortable learning new programs and applications, such as a patient portal. The question referenced the ease of using general technology. A technology naïve patient may have difficulty navigating new programs even though they are comfortable with their current technology. A total of 52.1% of participants answered either “no” or “I’m not sure” when asked about comfort using technology. For this reason, comfort using

technology was concluded to be an identified barrier. Survey question thirteen asked participants to select any of the following barriers that prevent them from accessing their patient portal. They were allowed to choose none or all answer choices. Of the 166 participants, 48 (25.4%) selected “I did not know I had a patient portal,” 18 (9.5%) selected “I do not know how to access/use my patient portal,” 78 (41.3%) selected “I would rather talk to someone on the phone,” and 37 (19.6%) selected “I feel uncomfortable with my medical records being online”. The findings of these three questions are displayed in Table 3.

Table 3

Reported Barriers to Patient Portal Usage

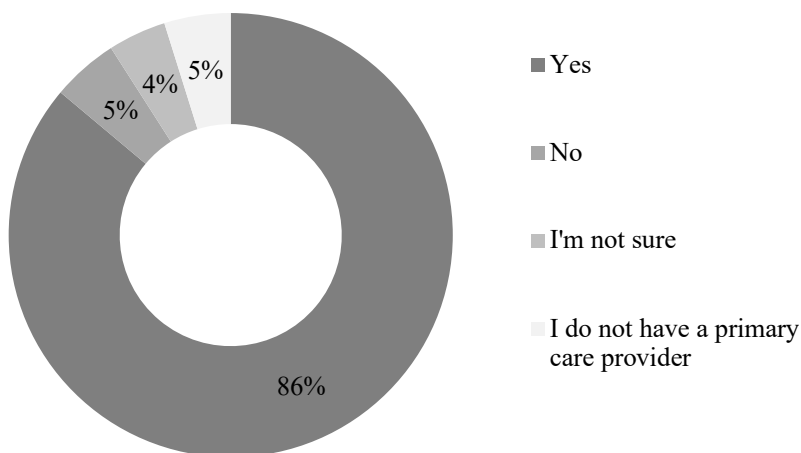
Measured Barrier	<i>n</i>	%
Access to internet		
Yes	105	64.4
No	35	21.5
I’m not sure	25	14.1
Comfort with using technology		
Yes	79	47.9
No	63	38.2
I’m not sure	23	13.9
Barriers to using patient portal		
I did not know I had a patient portal	48	25.4
I did not know how to access or use my patient portal	18	9.5
I would rather talk to someone on the phone	78	41.3
I feel uncomfortable with my medical records being “online”	37	19.6

Note. *N*= 166

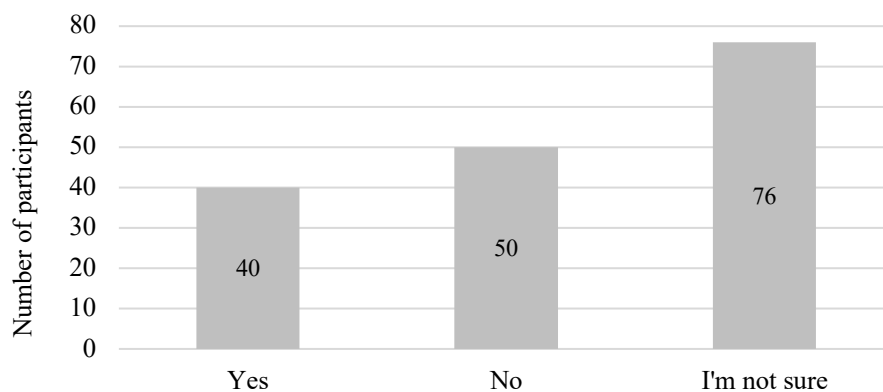
When participants were asked if they were satisfied with their PCP, the majority (86%) reported being satisfied. Figure 4 displays the response to this survey question.

Figure 4

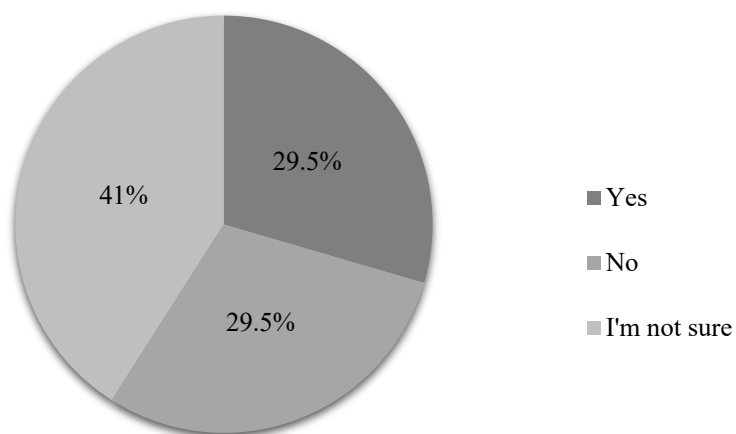
Patient Satisfaction with Their Primary Care Provider



Participants were asked to answer the question, “If your primary care provider does NOT offer a patient portal, do you think you would use a patient portal for any of the following functions: Schedule an appointment, message your provider, request a medication refill, view laboratory or imaging results?” 76 participants (45.8%) answered “I’m not sure,” while 40 (24.1%) answered “yes” and 50 (30.1%) answered “no”. Figure 5 illustrates participants’ responses to this survey question.

Figure 5*Projected Use of Patient Portal for Specified Functions*

Participants were asked if they feel that having quick access to their health records via the patient portal would lead to higher satisfaction with their healthcare experience. Of the sample, 49 (29.5%) responded with “yes,” 49 (29.5%) responded with “no,” and 68 (41%) responded with “I’m not sure.” Therefore, it was concluded that the majority of the sample (70.5%) were either unsure or decidedly not convinced that using a patient portal would lead to higher satisfaction with their healthcare provider. Figure 6 illustrates the findings of this survey question.

Figure 6*Access to Patient Portal and Associated Stance Towards Healthcare Experience*

The researchers included questions in the survey to ascertain the number of chronic health conditions each participant experienced. The findings displayed in Table 4 depict that the majority (31.9%) of participants reported having two active chronic health conditions.

Table 4

Quantitative Analysis of Participant's Chronic Health Conditions

Chronic health conditions	<i>n</i>	%
0	28	16.9
1	44	26.5
2	53	31.9
3	25	15.1
4 or more	16	9.6

Note. Participants were given a list of common chronic health conditions and asked to choose a number representing the number of chronic health conditions they had been diagnosed with. N=166.

Incidental Findings

The researchers included questions in the survey that were not directly used to answer the research questions or hypotheses but gave more insight into the population. Patterns and interesting data were revealed by these questions and are incidental to the research itself. For instance, 90% of the sample reported having a PCP, the average number of PCP visits per year was two, and most were satisfied with the care their PCP gave. Most (64.4%) of the sample had access to the internet but only approximately half (47.9%) were comfortable using it. Interestingly, the frequency of PCP visits increased with age. Regarding patient portal use, almost half (45.2%) of the sample were uncertain

if they had a patient portal or if they had ever used one. In this sample, the uncertainty increased with age.

Statistical Analysis

A crosstabulation and chi-square test were performed to elicit a correlation between patient satisfaction and patient use of an EHR. The variables were nominal; therefore, the hypothesis was tested with a Chi-square test. The test revealed the results were not statistically significant at the 95% confidence interval ($\alpha = 0.05$, $df = 6$, $r = 8.9$, $p\text{-value} = .177$). This data is displayed in Table 5 and Table 6.

Table 5

Primary Care Provider Satisfaction and Patient Portal Access Crosstabulation

	Have you ever accessed your patient portal?		
	Yes	No	I'm not sure
Are you pleased with the care you receive from your PCP?			
Yes	89.2	89.5	80.4
No	2.7	5.3	5.9
I'm not sure	8.1	0	7.8
I do not have a PCP	0	5.3	5.9

Note. PCP = Primary care provider, values are expressed in percentages.

Table 6*Chi-Square Test Results*

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	8.931 ^a	6	.177
Likelihood Ratio	13.201	6	.040
Linear-by-Linear Association	1.863	1	.172
N of Valid Cases	164		

a. 9 cells (75.0%) have expected count less than 5. The minimum expected count is 1.58.

Summary of Findings

The first research question of the study examined whether older adults utilize the EHR at their primary care provider's clinic. The participants who reported having a PCP were separated into a new data set. Of 147 participants who reported having a PCP, 72 (49%) reported that their PCP offered a patient portal. Only 14 (9.5%) responded that their PCP did not offer a patient portal; however, 61 (41.5%) reported that they were unsure. To further address this research question, a crosstabulation compared answers to survey question seven, "Does your primary care provider offer a patient portal?" and survey question eight, "Have you EVER accessed your patient portal?" Among the 72 participants who reported having a PCP and their PCP offering a patient portal, less than half (45.8%) reported ever accessing their patient portal.

The second research question of the study examined if there was a comparison between patient satisfaction and the use of the EHR. The null hypothesis was that there would be no association between patient satisfaction and the use of the EHR. The

alternative hypothesis was that there would be an association between patient satisfaction and the use of the EHR. It was concluded that in this sample population, there was no association between the use of EHR and patient satisfaction.

The third research question of the study examined the reported barriers to EHR use in older adults. Participants were instructed to “Please select any of the following barriers that prevent you from accessing your patient portal.” Participants had the option to select none or all four of the barriers listed. Of the 166 participants, eight did not mark any barriers. The most common barrier reported, with 47% of participants choosing it, was “I would rather talk to someone on the phone.”

A crosstabulation was performed to compare the results of question seven and question nine. Question seven asked, “Does your primary care provider offer a patient portal?” and question nine asked, “If your primary care provider does NOT offer a patient portal, do you think you would use a patient portal for any of the following functions: Schedule an appointment, message your provider, request a medication refill, view laboratory or imaging results?” Of the 75 (14 + 61) participants with a PCP who reported no available patient portal or were unsure if their provider offered a patient portal, only 10 participants (13.3%) reported they would use a patient portal for the listed tasks.

A crosstabulation was performed to delineate a comparison between adults of varied ages and the frequency with which they visited their PCP. The most frequently reported visit schedule was two times a year (32.1%). There was a comparison between progressively aging adults and increased frequency of visits. The highest reported visit interval of four or more times a year was most often reported by adults ages 90-94 years old (37.5%).

CHAPTER V

The purpose of this study was to identify barriers affecting older adults' use of the patient portal and determine how it impacts their perceptions of healthcare quality in rural Mississippi. Knowledge of these barriers will provide direction for optimizing patient portal use in the older adult population in Mississippi.

With the transition to electronic medical records over the last decade, technology is being infused into daily life. Use of the EHR can be beneficial in helping manage chronic conditions. Over two-thirds of older adults have at least one chronic condition (Nahm et al., 2020). Research by Newman et al. (2020) showed that the elderly benefitted most from using patient portals yet only about 10% of adults over age 65 successfully used them. The purpose of this research was to determine whether older adults utilize EHR, if there was a correlation between use and patient satisfaction and which barriers hindered older adults from utilizing the EHR.

The team used Nola Pender's Health Promotion Model (HPM) as the theoretical framework to guide their research. The HPM was founded on Pender's belief that the goal of nursing was to help people care for themselves across the lifespan. This emphasized the importance of patients being active participants in their health and health-promoting behaviors. Although it can be more challenging, utilization of patient portals is a primary means for older adults to be involved in their healthcare.

Alligood (2022) delved further into how technological advances relate to the HPM by stating, "This model fosters thinking about future opportunities and influences the use of technological advances, such as the electronic health record, as a means to achieve prevention and health promotion". The HPM was an ideal choice for this

research because the foundation of the study was whether patients were taking an active role in their healthcare by use of patient portals. The researchers sought to isolate barriers that affected EHR use as a means to support positive change and improve patient outcomes.

The researchers identified three questions to guide the study of barriers affecting older adults' utilization of electronic health records (EHR) and their effects on clinical visits:

1. Do older adults utilize an EHR at their primary care provider's clinic?
2. Is there a correlation between patient satisfaction with their PCP and the use of EHR?
3. What are the reported barriers to EHR use among older adults?

The remainder of the text will explain and interpret the questionnaire results. The research findings will also be discussed and compared to results of related literature. The study's limitations and overall conclusions will be examined. Finally, recommendations for future research will be listed.

Discussion of Findings with Conclusions

In this study, five hundred surveys were distributed. Two primary care clinics in Mississippi each received two hundred surveys. The one hundred remaining surveys were evenly distributed in the community. A total of 166 surveys were completed. The population consisted of adults 65 years old and older. The largest percentage of respondents were aged 65-69 with 38% (63). More females 90 (54.2%) completed the questionnaire than males 76 (45.8%). Most participants identified as Black or African American (n=85, 51.2%) and White (n=79, 47.6%). Over half, (n=94, 56.6%) had two or

more chronic health conditions. Over 60% of participants aged seventy-five and older had two or more health problems.

Regarding primary care providers, 147 (89.6%) participants had a PCP compared to 17 (10.4%) who did not. Of these participants, 43 (26.1%) saw their provider four or more times per year, 39 (23.6%) went three times, 53 (32.1%) went twice per year, and 30 (18.2%) went once per year. Most respondents (86.1%) said they were pleased with the care they received from their primary care provider. Of those who completed the questionnaire, 75 (45.5%) stated their provider offered a patient portal compared to 19 (11.5%) that did not. Almost half of the participants, 71 (43%), were unsure if their provider offered a patient portal. Over half of those aged 65-69 (54.8%) and 75-79 (57.6%) stated their provider did offer patient portals. In this sample, the uncertainty of a patient portal increased with age.

Thirty-seven respondents, (22.3%) stated they had accessed their patient portal before compared to 77 (46.4%) who stated they did not. Fifty-one participants (30.7%) were unsure if they had accessed their portal or not. Those who reported not using or accessing the portal increased with age: 65-69 (9.0%), 70-74 (7.9%), and 80-84 (21.4%), 85 – 89 (40%), 90 – 94 (12.9%). Of those whose provider did not offer a portal, 40 (24.1%) said they would use one if it were available compared to 50 (30.1%) who would not and 76 (45.8%) who were unsure. Of all participants, the same percent, 49 (29.5%) felt the satisfaction rate would be higher, as did those who thought access to patient portals would not lead to a better healthcare experience 49 (29.5%). Sixty-eight (41%) participants were unsure if it would affect their healthcare experience.

Regarding barriers, most respondents 105 (63.3%) had access to the Internet compared to 58 (35.5%) who did not or were unsure. Almost half 79 (47.9%), stated they were comfortable using technology compared to 63 (38.2%) who were not or who were not sure 23 (13.9%). When asked about specific barriers to patient portal use, most participants 41.3% (78) would rather talk to someone on the phone, followed by those who were unaware they had a patient portal 48 (25.4%).

Contrary to a study conducted by Saif et al. (2022), the data revealed that almost half 33 (45.8%) of adults over the age of sixty-five who had a primary care provider that offered a patient portal utilized it. This could be because patient education has improved regarding patient portals, or it could also be because more providers offer patient portals.

In this sample, no significant correlation was found between EHR use and patient satisfaction. This finding was contrary to a study by Cross et al. (2021) that found that moderate portal users were the least satisfied with their healthcare. Regarding barriers to patient portal usage, similar to a study conducted by Park et al. (2020), the most commonly reported barriers were the desire to talk to someone in person (n=78, 41.3%), lack of knowledge of a patient portal (n=48, 25.4%), and privacy and security (n=37, 19.6%).

Limitations

There were several identified limitations of the study and some barriers which could not be modified. Limitations of this study regarding the use of electronic health records among older adults in primary care included the following:

1. The location of the study was limited to two clinic sites and five communities.
2. A limited number of survey participants.

3. A low response rate at one of the primary care clinic sites.
4. Time constraints in which the study was conducted under.
5. Reliability and validity of the survey utilized.
6. Possible hindrance of the older population completing the survey during health care visits.
7. Capability or willingness of studied population to learn new technology applications such as an EHR.

The selection of the study location was crucial. Two primary healthcare clinics in Mississippi and the surrounding areas of the five researchers were chosen. This decision allowed for the data to be generalized to represent the older population across rural Mississippi since community sites were included. The researchers strategically chose to focus on small clinics instead of larger corporations due to time constraints. This choice was influenced by the limited time available to obtain approval and distribute questionnaires. The researchers believed that collecting questionnaires from smaller clinics would yield a more representative population sample.

When assessing barriers to patient portal usage, one identified barrier was that almost half (42.8%) of participants were unaware if their PCP offered a patient portal. This modifiable barrier could increase patient portal usage rates, reduce appointment tardiness, and improve patient compliance with disease management. Participants who answered that they did not have a patient portal or did not know if their PCP offered a patient portal were not filtered out or asked to skip the succeeding questions about accessing the patient portal. This omission likely caused the data to be inappropriately skewed, thus rendering survey question eight, "Have you ever accessed your patient

portal?” invalid data. If this study were to be repeated or remediated, it would be recommended to ask participants who answer ‘no’ when asked if they have a patient portal or knowledge of one to skip the succeeding questions about the utilization of the portal.

Another constraint of this study was the limited number of survey participants. Due to the sixty-five and older age inclusion criteria, the study only included survey results from 166 individuals. The researchers were acutely aware of this limitation and its potential impact on the study's findings. Given the age of interest, another limitation was the possible difficulty completing the survey due to limited knowledge of EHR. Thus, paper surveys were used to gather data. The researchers developed the survey with the older generation in mind. The current survey did not inquire about education level or assistance with completing the survey. Although these are not limitations, they could offer more insight into the barriers that hinder older adults from utilizing EHRs.

The survey tool did not account for or assess the participants capability or willingness to learn new technology applications such as an EHR. This is accounted for as a barrier because participants who have access to their EHR may not be comfortable or know how to access it. The survey question only asked participants if they were comfortable using existing technology such as a smart phone, iPhone, tablet, iPad, laptop, or computer, it did not assess their willingness or desire to learn a new function with the described benefits.

The researchers concluded that this study identified several barriers preventing older adults from utilizing EHRs. The research outcomes support the barriers to EHRs found in previous studies. The conclusion was that most older adults preferred to talk

with someone on the phone. However, the study could not identify correlations between patient satisfaction and the use of an EHR. Barriers identified during the research indicate the participants knew how to utilize or navigate the EHR. The older population needs education on the benefits of EHR, and those who prefer not to have medical records electronically should have a trial to see how they would adjust to the change. This research reflects that the majority prefer not to have their medical records available online and prefer to talk with someone on the phone. According to the research findings, older adults may have increased portal usage if they received education regarding EHRs. An excellent understanding of why the older population does not utilize EHR for health care information allows the provider to know whether it makes their health care visits and concerns.

Implications

The study's findings significantly impact nursing practice, particularly enhancing patient engagement and self-management among older adults through EHRs. Utilizing Nola Pender's Health Promotion Model, the study highlights the importance of perceived benefits, self-efficacy, and personal behavior in influencing the adoption of health-promoting activities. Healthcare providers can use these insights to design and implement strategies that enhance older adults' confidence and perceived usefulness of EHRs, thereby improving health outcomes and patient satisfaction. Future research can further evaluate and expand this model by including healthcare provider support, which may also play a critical role in adopting EHRs. The study was conducted in rural Mississippi, and it is crucial to focus on educational interventions and support systems that address the specific barriers older adults face when using EHRs.

The theoretical framework guiding this study was found to be appropriate for understanding the factors influencing EHR use among older adults. The results support that technological familiarity and perceived ease of use are critical factors in adopting health technologies. Future research could build on this framework by exploring socio-economic status, previous technology use, and specific health conditions. Future research should focus on assessing the long-term impact of increased EHR usage on health outcomes and patient satisfaction. Future research could develop interventions to reduce barriers to EHR adoption among older adults, such as implementing additional education for older adults at each visit or encouraging personalized technical support at home.

Educational programs for nurse practitioners should incorporate training on effectively engaging older patients with EHRs. This includes strategies for teaching patients about the benefits and functionalities of patient portals. The findings from this study emphasize the necessity for educational interventions to enhance the use of EHRs among older adults.

Recommendations

Based on the results of this study, recommendations were made for clinical practice and for future research. In clinical practice, the following recommendations were made:

1. Healthcare providers could routinely discuss the benefits and uses of EHRs with their patients to reinforce this service and encourage its use.
2. Providers could also integrate patient portals into the standard care process, such as scheduling appointments, accessing lab results, and managing medications.
3. Primary care clinics could provide a computer in the waiting area that patients could utilize while waiting to see their PCP.

4. Along with adding computer availability, clinics could employ a staff member to help patients access their patient portal on the provided computer or their personal device if available. This staff member could also provide direct education on patient portal use.
5. Clinics could provide educational material for patients to take home to reinforce education provided during their visit about patient portal use.

In future research, the following recommendations were made:

1. Future research could have a larger and more diverse sample size to improve the validity and generalizability of the findings.
2. Clinic staff members could encourage patients to participate in the survey and explain the importance of the survey to improve their healthcare experience.
3. Researchers could include questions on the survey tool to assess participant's level of education and include this as a potential barrier for accessing the EHR.

These recommendations for clinical practice and future research aim to address the gap between the accessibility of EHRs and their utilization by older adults, which can lead to improved healthcare outcomes and patient satisfaction in this population.

Conclusion

In conclusion, this research study identified several barriers preventing older adults from utilizing EHRs, including limited awareness of patient portals and a preference for phone communication over digital platforms. The study also highlighted the need for further investigation due to the limitations of this study. While the research outcomes supported barriers found in previous studies, there is still a need for additional research and interventions to address the identified limitations and barriers. Overall, this

study provides valuable insights into the challenges and preferences of older adults in utilizing electronic health records.

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APPENDIX A
IRB APPROVAL

DATE: February 14, 2024

TO: Dr. Renea Hopple

FROM: Dr. Candy Grant, IRB Chair *C.G.*

CC: Alianne Dearman, Kosheya Johnson, Santanna Nesbitt, Jessica Sullivan,
Hayden Trantum

Research Title: Electronic Health Record Use among Older Adults in Primary Care

The Mississippi University for Women IRB Committee has determined that your research is exempt under 45 CFR 46.101 (b)(4). The research obtains data using a survey and the identity of the human subjects cannot be readily ascertained.

If any changes are made to the study, the Committee must be notified. If the project is still running twelve months after the date of this memo, please be advised that we will need an update for our files.

Best wishes with your research!

APPENDIX B
LETTER OF INFORMED CONSENT

To Whom It May Concern:

We are graduate students in the Family Nurse Practitioner program at Mississippi University for Women in Columbus, Mississippi. As a program requirement, we are conducting a research study to evaluate barriers affecting older adults' use of the electronic health record and the impact of those barriers on primary care visits. To perform our study, a survey will be provided to patients above the age of 65. The survey will address demographic information, current personal use of the electronic health record, and potential barriers to utilizing the electronic health record.

We agree to undergo or consent to any HIPPA requirements set forth by your practice regarding patient privacy and confidentiality. The questionnaire will not include any patient identifiers. No clinic or patient identifiers will be used in the study.

Your participation in this study is strictly voluntary. You may withdraw your consent and participation in this study at any time. The result of the study will be made available to you upon completion and may be of beneficial use as a quality assurance measure for your practice.

If you have any questions concerning this study, please contact any of the following committee members: Alianne Dearman (769-798-2391), Kosheya Johnson (601-341-8945), Santanna Nesbitt (662-710-3118), Jessica Sullivan (662-295-1944), or Hayden Trantum (662-803-2895).

Sincerely,

Alianne Dearman, Kosheya Johnson, Santanna Nesbitt, Jessica Sullivan, and Hayden Trantum

I have read the above letter of consent and agree to the utilization of this clinic for the above-mentioned research project. I understand that HIPPA regulations will be strictly followed, and the confidentiality of each patient's information will be maintained. I also understand that the results of the study will be made available to me at the project's end.

Name, Title, Signature, Date

APPENDIX B
LETTER OF INFORMED CONSENT

To Whom It May Concern:


We are graduate students in the Family Nurse Practitioner program at Mississippi University for Women in Columbus, Mississippi. As a program requirement, we are conducting a research study to evaluate barriers affecting older adults' use of the patient portal and the impact of those barriers on primary care visits. To perform our study, a survey will be provided to patients above the age of 65. The survey will address demographic information, current personal use of the patient portal, and potential barriers to utilizing the patient portal.

We agree to undergo or consent to any HIPPA requirements set forth by your practice regarding patient privacy and confidentiality. The questionnaire will not include any patient identifiers. No clinic or patient identifiers will be used in the study.

Your participation in this study is strictly voluntary. You may withdraw your consent and participation in this study at any time. The result of the study will be made available to you upon completion and may have beneficial use as a quality assurance measure for your practice. If you have any questions concerning this study, please contact any of the following committee members: Alianne Dearman (769-798-2391), Kosheya Johnson (601-341-8945), Santanna Nesbitt (662-710-3118), Jessica Sullivan (662-295-1944), or Hayden Trantum (662-803-2895).

Sincerely,
Alianne Dearman, Kosheya Johnson, Santanna Nesbitt, Jessica Sullivan, and Hayden Trantum

I have read the above letter of consent and agree to the utilization of this clinic for the above mentioned research project. I understand that HIPPA regulations will be strictly followed, and the confidentiality of each patient's information will be maintained. I also understand that the results of the study will be made available to me at the project's end.

 3/8/24 CFNP/owner

Name, Title, Signature, Date

APPENDIX B
LETTER OF INFORMED CONSENT

To Whom It May Concern:

We are graduate students in the Family Nurse Practitioner program at Mississippi University for Women in Columbus, Mississippi. As a program requirement, we are conducting a research study to evaluate barriers affecting older adults' use of the patient portal and the impact of those barriers on primary care visits. To perform our study, a survey will be provided to patients above the age of 65. The survey will address demographic information, current personal use of the patient portal, and potential barriers to utilizing the patient portal.

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Your participation in this study is strictly voluntary. You may withdraw your consent and participation in this study at any time. The result of the study will be made available to you upon completion and may have beneficial use as a quality assurance measure for your practice. If you have any questions concerning this study, please contact any of the following committee members: Alianne Dearman (769-798-2391), Kosheya Johnson (601-341-8945), Santanna Nesbitt (662-710-3118), Jessica Sullivan (662-295-1944), or Hayden Trnum (662-803-2895).

Sincerely,

Alianne Dearman, Kosheya Johnson, Santanna Nesbitt, Jessica Sullivan, and Hayden Trnum

I have read the above letter of consent and agree to the utilization of this clinic for the above mentioned research project. I understand that HIPPA regulations will be strictly followed, and the confidentiality of each patient's information will be maintained. I also understand that the results of the study will be made available to me at the project's end.

Debbie Anjery, Director of Clinic Operations
Name, Title, Signature, Date
3/7/24

APPENDIX C
LETTER TO SURVEY PARTICIPANTS

Dear Potential Participant,

We are graduate students from Mississippi University for Women. We are contacting you for help with our research project that explores barriers that may affect older adults' use of electronic medical records. It would be of utmost importance if you could please provide us with a moment of your time to complete the attached survey. All responses and participants will remain anonymous. It will take approximately 5 minutes or less to complete the survey.

There is no *right* or *wrong* answer.

Please respond to each question/statement. If you have any questions regarding the survey or our research, please contact our principal investigator, Alianne Dearman (769) 798-2391 or

Dr. Renea Hopple, research committee chairperson (662) 415-1683.

Thank you for your participation.

Sincerely,

Alianne Dearman, Principal Investigator, Graduate Student

Kosheya Johnson, Investigator, Graduate Student

Santanna Nesbitt, Investigator, Graduate Student

Jessica Sullivan, Investigator, Graduate Student

Hayden Trantum, Investigator, Graduate Student

APPENDIX D
ELECTRONIC HEALTH RECORD SURVEY

*Thank you for participating in our study! Please do not write your name on this form.
There are 2 pages, please complete the entire survey to the best of your ability!*

The questions on this survey ALL pertain to patient portals used by your primary care provider, NOT patient portals that you may have accessed after being in a hospital. A primary care provider is a doctor or nurse practitioner who provides routine health maintenance for you.

For this survey, we are defining a patient portal as ANY electronic means to access your medical record, request medication refills, message with your primary care provider, schedule an appointment, and view recent laboratory and imaging results. A patient portal may also be referred to as any of the following: “MyChart,” “Healow App,” “Electronic Medical Record,” “Electronic Health Record,” and “Athena Health”.

Electronic Health Record Survey

1. What is your age? _____
2. What is your gender?
 - Male
 - Female
3. What is your race?
 - White
 - Black or African American
 - Hispanic or Latino
 - Asian
 - Other: _____
4. Do you have a primary care provider?
 - Yes
 - No
5. On average, how often do you see your primary care provider?
 - 1 x year
 - 2 x year
 - 3 x year
 - 4 or more times a year

6. Are you pleased with the care and service you receive from your primary care provider?
 - Yes
 - No
 - I'm not sure
 - I do not have a primary care provider
7. Does your primary care provider offer a patient portal?
 - Yes
 - No
 - I'm not sure
8. Have you EVER accessed your patient portal?
 - Yes
 - No
 - I do not have a patient portal
9. If your primary care provider does NOT offer a patient portal, do you think you would use a patient portal for any of the following functions: Schedule an appointment, message your provider, request a medication refill, view laboratory or imaging results?
 - Yes
 - No
 - I'm not sure
10. Do you feel that having quick access to your health records via a patient portal would lead to a higher satisfaction with your healthcare experience?
 - Yes
 - No
 - I'm not sure
11. Do you have access to the internet via Wi-Fi, Cellular Data, Fiber, Dial-up, or public internet?
 - Yes
 - No
 - I'm not sure
12. Are you comfortable using technology such as; a smart phone, iPhone, tablet, iPad, laptop, or computer?
 - Yes
 - No
 - I'm not sure

13. Please select any of the following barriers that prevent you from accessing your patient portal.

- I did not know I had a patient portal
- I do not know how to access/ use my patient portal
- I would rather talk to someone on the phone
- I feel uncomfortable with my medical records being “online”

14. How many of the following conditions have you been diagnosed with?

- 1 2 3 4 or more

- | | |
|--------------------------|--|
| - High blood pressure | - Cancer |
| - High cholesterol | - Chronic Obstructive Pulmonary Disease (COPD) |
| - Diabetes | - Cardiovascular disease |
| - Chronic kidney disease | - Stroke |
| - Obesity | - Dementia or Alzheimer’s |

