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Barriers To Telemedicine: Factors Influencing The Adoption Of Telemedicine

Carleton T. Brown
Prairie View A&M University

BARRIERS TO TELEMEDICINE:

FACTORS INFLUENCING THE ADOPTION OF TELEMEDICINE

A Dissertation

by

CARLETON T. BROWN

Submitted to the Office of Graduate Studies of
Prairie View A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF BUSINESS ADMINISTRATION

August 2024

Major Subject: Business Administration

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ABSTRACT

Barriers To Telemedicine:

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(August 2024)

Carleton T. Brown, B.S, University of Houston – Clear Lake; MBA, Northeastern University; MA, Naval War College; MS, The George Washington University

Chair of Advisory Committee: Dr. Robert Zinko

Telemedicine is a rapidly evolving health treatment capability that offers an efficient and cost-effective alternative to conventional medical care. Providing access to alternative medical treatment may mitigate the population's stress on the medical infrastructure in the upcoming decades. This study investigated the factors influencing patient adoption of telemedicine, including patient experiences and economic considerations. A quantitative survey explored patient population's intention to utilize telemedicine, focusing on factors influencing the patients' decision-making processes. Analyzing the survey results, the researcher focused on five main variables: exposure to telemedicine, age, loss of income, trust in doctors, and time lost. The research findings offer valuable insights into the potential consumption of telemedicine by the population, benefiting stakeholders in the healthcare industry, lawmakers, social workers, and community activists.

***Keywords*:** telemedicine, healthcare/health disparities, cost-effective, opportunity cost, trust in doctors, age

DEDICATION

I dedicate this dissertation to my Lord and Savior, Jesus Christ, through whom all things are possible. My Lord gave me the strength to accomplish my goal. My wife Erica and our children, Xavier, Arianna, Shia, and Amaya, provided the patience and understanding to allow me to complete my years of study. Your patience and support are and will continue to be valuable and appreciated. I hope that I have set an example for you to accomplish any goal you set for yourself. Strive to be more than you ever thought you could; I did.

To my great aunt Pricilla Webb and cousin Corey Jackson, thank you. Auntie, my entire life, you emphasized the importance of education when I did not understand its' value. Though you are not here to see this accomplishment, you have sowed the seeds of this harvest. It is not lost on me that you saw the possibility in all your nieces and nephews. Corey, there are so many things that I want to say, it is difficult to put them on paper without becoming emotional. I knew I could because of you. I do not want you to ever forget that. I saw the possibility because my little cousin dreamed and succeeded before me. I am eternally grateful for you igniting my petty drive.

Finally, to my military friends. Fellas, I made it. You kept me grounded and motivated. Never wasting an opportunity to remind me I am not special, but never preventing me from keeping my eye keenly focused on the job at hand. Appreciate ya!

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CHAPTER I

INTRODUCTION

Telemedicine

COVID-19 was the unfortunate wake-up call to the U.S. medical infrastructure, signaling that it must undergo a transition to meet society's urgent and future medical needs. Telemedicine emerged as the solution to a demoralizing pandemic that engulfed the globe and limited patient access to non-emergency care as medical facilities attempted to triage the most critical patients (Bird, 2021; Custer, 2020; Luo et al., 2021; Mann et al., 2020). As defined by the Health Resources and Services Administration, an agency of the U.S. Department of Health and Human Services:

> [T]elehealth—sometimes called telemedicine—is the use of electronic information and telecommunication technologies to provide care when you and the doctor are not in the same place at the same time. If you have a smart phone or a device with internet access, you already have everything you need to get medical care or services through telehealth—you are able to talk to your doctor live over the phone or video chat; send and receive messages from your doctor using chat messaging, email, secure messaging, and secure file exchange; and use remote patient monitoring so your doctor can check on you at home. For example, you might use a device to gather ECG or other vitals to help your doctor stay informed on your progress (*What is Telehealth?*, 2021, para. 2).

The World Health Organization acknowledges that the effective use of telemedicine can improve the quality of healthcare delivery and strengthen the healthcare industry in many nations through methods like e-learning, knowledge management, disease surveillance, epidemic response, and e-supported resource management (Nwabueze et al., 2009). Telemedicine is a

viable option to improve patients' medical outcomes and health disparities. The technology is a cost-effective alternative to in-person medical treatments and should be utilized to supplement standard medical care and to alleviate the stress on the limited medical infrastructure. Given the constraints of limited resources, providers must assess the advantages of telemedicine over the status quo and evaluate insurance providers' willingness to cover such services (Ruckdäschel et al., 2006).

Telemedicine's Impact on Health

An estimated 73 million baby boomers will reach the minimum Medicare age requirement of 65 by 2030. This gray tsunami will likely significantly burden the current healthcare system. It is unlikely that the system's ability to meet medical needs can be expanded without expanding telemedicine use. As the baby boomer generation ages, living longer with a growing array of chronic health conditions, there is an increasing demand for support among unpaid family members. AARP (formerly known as the American Association of Retired Persons) delineates various potential solutions, including the integration of telemedicine (Kriss, 2018). Shorter interactions, less travel, economies of scale, higher revenues, and shifting care components away from clinicians and toward technology or the patient themselves could all reduce costs (Snoswell et al., 2020).

Telemedicine provides diverse medical treatment options, encompassing primary care (Roine et al., 2001), stroke care (Gao et al., 2022; Joseph et al., 2022; Kjelle & Myklebust, 2022), rehabilitation (Wang et al., 2022), chronic disease management (Oksman et al., 2017), HIV care, rheumatology, prison outpatient care, oncology, and cancer care (Sirintrapun & Lopez, 2018), among others. The diverse treatment options broaden the utilization possibilities for patients in various communities.

Increasing the accessibility and quality of healthcare while decreasing costs is a potential positive impact of telemedicine. Telemedicine services integrated into daily clinical practices are more likely to be accepted by end-users when the service is familiar and has a financial benefit (Rho et al., 2014). With rising quality standards, a trend toward specialization, and the development of centers of excellence, telemedicine is becoming more common for inpatients and outpatients (Ruckdäschel et al., 2006). Users assess the advantages and disadvantages of the service with an informed opinion (Jansen-Kosterink et al., 2019).

Telemedicine's Impact on Finance

Identifying cost-effective ways to meet the medical needs of society has long been recognized by the medical community as a critical financial burden (Lin et al., 2018; Palmer & Raftery, 1999; Smith et al., 2003). Mehlman and Tamburri (2020) defined the challenge to the system thus: "as leaders of cash-constrained health systems prepare for the post-COVID-19 future, with its vision of virtual care woven into the fabric of the U.S. delivery system, they can achieve that vision only by pursuing a financially sustainable business model" (p. 30). Healthcare institutions are challenged to show that new technologies add value while keeping or even improving the quality of care in light of growing requirements to lower costs and improve care (Theodore et al., 2015). A survey sponsored by HFMA and CreditCare found that 83.7% of represented organizations increased their use of telehealth during the pandemic, with 71.6% working to improve online patient access (Bird, 2021).

By lowering economic barriers and boosting preventative care, the Affordable Care Act expanded coverage, aiming to improve health outcomes, and reduce health disparities by reducing affordability barriers and increasing preventive care (Ma et al., 2022). Preventive care is directly related to improved health outcomes. Additionally, racial discrimination or exclusion based on socioeconomic status and other historical factors have contributed to systematic health

disparities that have adversely affected marginalized groups who encounter substantial obstacles to procuring healthcare (Ma et al., 2022). Although there have been advancements in accessing prompt healthcare and a reduction in emergency department visits, disparities in comparison to White populations endure (Yee et al., 2022).

Approximately 50% of African American men between the ages of 20 and 34 in the United States either lack employment or earn an income below the poverty threshold for a four-person household (Jennings, 2014). They utilize healthcare at rates below those of their White counterparts from similar backgrounds (Ma et al., 2022). Improving access to healthcare is not the only thing that needs to be done to close the healthcare utilization gap that impacts a community's financial well-being. Social and cultural factors affect medical services among minorities and White patients (Ma et al., 2022).

Telemedicine promises to reduce healthcare costs while enhancing accessibility and quality (Jansen-Kosterink et al., 2019). Integrating telemedicine services into regular clinical practices, coupled with financial incentives, leads to greater acceptance among end users (Jansen-Kosterink et al., 2019; Rho et al., 2014). The success of telemedicine hinges on achieving positive financial outcomes for both patients and medical professionals, promoting health improvements, and ensuring widespread acceptance among end users (Al-Samarraie et al., 2020; Mehlman & Tamburri, 2020). End-user acceptance, representing the actual response of potential telemedicine service users, is a critical factor in determining the overall effectiveness of this healthcare approach (Harst et al., 2019).

Exploring the potential financial advantages of telemedicine offers a forward-looking perspective on the future of healthcare landscape (Zhong et al., 2018). A practical economic analysis should consider the comparative expenses borne by patients and medical providers,

aiming to enhance access to care and the efficiency of care delivery. This approach scrutinizes the costs associated with transactional tasks for both parties involved—the patients and the healthcare providers—as they engage in the necessary activities. As Theodore et al. (2015) suggested, such a method may present a more fitting and comprehensive alternative to traditional approaches.

Telemedicine offers the potential to expand or improve access for the general patient population, enhancing access to appropriate care and specialty services. The uses for telemedicine have significantly increased with technological advancement; examples include reminder systems to improve compliance, virtual diagnosis and treatment recommendations, emergency call systems, and even the monitoring of vital signs in patients with chronic illnesses, assisting in precarious situations (Ruckdäschel et al., 2006). Technology-based services arise from an innovation strategy, extensive research and development, and constantly changing initiatives that require a thorough comprehension of customers' readiness to adopt technology-based systems (Hossaina et al., 2017).

In response to the coronavirus pandemic, private insurers increased access to telemedicine by waiving cost-sharing for telehealth visits and increasing payments to telehealth providers. In addition, "Medicare waived restrictions on telemedicine services for Medicare Part B beneficiaries for as long as the emergency lasts" (Custer, 2020, p. 35). There is a need to better understand the financial incentives for healthcare providers to augment the current service arrangement with telemedicine.

Expected Contributions

When patients require an in-person visit with a physician, they must go through the process of scheduling an appointment, potentially taking time off from work, and enduring

lengthy wait times; however, the availability of technology for remote communication with their physician offers greater convenience for patients (Ivy, 2018). The accessibility of healthcare services is crucial for good care outcomes, and telemedicine plays a necessary role by enhancing accessibility and reducing barriers for a broad spectrum of users. Therefore, affording patients the comfort and privacy of their home to complete medical consultations minimizing disruptions to their daily lives.

While the anticipated benefits of telemedicine are well understood, telemedicine adoption rates remain relatively low (Luo et al., 2021), primarily due to patient hesitancy to substitute in-person visits with telemedicine (Luciano et al., 2020). Multiple models have been developed and applied to end-user acceptance theory over the past 30 years. Many researchers have sought to identify methods for evaluating and distinguishing characteristics of improved user acceptance (Davis et al., 1989). Although there are expansive technological advancements, telemedicine utilization is not universal, even among those who have access to it.

Despite the provision of telemedicine access through health insurance, individuals might be unaware of it as an option or unfamiliar with the process of accessing it. This highlights a potential gap in knowledge and awareness that warrants attention for optimizing the impact of telemedicine on healthcare outcomes. Telemedicine's core purpose is to improve individual and community health by preventing diseases, providing treatment, and educating healthcare providers (Hajesmaeel-Gohari & Bahaadinbeigy, 2021).

This study endeavored to understand the barriers affecting the adoption of telemedicine and analyze factors affecting the decision to use telemedicine as an alternative health treatment. These factors included familial experiences and the effects of economic paradigms on patient telemedicine usage choices. Highlighting considerations that insurance and medical practitioners

can discuss with patients to support their use of telemedicine and identifying where lawmakers and planners should direct federal, state, and local dollars to improve community health outcomes, this study aimed to further the knowledge of the field.

The research aimed to illuminate the factors influencing patients' decisions to embrace telemedicine. The challenge that both public and private health institutions face lies in justifying the substantial capital investment required for telemedicine infrastructure when patients' willingness to utilize such services remains uncertain. By clearly identifying these determinants, the study sought to contribute valuable insights for decision-makers. This knowledge can be pivotal in formulating effective strategies to attract patients to telemedicine services and enhance community health outcomes. Additionally, understanding patient preferences can assist in devising approaches to recoup the capital invested in telemedicine infrastructure.

Organization of the Research

The subsequent sections of this dissertation are organized as follows: Chapter II provides an in-depth literature review on telehealth and exploring the factors influencing and the impact of a patient's decision to utilize telemedicine. Chapter III presents the hypotheses, and Chapter IV details the methodology, offering insights into the obtained data results. Chapter V covers the discussion and potential policy implications, while Chapter VI serves as the conclusion of the dissertation.

CHAPTER II

LITERATURE REVIEW

Challenges and Opportunities of Telemedicine

In their (2013) analysis, Gilman and Stensland scrutinized the Medicare's 2009 telehealth claims to assess the expansion of different service offerings. Despite an escalation in the payment rate for telehealth services, the increase in Medicare telehealth claims was only 32%, from 26,000 to 38,000. The examination also identified instances of erroneous billing, resulting in financial consequences for both Medicare and medical practices, warranting further examination of tele-emergency services. A more recent study by Jørgensen et al. (2021) reflected on telemedicine use by exploring the efficacy of group telerehabilitation using the Otago exercises program (OEP) for patients aged 65 and older, following acute hospitalization, aiming to mitigate the loss of functional capacity. The study involved selected patients engaging in 30-minute OEP sessions three times a week for four weeks. However, the results were compromised after 31 out of the 33 eligible patients withdrew from rehabilitation (Jørgensen et al., 2021).

Identifying telehealth as a solution to consolidating provider networks mandated by insurers under the Affordable Care Act, Custer (2020) emphasized enhancing competition and reducing costs. While Custer delved into the expansion of telehealth treatment, the analysis fell short of investigating the broader implications of increased usage on the health system's capacity to consistently deliver quality outcomes to the patient population. An understanding of how telemedicine can bridge the gap in healthcare access [is needed] and limit the strain on resources, without compromising the care of patients with complex medical needs.

Finally, Park et al. (2021) assessed the expanded adoption and inclusion rates for telehealth benefits in the 2021 Medicare Advantage (MA) plan, revealing consistent coverage between 88.3% and 96.2%, with 94.1% of enrollees covered. Utilizing various data sources,

including “the 2020–2021 Q1 Plan Benefits Package files, the 2020 Landscape files, the 2020 M.A. Plan Directory file, and the 2020 M.A. enrollment data” (2021, p. 1), the authors explored the impact of the Centers for Medicare and Medicaid Service’s (CMS) expanded access to telehealth services. While coverage increased, further analysis is necessary to determine whether this expanded coverage has substantially increased telehealth usage among enrollees.

Social Determinants of Health

Social determinants of health (SDOH) encompass a range of social, racial, and environmental factors that significantly influence individuals’ access to healthcare, overall health status, and health outcomes. These determinants extend beyond healthcare facilities, shaping where people work, live, play, and go to school (Lebo et al., 2023). Housing and its availability are social factors intricately linked to income. Research indicates that children in economically disadvantaged neighborhoods experience poorer health and educational outcomes than their counterparts in more affluent communities (Romain et al., 2022). Furthermore, underfunding of social services is closely associated with insufficient investment in efficient infrastructure. This deficiency burdens community-based organizations and health insurers, compelling them to allocate more resources than necessary for SDOH service delivery (search, contracting, and outcome data management) (Butler & Nichols, 2022).

Culture comprises symbols, heroes, rituals, and ideals acquired from the environment. This cultural education begins before birth, shaping the personal beliefs of individuals belonging to the culture and influencing behavior. The extent to which an individual is oriented toward cultural aspects determines the magnitude of culture’s impact on them (Nwabueze et al., 2009). Numerous studies have shown that culture exerts a substantial contextual influence on the utilization of technology by individuals, organizations, and communities (e.g., Masimba et al.,

2019; Özbilen, 2017; Sunny et al., 2019). As such, one can postulate that culture plays a part in the adoption of telemedicine.

The lack of health insurance for approximately one in 10 Americans makes it extraordinarily difficult for these people to budget for prescription drugs, primary care visits, and preventative screenings. Access to essential healthcare services often diminishes upon job loss, due to the linkage of health insurance benefits to employment (Kollapally et al., 2022). Consequences of insurance coverage gaps include unmet medical or prescription drug needs, a lack of a regular source of care or physician, fewer well-child visits, and limited access to healthcare (Romain et al., 2022). Policymakers are increasingly directing attention to the impact of social and environmental factors on physical and mental health, along with the biological and psychological mechanisms that underlie these effects (Rotter et al., 2022).

Communities of color faced a higher likelihood of being categorized as essential workers during the COVID-19 pandemic, limiting their ability to avoid social contact by working from home (Romain et al., 2022). Additionally, a lack of sufficient insurance decreases the likelihood of seeking medical attention. These factors, coupled with a higher prevalence of comorbidities such as diabetes, hypertension, and obesity linked to SDOH, contributed to an increased risk of disease transmission in these communities (Romain et al., 2022).

As of 2022, poverty, which the government defines as having an annual income of less than $29,950 for a family of four (Shrider & Creamer, 2023), affected one in seven U.S. households. Even an income double the poverty limit would, in many locations, leave a family of four struggling to cover the costs of housing, transportation, food, utilities, and clothing (Kollapally et al., 2022). Despite notable recent improvements, access to care for Black and Hispanic children, particularly those from the most impoverished homes, remains lower than for

White children. These disparities encompass various socioeconomic factors such as jobs and education, necessities like food and shelter, violence and prejudice, and environmental factors such as pollution and community disorder (Rotter et al., 2022).

Many racial and ethnic minorities reside in underprivileged areas with inadequate schooling, and neighborhood segregation often precedes educational segregation. Individuals with low levels of education have reported higher levels of functional impairments and chronic illnesses (Kollapally et al., 2022). Inequities are exacerbated when privileged individuals more readily acquire technology and reap its benefits than those from underprivileged backgrounds. Lower-income communities, primarily consisting of African American and Latinx students, are less likely to participate in remote learning due to a lack of home internet connectivity. Recent data suggest that SDOH may have hindered telemedicine availability and, unfortunately, further exacerbated existing disparities in healthcare delivery during the epidemic (Romain et al., 2022).

Social Influence of Technology

Understanding the fine social structure of a population, as revealed by a social network, may help researchers comprehend why an individual may be more susceptible to infectious disease due to its specific network position and why the population as a whole may be vulnerable to the rapid transmission of disease (Krause et al., 2007). The early development of social network theory was shaped by three influential research traditions: the interpersonal relations tradition, which emphasizes the formation of cliques within groups; the sociometric analysis tradition, which applies mathematical graph theory techniques; and the anthropology tradition, which investigates community relations in less developed societies (Liu et al., 2017).

New connections may be possible thanks to technology, but there is not much evidence that digital connections affect them. Someone may perceive an online social network as a more current way to improve or change existing ties. The term *pre-existing relationship* most

accurately describes web-based communication used to establish or maintain relationships like friendship or interest groups, extended family links, or affiliations with a particular profession, political party, or religious organization (Merchant, 2012). Social networks can partially reflect the intricacy of social structures that other approaches lack. Social behaviors, including cooperative, antagonistic, predatory, competitive, and aggressive encounters, are represented through network relationships, to mention a few potential associations. One can also look into the strength, regularity, and directedness, that is, who started or supported an aggressive interaction of these interactions (Krause et al., 2007).

The flow of media messages and their effects on audiences are shaped by social networks, influencing the quality and quantity of relational ties, the structural positions of individual actors within a network, and various network properties, including density, centralization, and modularity. These consequences include shaping public opinion, marketing, the purposes and pleasures of media consumption, and changes in behavior brought on by prosocial initiatives (Liu et al., 2017). The network approach has a long and significant history in the social sciences and psychology, where it has been used to study human social organization. Its main strength is addressing population-level or cross-populational problems by constructing complex social structures from individual-level interactions. The network approach has its roots in mathematical graph theory (Krause et al., 2007).

The line separating the traits of more extensive online social networking and the more specialized realm of specific social networking sites is blurred. This separation is evident in web-based services that have helped communities of interest grow. Examples include the photo-sharing website Flickr, music-recommendation websites like Blip.fm, and other online venues that greatly benefit from having their own in-house communication tools (Merchant, 2012).

Biologists have posited that to better understand complex systems, it is necessary to study interactions among system components as part of a network of interactions rather than in isolation. The network approach is embraced in many domains, and such a strategy has contributed significantly to disciplines and levels of biological structure (Krause et al., 2007).

The presence of social assortative and individual variation holds significant implications for population-level contact patterns, such as the dissemination of information in animal populations, the spread of illnesses within and between populations, and the evolution of behavioral strategies (Krause et al., 2007). Network cohesiveness gauges how interconnected a collection of nodes are. This method has long proved effective at identifying subgroups or cliques that may exist within a broader social network. Network cohesiveness plays a critical structural role in mediating the impact of interpersonal networks in the context of media impacts research (Liu et al., 2017).

For the bulk of the 20th century, social networks in traditional societies were characterized by a predominance of face-to-face interactions concentrated in relatively restricted geographic areas (Merchant, 2012). People with high betweenness centrality serve as bridges in a network, connecting clusters that are not typically linked. Similar to gatekeepers, individuals with high betweenness centrality can hinder the spread of a concept, preventing it from reaching other parts of the network (Liu et al., 2017). In today's era of technologically mediated sociability, where social engagement is closely intertwined with enabling technology, the fusion of everyday human experience with mediated communication is noteworthy. While face-to-face communication seamlessly incorporates the latest celebrity tweets, text messages, and Facebook posts, it is essential to distinguish these two social networking concepts, particularly for

analytical purposes, acknowledging that in everyday life, they may blend similarly to the fortunes of *X-Factor* contestants (Merchant, 2012).

Hartono et al. (2021b) investigated the relationship between social influence or support and technology acceptance in Jakarta, Indonesia. The study's findings have broader implications as Industry 4.0 begins to shape the health sector, propelling the evolution of eHealth into what is now recognized as healthcare 4.0. The researchers described eHealth as encompassing various services, including web-based services, mHealth applications, including care provision, diagnoses, disease monitoring, self-management, and promotion of healthy lifestyle behaviors, online video services, and other technological solutions (Hartono et al., 2021a).

In 2017, the Google Play Store witnessed a remarkable increase of over 50% in mHealth apps, reaching 158,000—the highest growth rate for significant app sales that year, with around 325,000 mobile telemedicine applications registered in the same year (Hartono et al., 2021b). A key consideration for users is the compatibility of applications with their lifestyles and habits, which significantly influence continuous usage. Security is paramount for sustained usage; user trust in the application's safety correlates with increased usage. Moreover, users who feel comfortable with an app are more likely to recommend the technology to others (Hartono et al., 2021b).

Health Inequities or Disparities

The most frequent definitions of disparity in dictionaries are distinctions in age, position, circumstance, excellence, and dissimilitude (Carter-Pokras & Baquet, 2016). Health practitioners, program managers, policymakers, and researchers in the United States and other nations are now familiar with the terms *health disparities* and *health inequalities*, used interchangeably; although *health disparity* is the more commonly used term in the United States,

health inequity or *health inequality* is used elsewhere (Braveman, 2006). There has been debate about whether definitions of health disparities should include the idea of injustice or simply point out variations in health outcomes that might be relevant to any portion of the U.S. population. Different ethical, philosophical, legal, cultural, and technical views may produce differing definitions of health disparities or inequalities (Braveman et al., 2011).

Health disparities are critical benchmarks to gauge progress in achieving health equity. A direct correlation exists between health inequalities and the overarching goal of health equity. The term health equity encapsulates the concept of social justice in health, referring to an equal chance for individuals to attain good health, regardless of their socio-economic or socially marginalized background (Braveman, 2014). Equality in healthcare translates into equal access, utilization, and quality care for all, emphasizing fairness in meeting healthcare needs globally (Braveman, 2006).

Unsafe or risky living and working conditions exemplify avoidable underlying causes of inequality. Children who experience healthy development, particularly during their formative years, are more likely to excel in school, devise creative solutions to problems, forge meaningful relationships, and enjoy robust adult health (Carter-Pokras & Baquet, 2016). By contrast, individuals from deprived backgrounds may be vulnerable to financial toxicity, that is, the financial strain resulting from expensive medical bills due to inadequate health insurance (Gaffney et al., 2022).

Chronic obstructive pulmonary disease (COPD) is disproportionately more prevalent among rural Americans, with rural counties experiencing roughly twice the number of COPD cases compared to metropolitan areas. Despite the higher frequency of COPD in rural regions, individuals in these areas often exhibit more severe symptoms, including decreased lung function

and poorer disease management (Gaffney et al., 2022). Overcoming health challenges becomes particularly challenging for socially disadvantaged individuals, exacerbating health inequalities. Every person should be able to achieve their optimal health status without distinctions based on race or ethnic group; skin tone; religion; language; nationality; socioeconomic position; gender; sexuality; gender identity; age; physical, mental, or emotional disability or illness; geographical location; political or other affiliation; or other traits that are traditionally linked to unequal treatment or exclusion from social, economic, or political opportunities (Braveman et al., 2011).

A significant constraint in measuring disparities lies in the inability to definitively identify the specific determinants of health that contribute to a given inequality and accurately quantify the magnitude of these determinants (Carter-Pokras & Baquet, 2016). The resources required to be healthy include high-quality medical care, education, and physical and social environments conducive to health in places like homes, neighborhoods, and workplaces (Braveman, 2014). Healthy employees are more productive than those with poor health and incur lower annual medical costs. Additionally, more workers are available for the workforce in a population that is healthier. Likewise, political involvement is crucial for democracy and can be made more accessible with improved health. Governments must act in good faith by gradually reducing barriers to enjoying fundamental rights (Braveman et al., 2011).

The literature extensively examines the interpretation, definition, and operationalization of health disparities. Carter-Pokras and Baquet (2016) emphasized the importance of explicitly mentioning specific population segments in defining health disparities to inform policymakers and funding organizations. The ongoing debate about what is considered avoidable or unavoidable necessitates precision in defining goals; general remarks about reducing or eliminating inequality may lack specificity (Carter-Pokras & Baquet, 2016). It is crucial to

recognize that achieving health equity does not involve compromising the health of privileged groups but rather entails enhancing the health of socially disadvantaged individuals. Success in achieving health equity is measured by reducing health disparities and prioritizing improving health outcomes for the socially disadvantaged (Braveman et al., 2011). Telemedicine offers a way to address these issues.

Quality-Adjusted Life-Years (QALY)

A global focus has been placed on cost-effective healthcare interventions that could influence behavioral change patterns and support patients effectively and efficiently. As a result, there has been a drive toward using telemedicine models utilizing information technology. This is due to the high scope and frequency of cardiovascular disease and the associated financial burden (Farabi et al., 2020). A measure of subjective well-being is typically regressed on income, health status, and other socioeconomic variables for this technique. The trade-offs between income and health conditions are then calculated, allowing for an approximation of the income equivalency required for an individual to achieve well-being before health deterioration (Huang et al., 2018).

A more comprehensive cost-benefit analysis is required if the decision-maker is debating whether it is desirable to accomplish a particular goal or increase the budget. The cost-benefit analysis examines the best combination of healthcare initiatives to maximize a society's health by measuring all implications in terms of financial value (Bergmo, 2014). By considering factors like patient well-being and improved health outcomes, a cost-benefit analysis can provide a more holistic picture of the value of a particular healthcare initiative.

The term quality of life (QoL) relates to discussions in philosophy, medicine, and sociology about whether and how to assign value to various lives and health conditions. During the 1940s and 1950s, the clinical/medical community started focusing on QoL measures

(MacKillop & Sheard, 2018). Telemedicine is intended to improve quality of life by helping patients and physicians decrease needless hospital trips and tasks, enhance the standard of primary care services, continuously track the progression of diseases, create post-discharge illness management plans, and ultimately enhance clinical efficacy and clinical results (Farabi et al., 2020). Its effectiveness has been assessed in various ways, from the impact on processes to the results. The outcomes of most interest in economic assessments conducted in the United States have been diagnostic precision, avoidance of travel, and decreased hospitalization (Bergmo, 2014).

Many other nations use quality-adjusted life-years (QALYs) as a measurement tool to assess the cost-effectiveness of treatments. In the United Kingdom, this metric serves as the foundation for the work of the National Institute for Health and Care Excellence, and is at the center of healthcare decision-making (MacKillop & Sheard, 2018). Telemedicine improves QALYs, decreases the incidence rate, saves time, decreases outpatient visits, decreases hospital stays, and optimizes medical treatment services, all of which contribute to higher cost-effectiveness when compared to conventional methods of treatment (Farabi et al., 2020).

Many patients find monitoring such as tracking health conditions like cancer, diabetes, and other chronic diseases, burdensome because it requires frequent travel to consultations, which may affect their physical, emotional, social, and economic well-being. Bernard et al. (2022) looked specifically at the issue of monitoring rheumatoid arthritis (RA). Because patients in rural areas often lack easy access to rheumatologists and general practice care, there is a geographic discrepancy in the ability of the health system to meet the recommended guidelines for RA care (Bernard et al., 2022; Kessler et al., 2016).

Telemedicine may help RA patients manage their condition independently (Bernard et al., 2022). Using telemedicine for patients who are further away from service centers and providing services for extended periods helps increase the cost-effectiveness of this type of intervention (Farabi et al., 2020). For example, Buvik et al. (2019) assessed the cost-effectiveness of orthopedic telemedicine services in a town 148 kilometers from the University Hospital of North Norway. The value of the service equipment, unit expenses, travel expenditures, and salaries was evaluated using a trial-based economic evaluation study in 2017 and 2018. With a breakeven point of 151 patients per year and a healthcare cost perspective of 183 patients yearly, the remote tele-orthopedic service was less expensive than in-person care and achieves the same health outcomes (Buvik et al., 2019).

Telemedicine encourages patients to manage their disorders and raises the standard of at-home patient self-management (Jiang et al., 2020). A meta-study by Farabi et al. (2020) analyzed the financial effectiveness of telemedicine for patients with cardiovascular illness by evaluating 20 English- or Persian-language papers published between 2000 and 2008. While an accurate comparison analysis remains challenging due to the variability of the methods and technologies, most study findings generally pointed to telemedicine as a beneficial solution.

In-ambulance telemedicine, that is, collecting and transmitting relevant diagnostic data while the patient is en route to the hospital, facilitates clinical decision-making concerning the necessary protocols such as computed tomography scans and treatment initiation. This approach to telemedicine usage reduces delays in the stroke response process. Starting with a time gain of six minutes, in-ambulance telemedicine is a more cost-effective technique than routine stroke care alone. In-ambulance telemedicine overtakes conventional best medical practice after 12

minutes, resulting in 4.9 QALYs gained (0.005 QALY/patient) and a $4,040 reduction in long-term expenses (–$4/patient) (Espinoza et al., 2017).

Bernard et al. (2022) estimated that worldwide, RA patients incurred yearly direct expenses ranging from $401 to $67,306 and indirect costs ranging from $595 to $22,444, with the introduction of biotherapy in France leading to an annual RA cost between €5.7 and €7.1 billion, which is steadily increasing. A two-arm, open-label clinical trial conducted at Montpellier University Hospital, France's rheumatology division, examined telemedicine's advantages in treating RA patients. Forty-four individuals were seen during routine office visits, while 45 patients participated in the trial's telemedicine program. On average, telemedicine patients spent significantly less on hospital visits (€69.4 vs. €99.7, $P < 0.01$) and less on transportation (€336.5 vs. €435.5) and inpatient admissions (€1,606.8 vs. €2,464.6) (Bernard et al., 2022). As such, the benefits of using telemedicine in such situations are quite apparent.

Chronic heart failure (CHF) is a condition imposing a substantial burden on social institutions and healthcare infrastructure, with estimates indicating that 37.3 million people worldwide are affected by CHF, and its prevalence is on the rise (Jiang et al., 2020). For patients with cardiovascular disorders, telemedicine can help with various care services, such as early prevention, acute treatment, rehabilitation, chronic disease management, and palliative care (Farabi et al., 2020). Chronic disease-related medical expenses are rising quickly, and the explosive cost needs to be tackled soon. Telemedicine services are suggested as a promising remedy for this issue, potentially enhancing patient care, particularly for people with chronic medical conditions, including diabetes, hypertension, and even cancer (Rho et al., 2014).

Rural patients with mental health issues typically have fewer visits, enter care later in the disease development, present with more severe symptoms, receive lower-quality care, and

require more expensive therapy than their urban counterparts (Pyne et al., 2010). Lack of collocated mental health professionals in primary care settings, minimal connections to off-site mental health specialists, restricted mental health insurance coverage, and cultural difficulties are potential causes for this urban/rural difference. Patients are now expected to take charge of their healthcare and follow prescribed procedures to maintain health and reduce difficulties. Patients with chronic conditions can experience better outcomes and quality of life by fostering self-efficacy (Farley, 2020). Although there are countless healthcare apps available online that aim to advance the current status of healthcare, the acceptance of telemedicine remains a problem (Balapour et al., 2019).

Existing Telemedicine Research

Although the existing research on telemedicine is limited, the literature does provide a fundamental understanding of the subject. Gamble et al. (2004) studied the cost-effectiveness of telemedicine capital expenditures for transitioning the medical profession and evaluated the conditions in which telemedicine is a resilient business model. The authors conducted a qualitative value chain analysis of tele-radiography for a trauma center and telerehabilitation for wound care to evaluate a model for assessing the financial sustainability of a telehealth program. Further study is needed, however, particularly investigations of telehealth programs that fail the value chain analysis, to identify the factors that cause a service to be unprofitable.

Brown (2008) investigated the Michigan Stroke Network's support for rural stroke patients through telehealth robotic assistance, and found it improved patient outcomes through prompt intervention, which is critical to improving recovery and reducing the cost of patient. A qualitative review of St. Joseph's Mercy Oakland hospital's (SJMO) decision-making process provided valuable insight into issues-based solutions. Following up with SJMO's experience and patient results provide an important perspective on lives saved and patient costs.

Gaudette et al. (2015) explored the effects of the Medicare demographic shift, and the resulting financial impacts incurred by CMS system, using the USC Leonard D. Schaeffer Center for Health Policy and Economics as a test case. They used "the Future Elderly Model (FEM)—a microsimulation model of health and economic outcomes for older Americans—to generate a snapshot of changing Medicare demographics and spending between 2010 and 2030" under current Medicare program rules (Gaudette et al., 2015, p. 75). FEM identified chronic disease categories, but the authors did not clarify whether chronic diseases were the most likely medical issues serviced or the largest area of expenditure by Medicare. They determined further analysis was needed to explore the costliest ailments treated by Medicare and the value of preventative healthcare investments in reducing the lifelong cost for the additional 27.2 million Medicare beneficiaries.

Using the queueing theory, Zhong et al. (2018) explored e-visits with a focus on their effect on primary care physicians' capacity to deliver care and improve patient access. They found that primary care physicians should view e-visits as the preferred medical services access point for all patients with chronic or acute nonurgent care needs. Studying the financial benefits could offer a visionary perspective for the future by identifying the research limits, which involve commenting on the unsettled nature of current reimbursement and insurance policies for physicians and patients.

From January 2000 to October 2020, Nguyen et al. (2021) evaluated peer-reviewed studies that examined e-visits for clinical outcomes, quality of care, access to care, utilization, and costs. After evaluating 1,859 studies using the Risk of Bias Assessment Tool for Nonrandomized Studies, the authors included 19 studies in their analysis. The study confirmed

that e-visits were sufficient for chronic disease management, but further examination of e-visit implementation conditions was necessary.

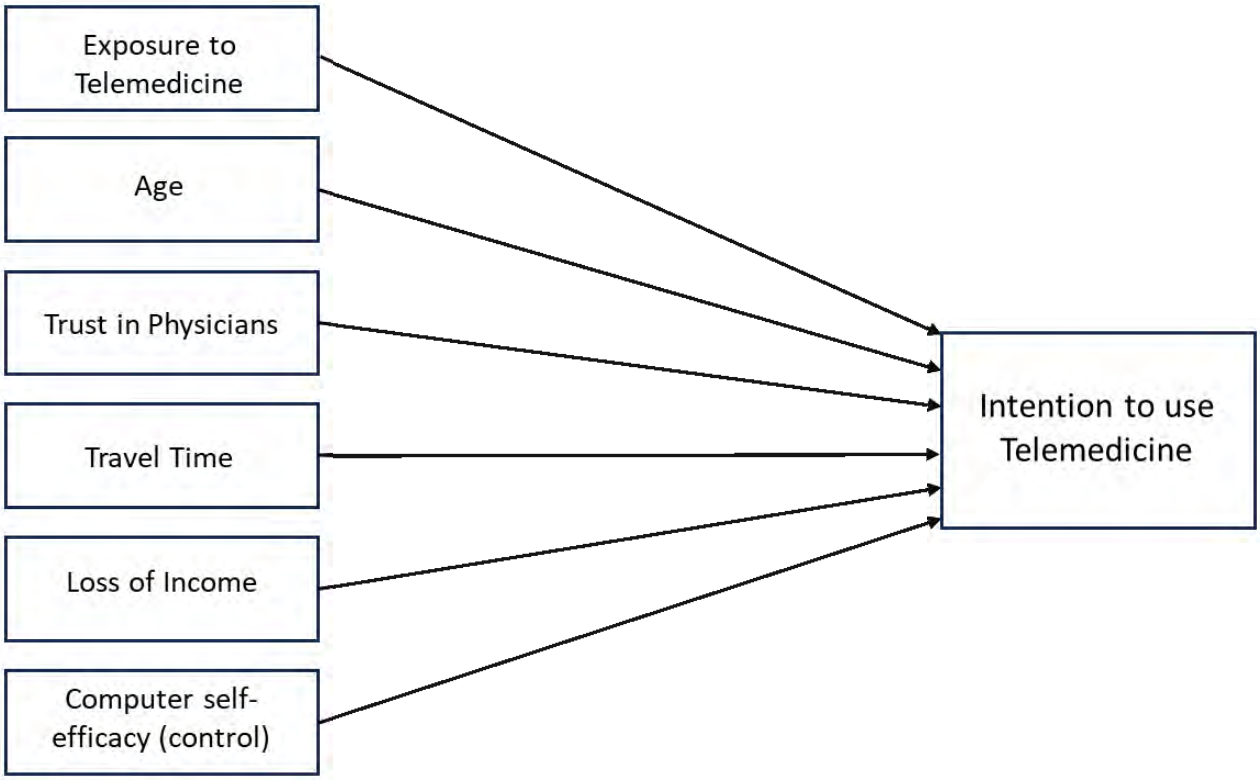
As one can see, there exists a developing body of literature that examined how medical providers were influenced to use telemedicine and the value proposition it presented for their efficiency and patient healthcare improvement. Though many medical providers understand the value proposition, they are unable to entice patients to use the technology due to a lack of understanding of patient desire to use telemedicine. This study addressed this issue.

Model Development

Figure 1 shows the model that was tested. In this study, the six independent variables, one of which was a control variable, were shown to affect the outcome of intention to use telemedicine.

Figure 1

Research Model



Patient Intention to Use Telemedicine

There exists a well-established body of literature regarding the population's general acceptance and usage of technology. As companies integrated technology into the workplace, researchers robustly examined employee acceptance and willingness to use the integrated technology (Godoe & Johansen, 2012; Sagnier et al., 2020; Srite & Karahanna, 2006; Teo, 2011; Venkatesh & Bala, 2008; Venkatesh & Davis, 2000). Although telemedicine integrates many communication capabilities, such personalized use of these technologies for medical treatment is limited. The application of existing schema of technology acceptance were applied to the current topic.

End User Acceptance

Telehealth success is predicated on end-user acceptance. This literature review assessed the impact of end-user acceptance on telemedicine, focusing specifically on technology acceptance model (TAM) and mobile application rating scale (MARS). The MARS questionnaire is the most frequently used for assessing mobile health (mHealth) services (Hajesmaeel-Gohari et al., 2022).

A relatively practical approach for discovering factors influencing user adoption of computer technology is the TAM, which includes a set of two variables, perceived ease of use and perceived utility, frequently utilized in numerous contexts. The TAM was effective at predicting physicians' willingness to use telemedicine (Rho et al., 2014). Existing academic and professional literature proposed three models of technology acceptance and use, the TAM, the theory of reasoned action (TRA), and the theory of planned behavior (TPB), in recognition of the significance of this issue. These models draw on theories from various research streams, including social psychology, cognitive psychology, and the diffusion of innovations. Although the specific linkages incorporated in these models vary, there are significant commonalities

between their fundamental concepts. In particular, these theories assert that individual attitudes and beliefs regarding new IT play a significant role in establishing usage patterns (Agarwal et al., 2000). Researchers urge others to investigate whether the TAM's belief factors mediate the effect of other variables and, if so, which external variables are crucial despite the TAM receiving much support (Porter & Donthu, 2006).

Telemedicine was previously studied from an end-user perspective, but an important question is: What causes a physician to use telemedicine? Are clinical practice expectations, personal reasons, or other determinants driving a physician to use telemedicine? The TAM and the TRA are applied to explain the use of telemedicine in clinical practice. Physicians in three countries were surveyed to examine the determinants of telemedicine usage. A modified TAM was used to assess physicians' use of information and communication technology (ICT). All three groups showed a higher likelihood of telemedicine use if they used technology in their personal lives. Additionally, the more ICT used in hospitals, the higher the probability that physicians will use telemedicine. Exposure to technology increases the telemedicine use rate among physicians.

The limited understanding of user requirements is a significant barrier to developing and implementing health information technology (IT) systems. Kayser et al. (2015) presented a multidisciplinary framework for modeling user needs and requirements with a user-context-task matrix for eHealth literacy and safe systems design. User involvement in IT system development and design has proven valuable for acceptance. An increase in the use of network IT to share health information requires consumers to be eHealth literate. End-user needs must be incorporated into Health IT design to increase usability.

Kayser et al. (2015) created a five-step framework to understand user needs. The framework highlighted a generic approach to requirements-gathering helpful for designers to understand end-user needs:

1. Assembly of a brainstorming group
2. Initial list of user characteristics and tasks
3. User-task-context matrix
4. Review of step 3 characteristics
5. Refinement of needs

Three major drivers were identified for end user adoption of technology: capabilities, access to technology, and experience using technology. The framework was designed to provide user-friendly health systems. Safe and implementable IT systems and policy development increase the probability of favorable health outcomes when user requirements are considered. Empowering consumers and expanding eHealth literacy is the goal of the expanded framework; innovative design should increase the use of health information systems.

Technology Acceptance Model

Information system researchers looked to social psychology as the theoretical foundation to establish the first end-user acceptance theory models. The TAM predicts technology acceptance by the end user (Zanaboni & Wootton, 2012). Designers and practitioners must remain hyper-focused on end-user needs when designing a telemedicine tool. Assigning end users a secondary or passive role harms the tool's success (Vega-Barbas et al., 2014). The TRA theory was later adapted into the TAM (Davis, 1986). The TAM focused TRA on the end user's belief of the technology's perceived usefulness (PU)—that is, "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989,

p. 320), and perceived ease of use (PEU), “the degree to which a person believes that using a particular system would be free of effort” (Davis, 1989, p. 320). According to Godoe and Johansen (2012), the TAM explained system usage 30–40% of the time, with PU as the most vital determinant.

TAM has been continuously refined by incorporating additional user characteristics. These expanded versions are known as TAM2 and TAM3. A (2000) collaborative study by Venkatesh and Davis sought to expand TAM’s PU construct research and understand whether increased familiarity with a system changes use-intentions. TAM2 adds social influence and cognitive instrumental processes to the TAM construct. In the context of computer usage, TAM2 theorizes that “the direct compliance-based effect of subjective norm on intention over and above perceived usefulness and perceived ease of use will occur in mandatory, but not voluntary, system usage settings” (Venkatesh & Davis, 2000, p. 188).

Venkatesh and Bala (2008) further extended TAM2 to create TAM3. Combining TAM2 and the Venkatesh and Davis (2000) study on PEU determinants created an integrated approach. Plotting a relationship pattern of determinants created a nomological network of users and adoption by end users. There are three TAM3 relationships: “(i) PEU and PU; (ii) computer anxiety and PEU; and (iii) PEU and behavioral intention” (Venkatesh & Bala, 2008, p. 281).

Godoe and Johansen (2012) sought to understand the adoption of innovative technologies by end users. A questionnaire was distributed to 186 employees of government and private Norwegian organizations. Sixty-three respondents were instant message users, and 123 used electronic health records for Central Norway Regional Health Authority. The questionnaire included a technology readiness index (TRI), derived from 36 belief statements related to the technology readiness dimension, and 12 TAM items to rate PEU and PU. TRI was measured on a

5-point Likert scale, while TAM was assessed on a 7-point Likert scale. PU directly affected actual use while PEU did not, supporting the expectation set by prior studies. For TRI, optimism and innovativeness positively affected TAM. Structural equation modeling in Amos 6.0 examined the degree of latent dimensions. The main takeaway was that considerable emphasis on end users' attitudes toward technology was essential when implementing a new system.

Understanding the consequences of clinical work systems on clinicians' decisions to reject or accept improves implementation success. Holden and Karsh (2010), for example, applied TAM to explain and predict reactions by end users to Health IT. Research should include a review of already implemented Health IT and reactions of clinician end users. Understanding how and why a system is used is as important as whether the system was purchased and installed. TAM research accounts for 10% of information systems publications and 30–40 % of all IT acceptance studies.

The complexity surrounding the acceptance of technology is evident; therefore, I propose the following variables influence the acceptance of telemedicine.

Hypotheses

Patient Exposure to Telemedicine

Understanding potential users' attitudes and the variables that affect their decisions to use the technology is crucial to the effective deployment of telemedicine. It has been determined that patients are somewhat willing to use telemedicine in various contexts, including psychiatry and dermatology (Eikelboom & Atlas, 2005). Patient attitude toward telemedicine, satisfaction with existing treatment, and rapport with their doctor all influence patient willingness (Eikelboom & Atlas, 2005). Patients' preferences for getting their medical treatment locally are well-established. For instance, older patients, who are often overrepresented in numerous rural areas in the United States, tend to prefer face-to-face medical care, as it allows for greater family

involvement, a factor potentially associated with improved treatment outcomes (Potter et al., 2016).

It has been suggested that merely being exposed to something fosters a sense of familiarity that makes a stimulus seem less dangerous and prompts approach behavior (Grimes & Kitchen, 2007). In that vein, Todaro et al. (2023) discussed how an anthropologist and a nurse with specialized training performed awareness campaigns in rural areas of Bolivia, targeting representative locals. Educational and awareness initiatives were conducted using the same research designs as those carried out previously by organizations in other comparable locations of the Bolivian Gran Chaco. Increased emotions may naturally surface with repeated exposure to a stimulus; that is, positive affection is more likely to be elicited by stimuli that are regular and easy to perceive (Chen et al., 2016).

Furthermore, the mere exposure effect, a concept popularized by Zajonc (1968), is a well-known phenomenon whereby repeated prior exposure to a stimulus increases the likelihood that said stimulus is evaluated positively (Nanay, 2017). People's social and cultural cognition regarding a stimulus category is influenced by how frequently they are unintentionally exposed. Even exposure to a stimulus category can subconsciously change one's preferences. It is hypothesized that merely being exposed might have unintentional consequences on people's views of how well-known a particular category is in their community (Kwan et al., 2015).

People favor stimuli they have already experienced over stimuli they have never encountered. In general, people enjoy stimuli the more they are exposed to them. The simple exposure effect describes a general propensity to prefer familiar stimuli over unfamiliar stimuli (Abakoumkin, 2018). It has been suggested in the literature on marketing communications that

the familiarity impact of exposure alone may reduce the perceived risk associated with a brand, resulting in preference development and brand choice (Grimes & Kitchen, 2007).

The subject of patient exposure to telemedicine has not received much research. Limitations on access to medical treatments due to distance or timing are significant factors; travel, time, and cost reductions have been demonstrated, but the impact on patient exposure has not been proven. Telemedicine may change the hospital's and the community's relationship by enabling rural residents to receive more of their treatment locally and improving locals' perceptions of the hospital (Potter et al., 2016). People may assume that something is well-known in their community if they are exposed to it frequently, even if they have no prior knowledge of it, are exposed to it incidentally, and do not consciously process information about it. This idea is based on research on the psychological effects of mere exposure (Kwan et al., 2015). As such, the following was proposed:

H1: *There is a positive relationship between exposure to telemedicine and the intent to use telemedicine.*

Patient Age

Skerrett et al. (2021) found that adults entering emerging elderhood (EE), age 55–75, experience a difficult transition period. The clinicians used stories from clients to understand the complexities of aging and the impacts on individual well-being. Older adults face complex care needs that the current healthcare system is unprepared to meet (Bragg & Hansen, 2015). Further exploration of EE health and the cost of healthcare is warranted. Although medical morbidity may contribute to this explanation, existing evidence indicates that age positively correlates with medical usage (Fergus et al., 2017).

Age influences patients' healthcare experience and their views on communication in medical contexts (DeVoe et al., 2009). Hippocrates established the tone for this discussion by claiming that doctors have the duty to determinine how much knowledge is in the best interests of their patients. Most medical textbooks support this point of view and state that while determining how much information should be provided to patients, clinicians should consider their age, educational background, prognosis, and other criteria (Waitzkin, 1985). Patient age is also inversely correlated with the capacity to integrate information for precise decision-making. In contrast, age was positively correlated with the desire to seek more information, taking longer to make a decision, and placing higher value on diagnosis information (Taylor, 1975).

Older patients require a different approach from physicians due to age-related attitudes, reduced time spent, and the importance of supportive interactions and effective communication (DeVoe et al., 2009). In general, age has a more significant impact on decision-making performance than does decision-making experience (Taylor, 1975). Older patients tend to receive more physician explanations, multilayered explanations, and non-discrepant replies, albeit only the first of these patterns approached statistical significance. The time doctors spent educating patients, which was longer for middle-aged patients than younger, was not strongly correlated with age (Waitzkin, 1985).

As such, age is expected to have an inverse relationship with awareness of telemedicine and usage of medical services. Age typically influences the usage of medical care (Fergus et al., 2017). Younger, healthier people are less likely to use medical services, are more technologically inclined, and more likely to use telemedicine. Younger patients appreciate having control over their healthcare, putting a greater focus on the speed and aggressiveness of their treatment.

Older patients, by contrast, value continuity of treatment with the primary care physician who made the majority of their medical choices. They place more significance on anticipatory treatment and care for the entire person than they did for each sickness or symptom (DeVoe et al., 2009). With increased visits for numerous age-related ailments, older patients build a rapport with their physician, are more likely to prefer face-to-face interactions with their doctor, and are less likely to be aware of telemedicine. Therefore, the following was proposed:

H2: *There is an inverse relationship between age and the use of telemedicine.*

Patient Loss of Income

Telemedicine may not only decrease and stabilize the cost of healthcare, but also reduce the financial burden of family caregivers. AARP estimated that 44 million Americans provided care and support to someone dealing with limitations in their physical, emotional, or cognitive functioning. The value of this labor, most of which is unpaid, amounts to a value of $470 billion nationwide (Kriss, 2018). Travel time to and from medical appointments accounts for a portion of this value. If telemedicine usage were to remain at a consistent level of 10% of all visits, numerous health systems would experience a significant increase of at least 1,000% over that period (Mehlman & Tamburri, 2020).

Telemedicine minimizes time requirements, which reduces income loss from attending in-person doctor visits. This income loss affects patients and can potentially harm the financial status of any designated caregivers. Trends indicate that the caregiver-to-care-receiver ratio will decrease from 4.1 to 2.9 as the number of older adults requiring care increases through 2050 (Bragg & Hansen, 2015). Among other things, the rising number of doctors who specialize has been blamed for the high expense of medical treatment, with patients forced to visit costly experts for general care (Allard, 1993).

The increased cost of care, and the work time lost in obtaining it, further impacts family members who have taken responsibility for aging parents. Demand becomes comparatively more sensitive to changes in the opportunity cost of time when the out-of-pocket cost per unit of medical services decreases, either due to improved insurance coverage or the availability of subsidized treatment (Acton, 1975). While the sick and aged frequently depend on professional care, they also receive informal care from family members, including children. The demographic trend of a growing older population and rising life expectancy may significantly affect the younger generation's labor market participation because adult children frequently take on care obligations (Léger, 2000).

Earned and unearned income can affect healthcare demand differently. Through a positive income impact, a rise in unearned income enhances the demand for healthcare. Through the same mechanism, a rise in earned income also tends to enhance consumption. However, it also raises the opportunity cost-of-time because the individual must choose between earning money and going to the doctor. Time spent unwell also has a higher opportunity cost, (Allard, 1993). Those who take on primary care duties report significant decreases in working hours, involvement, and income (Léger, 2000).

Bragg and Hansen (2015) found that older adults face complex care needs that the current healthcare system is unprepared to meet. Family caregivers cannot afford to miss work to meet aging family members' needs, and lost wages and retirement contributions have lasting future implications for their own financial security. Earlier research indicated a conflict between caregiving and working hours, though it did not consider the potential influence of the parental living situation on the child's labor supply (Léger, 2000). The growing population of older adults necessitates attention to societal needs (Bragg & Hansen, 2015). The marginal cost of healthcare

and time affects the population (Allard, 1993). The income effect that results from a rise in hourly wages spurs an increase in demand. Additionally, it increases the opportunity cost-of-time, which lowers the demand for activities that require much time (Acton, 1975).

Diverse parental living arrangements may influence diverse behaviors in adult children. Therefore, parental sickness's overall impact on adult children's labor supply may not appear to be significant. Children may need to provide unofficial care for parents who live independently or share a home with a relative (Léger, 2000). Earned and unearned income directly affect the use of medical services. Both changes in hourly pay and unearned income might result in exogenous changes in income. In general, the two impacts are not equivalent. The same presumptions that allow money to act as a price also allow for an increase in unearned income to increase demand for medical care (Acton, 1975).

Intuitively, a decrease in wages would have a more pronounced impact on the price sensitivity of telemedicine care demand while significantly affecting the income-driven demand for in-person healthcare services (Acton, 1975). People use more healthcare if their unearned income increases. In contrast, it can be argued that a decrease in income has the opposite effect on their ability to pay their bills (Allard, 1993), affecting the likelihood of attending medical appointments. As such, the following was proposed:

H3: *There is a positive relationship between loss of income and the use of telemedicine.*

Patient Trust in Doctors

Trust is pivotal in shaping interpersonal connections across all spheres of human relationships. Within the doctor-patient relationship trust assumes the form of a pact, wherein the patient firmly believes that the doctor acts with their best interest in mind (Gopichandran & Chetlapalli, 2013). Interpersonal trust is frequently viewed as a learned personality attribute

established through time and negotiation between individuals. It is simpler for the trustor to rely on the trustee and even predict their future behavior when the two parties have formed a working relationship (Katz, 2021).

Trust in the healthcare system and physicians is an essential and recognized cornerstone of delivering optimal healthcare and achieving favorable health outcomes. It represents an optimistic acceptance of one's inherent vulnerability and a steadfast belief that physicians or healthcare institutions/systems diligently safeguard one's interests. The former represents interpersonal trust, and the latter represents impersonal, institutional trust. This trust forms the bedrock for cultivating meaningful and effective healthcare interactions, facilitating desirable health outcomes (Nikodem et al., 2022). The relationship between patients' trust in a physician and their trust in the physician's institution is strongly correlated; yet the interrelationship of the two remains unclear (Rolfe et al., 2014).

Physician trust encompasses the patient's optimistic acceptance of their vulnerable state, driven by the belief that the physician genuinely has their best interests in mind. The inherent vulnerability of patients is a crucial component of trust, as, without it, the need for trust in the physician would diminish. The greater vulnerability a patient experiences, the higher the likelihood they trust their physician (Ivy, 2018). A qualitative study conducted on physicians indicated that the presence of a personal physician who possessed knowledge of the patient's background, social context, and family dynamics would substantially enhance comfort levels and foster trust in healthcare (Gopichandran & Chetlapalli, 2013).

Trust in doctors refers to individuals' confidence in healthcare institutions and the medical profession as well as their willingness to rely on and engage with them. It is nurtured through positive encounters and personal experiences, grounded in one's faith in the organization

or institution (Katz, 2021). Those who believe that the healthcare system, safeguards their interests, which is reflective of trust in their doctor, are more likely to use telemedicine. Therefore, patients' intent to use telemedicine increases as trust in doctors increases. With that in mind, the following was proposed:

H4: *There is a positive relationship between trust in doctors and the use of telemedicine.*

Patient Travel Time

Telemedicine offers the ability to address the challenges posed by geographical distance and time constraints, thereby enhancing accessibility for families and improving their access to healthcare services (Kessler et al., 2016). The escalating opportunity cost-of-time and longer waiting times for receiving care have been long-standing critical factors (e.g., Acton, 1976). Emerging research indicates that older patients, Black people, and those from lower income brackets face disproportionate challenges accessing regionalized care or traveling to high-volume centers for surgical care (Ramirez et al., 2019). Telemedicine has emerged as a convenient alternative to in-person visits, eliminating the need for patients to travel to meet with specialists. Notably, telemedicine has been shown to yield comparable patient outcomes and equal or higher levels of patient satisfaction when compared to traditional face-to-face appointments. Telemedicine is a viable and advantageous option for healthcare delivery (Dullet et al., 2017).

The primary obstacles were the unavailability of local healthcare providers or transportation concerns (Kessler et al., 2016). Families who had face-to-face appointments spent an average of seven hours away from work. In contrast, families who had appointments via videoconference spent an average of four hours away from work (Smith et al., 2003). The demand for medical services is likely to exhibit greater sensitivity to variations in travel time compared to waiting time. Travel often entails financial costs contingent on distance or duration,

with distant facilities typically requiring higher, yet unobserved, financial expenditures (Acton, 1976). For patients who received treatment in specialist hospitals, there was an inverse relationship with distance, indicating a protective effect where longer distances were associated with better outcomes (Obrochta et al., 2022).

Telemedicine offers an effective solution to alleviate the financial burden faced by families who must travel long distances to receive healthcare services (Kessler et al., 2016). When the out-of-pocket payment for a unit of medical services decreases due to factors such as expanded insurance coverage or subsidized care, the demand for these services becomes relatively more responsive to changes in time prices. The demand for free medical services is expected to be more sensitive to price variations over time than the demand for paid services. This sensitivity occurs because time represents a more significant proportion of the total price for free providers than paid providers (Acton, 1976).

Patients were categorized into two groups based on travel time: local, defined as a travel time of less than two hours, and regional, defined as a travel time equal to or greater than two hours. The Lancet Global Surgery Commission initially suggested a threshold of two hours for adequate access to surgical care, which has since been endorsed by the World Health Organization as a guideline for determining the maximum acceptable travel time to access healthcare services (Dotse-Gborgbortsi et al., 2023).

Smith et al. (2003) found that the median time spent traveling for videoconferences was 30 minutes, with an interquartile range (IQR) of 20 to 60 minutes. The median travel time for face-to-face appointments was 80 minutes, with an IQR of 50 to 153 minutes. Families who attended videoconferences spent half as long waiting for their appointments, with a median of 10 minutes, compared to families in the outpatient department, with a median waiting time of 20

minutes. Travel times tend to be longer for public transportation than for private vehicles. However, evidence suggests that treatment facilities are often located closer to neighborhoods where access to a private vehicle is limited, thus potentially favoring those with lower household access to private vehicles (Obrochta et al., 2022).

Individuals who assign a lower value to their time are more likely to capitalize on opportunities to reduce out-of-pocket expenses compared to those with a higher time value. This is because their time is relatively less costly, enabling them to benefit from reduced financial burdens. Consequently, individuals with lower time valuation are more inclined to capitalize on reduced expenses (Acton, 1976).

It is anticipated that a change in demand, leading to increased access to medical services, such as prolonged waiting or additional travel due to referrals, prompt a corresponding supply response. This response exacerbates the relative advantage for individuals with lower time valuation, as their time costs are comparatively lower. However, it should be noted that the overall demand may be reduced due to the increase in time prices resulting from the supply response (Acton, 1976). There is often confusion between the value and cost-of-time concepts. It is important to note that a low opportunity cost does not necessarily imply a low value of time. It is crucial to distinguish between the value, which represents the net benefit derived from the time spent in an activity, and the opportunity cost, which refers to the net benefit of the time spent in the next best alternative activity (Shaw, 1992).

Acton's (1976) model anticipated that the elasticity of demand for medical services in relation to time prices would surpass the elasticity in response to monetary prices when out-of-pocket costs decrease. The variations in time prices have a more pronounced impact on the demand for free medical services compared to the demand for services that require payment.

Cost-effectiveness and cost-utility provide direct assessments of opportunity cost. The analysis involves evaluating the costs and outcomes of different healthcare interventions or programs to determine their relative value and efficiency. Researchers can quantify the opportunity cost of selecting one intervention over another by conducting a comparative cost-benefit analysis for each alternative intervention.

Cost-effectiveness assesses the costs and health outcomes in monetary terms, while cost-utility studies incorporate the concept of QALYs to measure the overall health-related quality of life associated with different interventions. These studies allow decision-makers to make informed choices by considering the opportunity cost of investing resources in specific healthcare interventions and identifying the interventions that offer the most value for the resources invested (Palmer & Raftery, 1999). By improving accessibility, telemedicine provides patients with a more convenient and efficient alternative, allowing them to minimize travel-related burdens and associated expenses while accessing necessary medical care (Dullet et al., 2017).

H5: *There is a positive relationship between travel time and the use of telemedicine.*

Controls

Patient Computer Self-Efficacy

Computer self-efficacy (CSE) was included as a control because demonstrating self-efficacy using digital systems can predict whether or not those technologies are used effectively (Ulfert-Blank & Schmidt, 2022). Although similar, skills and competence beliefs should be distinguished because they affect motivation, performance, and learning. Computer knowledge and current computing experience measure how much one has learned and developed via one's use of computers in the past and present.

A person's self-perception of their level of familiarity with computers in various application fields is their level of computer expertise. The frequency with which computers are used for various tasks and purposes is the current computing experience (He & Freeman, 2010). Although some researchers have found no conclusive evidence that using a computer affects older individuals' well-being, others have found that older adults who use computers and the internet can experience various health benefits. For instance, using webcams or email to communicate with doctors during consultations could replace face-to-face encounters altogether (Laganà et al., 2011).

Digital systems allow people to accomplish increasingly sophisticated jobs or engage with highly individualized systems, even though specific action stages, such as sorting information, are eliminated. People must be more technologically savvy and adaptive to fulfill expectations and take advantage of new opportunities (Ulfert-Blank & Schmidt, 2022). The idea of the digital gap is constantly changing to reflect the wide range of consequences linked to technological exclusion (Ball et al., 2020). General CSE shapes attitudes and decisions regarding IT usage by influencing important beliefs like perceived ease of use, and is recognized in the social cognitive theory as a critical factor regulating one's computer behaviors (He & Freeman, 2010).

According to self-efficacy theory, social networks are important sources of social support, which is critical to raising one's level of self-efficacy (Young et al., 2022). CSE, often explained as an individual's assessment of their computer-using skills, is a specific application of the broad construct of self-efficacy, a foundational idea of social cognition theory created in the study of learning and human behavior (He & Freeman, 2010). The distinction between general computer and task-specific self-efficacy is apparent when reviewing the conceptual and

empirical work on self-efficacy. Task-specific computer self-efficacy is the perception of one's capacity to perform computer-related activities in general computing. In contrast, general CSE is defined as an individual's efficacy evaluation across different computer application domains (Agarwal et al., 2000).

A healthy self-concept takes into account CSE, competence, and assurance when using a computer. Enhancing CSE is likely to contribute to older adults feeling more positive about themselves, potentially leading to improvements in their psychological health (Laganà et al., 2011). Embedding in networks with like-minded individuals is one approach to gaining support. This behavior is associated with increased self-efficacy in activities supported by the group and increased openness to discussing touchy subjects, like HIV prevention, with peers (Young et al., 2022). Increasing social support through socialization via email, instant messaging, chat rooms, and other virtual social networks could enhance older individuals' mental health (Laganà et al., 2011).

Men and women use different socially created cognitive structures to encode and process information, influencing and directing perceptions. As a result, people frequently make biased choices in their perceptions and behavior, with gender schemas viewed as a normative framework that influences unintentional or internalized behavior compatible with the schema (He & Freeman, 2010). Many academics contend that people of all ages develop attitudes through experience and that views can change by gaining more experience in a particular field. Evidence suggests a link between CSE and personal perceptions about IT, particularly with perceived usability and expected results (Laganà et al., 2011).

Self-efficacy beliefs are formed through four main informational channels: active mastery experiences that act as indicators of capability; vicarious experiences that change efficacy beliefs

through the transmission of competencies and comparisons with others' accomplishments; verbal persuasion and related forms of social influence, which lead one to believe that one possesses specific capabilities; and physiological and emotional states, which people use to gauge their competence (Agarwal et al., 2000). An individual's response to technology is greatly influenced by gender (He & Freeman, 2010). For older people, hands-on instruction in computer technology seems to be the most beneficial. Researchers have found that as students become skilled in computer technology, the challenges they first face learning to use computers are sometimes readily disregarded, transforming the use of technology later in life into a rewarding experience (Laganà et al., 2011).

The diffusion of innovations theory emphasizes the links between individual assessments of an innovation's characteristics and its propensity for adoption. The relevant characteristics are relative advantage, compatibility, and complexity. The social network approach asserts that relationships significantly impact people's attitudes, beliefs, and behaviors more than their unique traits (Young et al., 2022). The digital divide examines how a lack of digital access impacts different ICT skills and uses. Another way to think about the digital divide is as a collection of *access gaps* with different dimensions. The first dimension, a material access gap, is a lack of access to the equipment and infrastructure required for digital inclusion (Ball et al., 2020).

The conditions in which people are born, live, play, learn, worship, work, and age are SDOH. They impact one's health in the long run and contribute to various health disparities (Young et al., 2022). Because these factors are frequently linked to demographic-based disparities in internet use, researchers also looked into how age, education, income, and race connect to perceptions about the internet (Porter & Donthu, 2006). Access to health services,

poverty, and education level are the only social variables identified as upstream obstacles to healthcare (Young et al., 2022).

It is crucial to acknowledge that the TAM and CSE represent distinct approaches in evaluating technology use. The TAM gauges whether an end user believes the technology is user-friendly and valuable to them. By contrast, CSE assesses a person's effective use of technology, measuring the patient's confidence in utilizing technology for a telemedicine appointment. The assessment was conducted online via Amazon Mechanical Turk (MTurk) (see below), potentially increasing the likelihood that survey participants have a high CSE and are confident in their ability to use technology effectively. As such, CSE was controlled in this study.

CHAPTER III

METHODOLOGY

The research methodology utilized in this study involved a quantitative survey to investigate the patient population's intention to adopt telemedicine and evaluate the impact of variables on this intention. Patient self- and clinical-care can be improved with the adoption of telemedicine. Survey research analyzes a population sample to produce a quantitative or numerical description of trends, attitudes, or views within that community. A cross-sectional study generalizes findings from a sample to the entire population by employing questionnaires or structured interviews, assessing variables at a single moment in time and establishing their correlations (Driessnack et al., 2007).

Data Source and Collection

An online survey was conducted to obtain a random sample of respondents. Online or internet-based surveys are currently the most common way to gather survey data globally, surpassing more traditional techniques like mail, in-person interviews, and landline polls (Smith et al., 2016). The advent of technology allows for the engagement of larger groups of human participants than was previously feasible. Connectivity also offers unique benefits in the study of human behavior, most notably through the recently established online labor market known as MTurk (Goodman et al., 2013).

The survey was classified as a convenience sample because participant selection was based on their availability and desire to partake in the study. The researcher cannot claim with certainty that the people in this situation are typical of the general population, but valuable data is gained for addressing queries and hypotheses (Creswell & Guetterman, 2019). In exchange for little compensation ($0.05–$0.25), MTurk, a web-based data-collecting service operated by Amazon.com, recruited study volunteers. Because of its effectiveness and low cost, and the ease

of securing participants, MTurk has drawn the attention of social science researchers as a cost-effective way to gather human research subjects.

The population chosen for this study was U.S. residents over the age of 18. MTurk's online survey settings prevented individuals residing outside the United States from participating in this study. To reduce noise, the study focused on U.S. residents' exposure to and willingness to use telemedicine. That said, no attempt was made to target a specific demographic or socioeconomic group in the United States.

The researcher created a membership account with MTurk. The survey was created on Qualtrics and posted on the MTurk website, allowing the solicitation of random responses from the marketplace's registered workers. The members of MTurk who were based in the United States and agreed to the terms of the informed consent were allowed to proceed with the study. General demographic information about the participants, including age, marital status, gender, education, and income, was collected as part of the Qualtrics survey. See Appendix A for ethical considerations.

Online Survey Quality

To support the expansion of online panel databases and user access, business and social science scholars frequently accept convenience samples as long as they meet research objectives and are indicative of a target market (Smith et al., 2016). Between MTurk and community samples, conventional social science research samples, internet samples, non-student adult samples, and the U.S. population, similarities and disparities were identified regarding demographics. The MTurk sample's demographics, including gender, ethnicity, and educational attainment, were more representative of the U.S. population than those of conventional subject pools (Burnham et al., 2018).

Rand (2012) discovered that MTurk users' demographic responses were reliable and consistent. For instance, IP address-matching revealed that the claimed country of residence for MTurk users was accurate more than 95% of the time. There is a reasonable concern that unemployed persons or workers in knowledge fields might be overrepresented among MTurk respondents; but in general, the proportion of MTurk respondents who work in particular sectors is comparable to that of other research survey pools.

For MTurk, the percentage of people who were employed as professionals varied between 12% and 16% (Huff & Tingley, 2015). The Goodman et al. (2013) study involved 60 community sample participants from a middle-class urban area who were each paid $5 to complete a similar survey with paper and pencil and $0.10 for MTurk survey participants. Researchers discovered that MTurk users paid just as close attention to the questions as the community sample, demonstrating that both groups were equally likely to read and follow instructions, were equally skilled at solving complex problems, and that the MTurk group were more likely to fact-check their online responses (Goodman et al., 2013).

Population

The target population consisted of adults in the United States, aged at least 18 years, who were active on the MTurk platform. According to 2020 United States Census data, the total population of adults over the age of 18 in the US was approximately 258.3 million. Based on this data, it was estimated that the population of US adults who were at least 18 years old and had either used or were potential users of telemedicine was around 95.5 million, representing approximately 37% of the total adult population (Lucas & Villarroel, 2022). The study included participants on MTurk who met the criteria of residing in the United States and 18 years or older, with no specific emphasis on the type of telemedicine technology they had experienced. The

primary criterion for inclusion was that participants needed to be at least 18 years old and registered as MTurk members.

MTurk filters were applied to narrow the pool of survey respondents to individuals with IP addresses originating from the United States. To ensure a common understanding of telemedicine among survey participants, telemedicine was defined as follows: *Telemedicine lets your healthcare provider care for you without an in-person office visit. Telemedicine is primarily done online with internet access on your computer, tablet, or smartphone*. A prior history of using telemedicine technologies or applications was not considered a disqualifying factor. Participants who did not meet the minimum age requirement of 18 years or those who resided outside the United States were excluded from the study, via MTurk-applied parameters. Using these criteria for participant selection was deemed the most optimal strategy for addressing the research problem in this study.

Sample Size

In any research, the choice of sample size is fundamentally a trade-off; a larger sample increases the conclusions' accuracy, but expanding the sample requires more time and money (Creswell & Creswell, 2017). According to the central limit theorem, a breach of normality is not a significant problem when the sample size comprises 100 or more observations (Mishra et al., 2019). A power analysis can help determine the desired sample size if the analysis plan aims to find a meaningful correlation between two variables of interest. There are several power analysis calculators accessible, both for purchase and for free online. The survey design study's objectives determine the input values for a formal power analysis (Creswell & Creswell, 2017).

Power analysis assesses the confidence level that should be attributed to research results when the null hypothesis is not rejected. A higher magnitude of power indicates a higher level of confidence that there is no substantial distinction between the groups under consideration

(Pallant, 2020). The significance level determines the calculation of the population effect size α, statistical power 1 – β, and sample size (Faul et al., 2009). A commonly used alpha value is 0.05, which signifies a five percent probability of making a Type I error. This means that in five percent of cases, one may incorrectly conclude the presence of a significant association between variables when, in reality, this association results from chance and lacks substantive validity (Creswell & Creswell, 2017).

The type II error concerns the risk a researcher is willing to accept in incorrectly concluding that there is no significant impact, even when a substantial relationship exists. It represents the probability of making a false negative error. Researchers often seek to find a balance between the risks associated with type I and type II errors. In the academic community, a beta value of .20 is widely accepted, resulting in an estimated power of 0.80, equivalent to 1 – beta (where 1 – 0.20 = 0.80) (Creswell & Creswell, 2017). Given a significance level (α) of .05 and a power of .80, resulting in β (type II error) equal to .20, the ratio of the seriousness of type I to type II error is calculated as β / α, which yields a value of .20/.05 = 4 to 1. This indicates that the erroneous rejection of the null hypothesis is considered four times as serious as the erroneous acceptance of it (Cohen, 1977).

A power analysis using Statistical Package for the Social Sciences (SPSS) was conducted to determine the sample size required for the multiple regression analyses. The sample size was determined with an effects size value of .394, six (6) predictors in the model, a type I error rate set at α = 0.05, and a type II error rate set at β = 0.05 (intended power of 95%). The relative seriousness of type I to type II error is β / α = .05/.05 = 1 to 1. The results of this power analysis suggested a target sample size of 57 total participants. The final sample of 278 participants exceeded the power analysis requirement and guaranteed the results' reliability.

Measures

Age

Age has been identified as a critical characteristic of decision-makers, influencing their information-processing abilities. It is recognized that age has a notable impact on both the process and quality of decision-making (Taylor, 1975). Understanding how age influences preferences may provide insight into why older study participants were more inclined than younger ones to express positive perceptions of patient-provider communication measures highly valued by this age group. However, fewer differences were observed regarding autonomy in healthcare decision-making and control over treatment decisions (DeVoe et al., 2009). Survey participants were asked to provide their ages in years, and parameters were established to limit the MTurk survey to participants 18 years and older.

Income Loss

Income loss was measured with a direct yes or no response to the question [Do you lose income when you attend medical visits (such as having to take the day off from work and not being paid for that day)]? The amount of income lost was less significant than identifying that attending an in-person medical appointment caused the loss of income. Survey participants who lost income when attending a medical visit faced an opportunity cost decision: Does the medical service outweigh the income lost to attend the appointment? Researchers have investigated the issue and demonstrated that, after accounting for health status, individuals with lower incomes tended to have less frequent doctor visits than those with higher incomes. It is important to consider health status when making such comparisons, as failing to do so can be misleading. Income often reflects the impacts of health status, as individuals with lower earnings typically experience poorer health (Allard, 1993).

Trust

The patient may trust doctors because they are seen as allies who genuinely care about the patient's health. A trustworthy connection can facilitate a more fluid information flow between the patient and the doctor, improve issue resolution, and promote collaborative decision-making (Katz, 2021). Trust in doctors is measured through survey questions that assess patients' perceptions of medical doctors rather than their specific medical practitioner. As the utilization of telemedicine continues to increase, there is a growing significance in exploring how patient trust can influence the effectiveness of telemedicine interactions.

The Wake Forest physician trust scale is used to assess patients' trust in doctors; the results demonstrate high internal consistency (alpha = .93). A sample question is: "[Your doctor] is totally honest in telling you about all of the different treatment options available for your condition" (Hall et al., 2001, p. 625). Understanding patient trust in doctors is crucial, as it forms the foundation of the patient-physician relationship and influences their willingness to utilize telemedicine. Through studying patient trust in physicians, valuable insights can be gained to enhance the effectiveness and quality of remote healthcare delivery (Ivy, 2018).

Time

Time was measured using travel time to a medical appointment. The marginal productivity theory of factor reward provides theoretical support for this strategy, which implies that the wage rate is a good indicator of the marginal or incremental value of an extra hour's work and assumes that employers effectively utilize the time saved by employees due to reduced travel (Cherlow, 1981). Possible responses ranged from less than 10 minutes to more than two hours. Individuals with a higher opportunity cost-of-time tended to opt for less time-intensive treatment. Working

individuals and those with more significant time opportunity costs often prefer private physician care over time-intensive outpatient departments and hospital treatments (Acton, 1975).

Computer Self-Efficacy

Computer self-efficacy, as described by Venkatesh (2008), is the individual's self-perceived competence in performing specific computer-related skills or tasks. This was assessed based on participants' utilization of computer technology. The survey participants' comfort with technology was regulated by their CSE, given that the survey was administered online through MTurk. The researcher anticipated that participants may possess a higher confidence level in utilizing technology, potentially introducing a bias that could impact the survey results.

Reliability

For the trust in doctors scale, several items were used. As such, reliability needed to be determined. Cronbach's alpha, introduced by Lee Cronbach in 1951, serves as a crucial metric for evaluating the internal consistency of a test or scale and is one of the most popular methods for evaluating the reliability of an internal consistency reliability coefficient (Weinberg & Abramowitz, 2016). This numerical value, ranging from zero ($\alpha = 0$) to one ($\alpha = 1$), gauges the extent to which all items within a test measure a consistent concept or construct, revealing the interconnectedness of these items (Tavakol & Dennick, 2011). Researchers, mainly when designing and testing new survey instruments, commonly employ Cronbach's alpha to assess the quality of their tools (Frost). It is a widely accepted practice within the research community, with a guideline indicating that composite reliability values < .7 demonstrate the reliability of the examined constructs, aligning with established standards in prior research (Hair et al., 1995; Nunnally, 1975).

Table 1
Reliability Statistics

CRONBACH'S ALPHA	*N* OF ITEMS
.917	6

Based on the high alpha value of .93 reported by Hall et al. (2001) using the Wake Forest physician trust scale, there are concerns about the potential unidimensionality and measurement of a single trait in the questions assessing patients' trust in physicians. Prior research recommends using the Cronbach alpha test to assess data reliability, particularly in a Likert-scale survey (Mozhayski, 2022). The internal consistency of survey questions in Table 2 was evaluated using the alpha formula, resulting in a high value of .917 (Table 1) and a 15.9% error variance in the scores (Kline, 1994). A higher alpha value (i.e., closer to 1) indicated increased reliability (Chan & Idris, 2017). This suggested that having the value of one response provided complete information about the other items (Frost) and contributed to the formulation of a reduced-scale trust.

Table 2
Trust in Physicians Survey Questions

ITEM	Source
How much do you agree with the following statement? "Doctors in [general] care about their patients' health just as much or more as their patients do."	(Hall et al., 2001) (modified)
How much do you agree with the following statement? "Doctors are extremely thorough and careful."	(Hall et al., 2001)
How much do you agree with the following statement? "I completely trust doctors' decisions about which medical treatments are best."	(Hall et al., 2001)
How much do you agree with the following statement? "Doctors are totally honest in telling their patients about all of the different treatment options available for their conditions."	(Hall et al., 2001)
How much do you agree with the following statement? "Doctors think only about what is best for their patients."	(Hall et al., 2001) (modified)
How much do you agree with the following statement? "Doctors always use their very best skill and effort on behalf of their patients."	(Hall et al., 2001) (modified)

CHAPTER IV

RESULTS

Demographic Information

Frequency statistics are crucial in quantitative data analysis. They tabulate the occurrences of each variable, focusing on both the count and proportion of these events. Table 3 presents a comprehensive overview of the respondents' demographics, encompassing gender, marital status, race, education, household income, and pay type. This detailed breakdown provides a foundation for in-depth statistical examinations and ensures a comprehensive understanding of the research context (Mishra et al., 2019).

The study's participants exhibited a diverse demographic profile. Gender distribution reflected a balanced representation, with 56.1% identifying as female and 41.4% as male, while a smaller percentage identified as nonbinary or chose not to disclose. Marital status indicated a majority of married participants (76.7%), alongside individuals who had never married (16.4%). The racial composition highlighted a predominant representation of White (non-Hispanic) respondents at 75.5%, with significant contributions from other racial groups. A substantial proportion of respondents were college-educated, with 37.1% holding graduate degrees and 41.1% completing college degrees. Household income distribution varied, with 24.8% of participant households earning in the $60,000–$79,999 range. Among the respondents, 93% were employed (75.7% salaried, 17.4% hourly), while 6.9% were unemployed.

Table 3

Demographics of Respondents

		FREQUENCY	PERCENT	CUMULATIVE
Gender	Male	115	41.4	41.4
	Female	156	56.1	97.5
	Nonbinary/other gender	4	1.4	98.9
	Prefer not to say	3	1.1	100.0
Marital Status	Married	211	76.7	76.7
	Widowed	6	2.2	78.9
	Divorced	10	3.6	82.5
	Separated	3	1.1	83.6
	Never married	45	16.4	100.0
Race	White (Non-Hispanic)	210	75.5	75.5
	Black or African American	22	7.9	83.5
	American Indian or Alaska Native	8	2.9	86.3
	Asian	28	10.1	96.4
	Native Hawaiian/Pacific Islander	1	.4	96.8
	Hispanic	6	2.2	98.9
	Other	3	1.1	100.0
Education	Less than high school degree	3	1.1	1.1
	High school or equivalent (GED)	30	10.9	12.0
	Some college or AA degree	27	9.8	21.8
	College degree	113	41.1	62.9
	Graduate degree	102	37.1	100.0
Household Income	Under $20,000	20	7.2	7.2
	$20,000–$39,999	54	19.4	26.6
	$40,000–$59,999	56	20.1	46.8
	$60,000–$79,999	69	24.8	71.6
	$80,000–$99,999	45	16.2	87.8
	$100,000–$119,999	18	6.5	94.2
	$120,000–$139,999	3	1.1	95.3
	$140,000 or more	13	4.7	100.0
Pay Type	Salary	209	75.7	75.7
	Hourly	48	17.4	93.1
	Unemployed	19	6.9	100.0

Research Technique

The multivariate linear regression approach is a powerful method utilized to assess the association between a single dependent variable and multiple independent variables, enabling the forecasting of the dependent variable's value based on independent factors (Horne, 2017). When a model with a single predictor is insufficient to accurately depict the actual relationship between the dependent variable and its potential predictors, the use of multiple regression becomes necessary (Doane & Seward, 2016). The development of multiple regression further enhances the analytical capabilities, allowing for the examination of situations involving three or more variables.

Regression analysis aims to draw meaningful conclusions about the population regression function by leveraging the sample regression function (Gujarati, 2014). This process involves applying statistical techniques to analyze and interpret the relationships between variables, providing beneficial insights into the dynamics underlying the phenomenon under investigation (Daniels & Minot, 2019). This research utilized a multivariate regression analysis to explore the factors influencing patients' inclination toward adopting telemedicine. This comprehensive regression study aimed to ascertain significant correlations among variables such as exposure, age, income loss, trust in physicians, travel time, and CSE with patients' intentions to use telemedicine.

Data Analysis

The data obtained from the Qualtrics platform were analyzed using the Statistical Package for the Social Sciences (SPSS) software 22, specifically for linear regression. This linear regression analysis assessed and predicted the relationship between the patient's exposure to telemedicine, age, trust in physicians, travel time, loss of income, CSE (control), and the patient's intention to use telemedicine. The data underwent multiple linear regression analyses to

determine the mathematical relationship between variables. Linear regression is a statistical method used to model the relationship between a dependent variable and one or more independent variables by fitting a linear equation to the observed data. Univariate linear regression involves a single independent variable, while multivariate linear regression involves multiple independent variables. The goal is to find the best-fitting linear relationship that allows predictions or explanations of the dependent variable based on the chosen independent variables (Yang et al., 2023).

The SPSS linear regression analysis included testing hypotheses related to *R*-squared values, coefficients for each factor, and *P*-values for each coefficient. A Pearson correlation (Table 6) was also performed to assess the relationships between the variables.

The control variable's regression model was significant; F (1, 255) = 96.578, $p < .001$, R2 = .23 (see Table 4). This model accounted for 23% of the total variation and indicated a strong relationship between the independent and dependent variables. By isolating the effect of the control variable on the dependent variable, the influence of the independent variables reveals causal arguments by eliminating the influence of alternative explanations (Li, 2021).

Table 4

Control ANOVA Results (N = 257)

	Sum of Squares	Df	Mean Square	*F*	Sig
Regression	96.578	1	96.578	76.014	< .001
Residual	323.983	255	1.271		
Total	420.560	256			

The regression model was statistically significant; F (6, 250) = 27.073, $p < .001$, R2 = .394, with an adjusted R2 = .164 (see Table 5). At least one predictor variable in the model significantly affected the dependent variable. The *F*-statistic indicates a strong overall relationship between the predictors and the dependent variable. An additional 16% of the

variance in intent to use telemedicine is accounted for by exposure to telemedicine, age, income loss, trust in doctors, and travel time. The individual predictors were examined further and indicated that exposure to telemedicine ($t = 2.90$, $p < .004$) was a significant predictor, age ($t = 1.44$, $p < .152$) was not a significant predictor, income loss ($t = –3.04$, $p < .003$) was a significant predictor, trust in doctors ($t = 5.21$, $p < .001$) was a significant predictor, travel time ($t = 4.22$, $p < .001$) was a significant predictor, and CSE (control) ($t = 6.93$, $p < .001$) was a significant predictor.

Table 5

ANOVA Results (N = 257)

	Sum of Squares	Df	Mean Square	*F*	Sig
Regression	165.636	6	27.606	27.073	< .001
Residual	254.925	250	1.020		
Total	420.560	256			

Exposure exhibits positive correlations with trust and CSE, suggesting that enhancing exposure, CSE, and trust could mitigate barriers. Income loss is a potential barrier, demonstrating a strong negative correlation with trust and travel time, suggesting that higher income loss is associated with lower levels of trust and increased travel time. Patients experiencing income loss may be less likely to trust or commit time to telemedicine. Additionally, trust is positively correlated with exposure, income loss, travel time, and CSE, underscoring the interconnected nature of these variables. These correlation patterns provide valuable insights into the relationships among exposure, income loss, trust, travel time, and CSE, contributing to an improved understanding of the survey results.

Figure 2

Final Multiple Regression Model Forecasting Intention to Use Telemedicine. Betas are Included.

***= <.01*

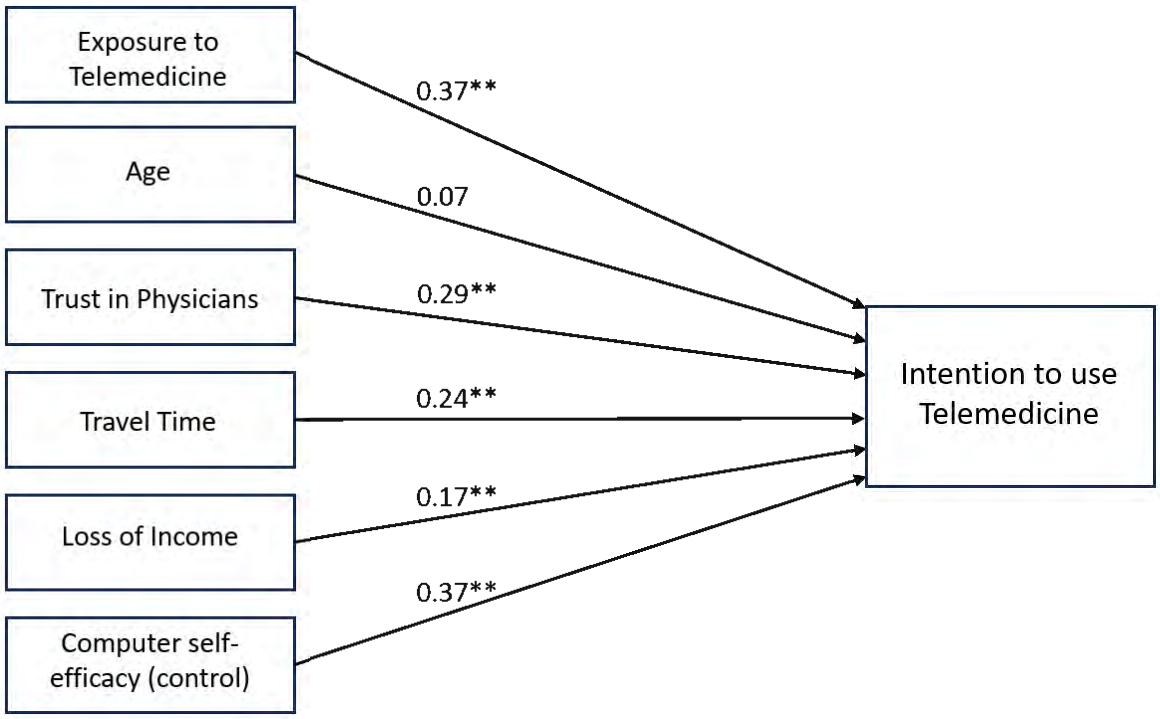


Table 6 overviews crucial telemedicine adoption variables, including means, standard deviations, and correlations. These statistical insights contribute to an understanding of the dynamics influencing the intention to use telemedicine. The findings reveal a consistent pattern of moderately high exposure to telemedicine (mean = 10.12, SD = 1.17) among participants, emphasizing a noteworthy level of familiarity within the sample. This heightened exposure is pivotal in shaping participants' perceptions and readiness to adopt telemedicine, providing essential context for further analysis.

Table 6

Means, Standard Deviations, and Correlations

		MEAN	STANDARD DEVIATION	1	2	3	4	5	6
1	Exposure	10.12	1.17	1	–.07	.04	.17**	.06	.23**
2	Age	39.85	15.94	–.07	1	–.06	–.04	–.09	–.06
3	Income Loss	1.26	0.43	.04	–.06	1	.29**	.45**	–.08
4	Trust	2.43	1.03	.17**	–.04	.29**	1	.29**	.26
5	Travel time	29.45	1.36	.06	–.09	.45**	.28**	1	.01
6	Computer self-efficacy	1.98	1.04	.23**	–.06	–.08	.26**	.01	1

*= < .05, **= < .01,

The average age of respondents is 39.85 (SD = 15.94), reflecting a diverse age group and capturing a broad demographic range. This diversity is integral to comprehending how different age cohorts may perceive and engage with telemedicine services. Participants reported losing income when attending medical visits (mean = 1.26, SD = .43), suggesting concerns about financial loss inhibiting them from attending medical appointments. This observation could indicate patients consider costs when deciding to attend appointments, illustrating the economic circumstances influencing the adoption of telemedicine.

Trust in physicians, a critical factor in telemedicine acceptance (mean = 2.43, SD = 1.03), reported a standard deviation indicating a mostly positive degree of physician trust among respondents. The variance in trust levels illustrates the need for an in-depth examination of factors contributing to or detracting from trust in physicians. The correlations further illuminate these dynamics. The positive correlation between exposure and trust ($r = .17$, $p < .01$) suggests that individuals with higher exposure to telemedicine tend to have higher trust in physicians.

Participants reported that travel times influenced their decision to attend medical appointments (mean = 29.45, SD = 1.36), a factor that positively influences a patients'

willingness to adopt telemedicine services, particularly considering the convenience and accessibility promises of telemedicine. The mean for CSE is 1.98 (SD = 1.04), indicating a moderate confidence level in using technology, especially noteworthy as the survey was conducted online. The correlation between CSE and exposure ($r = 0.23$, $p < 0.01$) underscores the association between exposure to telemedicine and increased CSE, signaling that a patient with technological confidence and knowledge of telemedicine are more likely to use the service.

Table 7 shows that the regression model demonstrates statistical significance, affirming its suitability as a model for the dataset. Trust, time, exposure, CSE, and loss of income are significant predictors influencing the intention to use telemedicine. These variables explain the variance, within the survey results, in the intention to use telemedicine. Trust, time, exposure, and CSE are significant predictors, implying that these variables are vital in overcoming barriers to telemedicine adoption.

Table 7

Regression on Intention to Use Telemedicine

	STANDARD ERROR	STANDARD BETA	*t*	SIGNIFICANCE
(Constant)	1.57		–4.62	0.00
Age	0.00	0.07	1.44	0.15
Trust	0.07	0.29	5.21	0.00
Time	0.05	0.24	4.22	0.00
Exposure	0.06	0.15	2.90	0.00
Computer self-efficacy	0.06	0.37	6.93	0.00
Loss of income	0.17	0.17	–3.04	0.00

R2 = 0.394

Loss of income continues to demonstrate as a variable that is a barrier affecting the intention to use telemedicine in the regression analysis. Age does not emerge as a statistically significant predictor in this analysis, suggesting that within the survey sample, age may not

significantly influence the intention to use telemedicine. These findings provide insight into the factors shaping individuals' intention to use telemedicine, providing a nuanced understanding of the predictive dynamics for the given variables.

Hypothesis 1 predicted that exposure to telemedicine would increase intention to use telemedicine. This hypothesis was supported. Hypothesis 2 predicted an inverse relationship between age and intention to use telemedicine. This hypothesis was not supported. Hypothesis 3 predicted that as income loss from attending office visits increases, the intention to use telemedicine would increase. This hypothesis was supported. Hypothesis 4 predicted that participants who reported higher levels of trust in doctors would report a higher intention to use telemedicine. This hypothesis was supported. Hypothesis 5 predicted that participants who needed to travel longer to attend office visits would report higher intention to use telemedicine. This hypothesis was supported. The following section discusses the findings and implications for researchers and practitioners, limitations, and future research avenues.

Interpretations

Trust emerged as a pivotal factor in the analyses, exhibiting positive correlations with multiple variables and significantly influencing the intention to use telemedicine. Exposure, CSE, and time consistently demonstrated their influential roles in predicting the intention to use telemedicine across different contexts. Income loss revealed a positive interconnectedness with travel time, indicating that financial considerations were associated with telemedicine adoption. The relationships underscore the multifaceted nature of factors contributing to individuals' intentions to adopt telemedicine, offering valuable insights for policymakers and healthcare practitioners.

The research unveiled several pivotal insights, highlighting potential barriers to and drivers for telemedicine adoption. Foremost among these is the critical role of trust, where a

deficit poses a significant hurdle. Developing effective strategies to instill confidence in telemedicine services becomes paramount to promoting adoption. The impact of income loss underscores the centrality of economic considerations, emphasizing the necessity of addressing financial aspects in order to enhance affordability and accessibility. The correlation among exposure, computer self-efficacy, and the inclination to adopt telemedicine suggests that increased exposure and improved computer self-efficacy positively influence the likelihood of adoption. The survey results underscore the potential benefits of medical staff educating patients and training local health departments in mitigating adoption barriers.

Finally, the significance of time implied that convenience and efficiency were critical elements in overcoming adoption obstacles, highlighting the imperative for user-friendly and time-efficient telemedicine systems. These combined findings offer comprehensive insights that can guide policymakers, healthcare practitioners, and technology developers. By working together, they can implement user-centric design principles, streamline administrative processes, and optimize reimbursement structures, all of which can incentivize widespread telemedicine adoption.

Discussion

This study sought to understand the factors influencing patients' intention to use telemedicine, a well-established yet not widely adopted alternative to physician office visits. The study found significant relationships between exposure to telemedicine, trust in physicians, travel time concerns, and lost income due to office visits, and the intention to utilize telemedicine services. However, respondent age did not significantly impact the intention to use telemedicine.

Hypothesis Review

As expected in Hypothesis 3 and Hypothesis 5, the inconvenience associated with attending office visits, that is both travel time and loss of income, drove participants to consider

virtual encounters with their care providers. This does not suggest that these participants believed that the quality of care that they received in a virtual visit was comparable to what they might receive at an office visit. Instead, it indicated that for many individuals, virtual visits were acceptable substitutes for office visits in circumstances in which office visits are inconvenient.

Also, as predicted in Hypothesis 4, higher trust in physicians led to higher intention to use telemedicine. Consequences of an ineffective medical visit can be catastrophic for patients that can result in a missed diagnosis of a severe disease which could lead to a substantial loss of quality of life; therefore, patients may be uncomfortable forgoing the richness of a close, hands-on visual examination, in which samples can be taken immediately and often analyzed in minutes. Further, if a patient views doctors as lazy or money-driven and trying to see as many patients as possible, they may be concerned that during telemedicine encounters, they do not have enough of the physician's attention to achieve the goal of the encounter.

Exposure to Telemedicine

Understanding patient attitudes and their influencing factors is crucial for successful telemedicine implementation. Patients are willing to use telemedicine in various medical contexts, from primary care to cancer treatment. Patient attitudes, satisfaction with current treatment, and their relationship with their doctor significantly influence their willingness to embrace telemedicine. The mere exposure effect suggests repeated exposure to a stimulus increases the likelihood of positive evaluation. The statistical results for exposure in Table 7 indicated a significant relationship between exposure to telemedicine and the intention to use it, highlighting the potential impact of repeated exposure on patient perceptions and preferences related to telemedicine.

Influence of Age

A *T*-value of 1.44 is relatively modest, and the accompanying non-significant *p*-value (0.15) suggests that the observed *T*-value is not extreme enough to reject the null hypothesis. This indicates that age may not be statistically significant in predicting the outcome in the model. This study predicted that older participants would be less inclined to use telemedicine because the researcher assumed they would be less comfortable with technology (H2). There are multiple explanations for why this hypothesis was not supported. First, older individuals may be more likely to have mobility challenges, making visiting the physician in person more difficult, thus leading some of them to prefer the convenience of a virtual encounter. Also, older individuals are more likely to have multiple and complex medical needs, causing them to require more frequent medical visits than younger patients.

Individuals with frequent medical visits, and thus more experience interacting with their physician, may be more capable of effectively communicating with their physician using leaner media. This explanation is consistent with channel expansion theory (Carlson & Zmud, 1999), which suggests that as communication participants become more familiar with each other, the topic of the communication, and the media, they can effectively convey a richer understanding using leaner media. Older patients, who populate many rural areas in the United States, often prefer face-to-face medical care, associating it with increased family involvement and potentially better treatment outcomes (Mattson, 2011). There is a trust built over years of care that cannot easily be replicated within the impersonal nature of telemedicine.

An inverse relationship was expected between age and intent to use telemedicine. An inverse correlation relationship describes a statistical association between two variables. One variable tends to increase as the other decreases, and vice versa. An opposite or contrary

movement characterizes the relationship between the two variables. Younger patients, known for their enthusiasm for technology, would gravitate to telemedicine to meet their limited medical needs. As age advances, the inclination to embrace telemedicine continues to decrease yearly, with a significant drop observed in the older age groups. This decline in interest among older patients could be attributed to concerns about the perceived impersonality of the service, decreased CSE, and a preference for more traditional, face-to-face interactions in healthcare.

Finally, the assumption that older participants are less technologically competent may not be accurate in 2023, when the data were collected. With this in mind, CSE may be a better indicator of adoption than age. Computer self-efficacy was included as a control and found to have a significant impact on intention to adopt telemedicine and was not significantly correlated with age (the correlation was –.06). Indeed, COVID has improved most people's computer abilities (König & Seifert, 2022).

An Omnichannel Approach to Healthcare

The retail industry witnessed a transformative shift in consumer experience from the 1990s to the early 2000s, marked by the growth of digital retailing technology that provided companies with new avenues to connect with their customer base. This era transitioned from a singular to an omnichannel retail environment. In a single-channel setup, retailers operate through a lone market channel, such as a catalog or a brick-and-mortar location. However, numerous department stores embraced an omnichannel strategy to engage consumers through various channels simultaneously. Healthcare organizations must adopt the same omnichannel distribution approach by incorporating telemedicine into their service offerings.

An omnichannel approach involves both a telemedicine presence and physical locations where patients can receive continuous medical services. The dot-com era introduced an online access point for a global customer base, expanding access to the omnichannel marketplace and

laying the foundation for omnichannel healthcare services. Coined by Rigby (2011), omnichannel defines the multiple access points that retailers have to reach their consumer base. As retail consumers comfortably navigate online and in-person retail experiences, healthcare organizations must integrate their healthcare offerings to achieve similar adoption rates among their patient population.

The proper omnichannel healthcare patient experience seamlessly coordinates online and in-person interactions, presenting a synergistic healthcare management method that integrates patient medical service channels and touchpoints. This approach optimizes healthcare outcomes and enhances the patient experience across the healthcare continuum (Verhoef et al., 2015). Melero et al. (2016) identified crucial factors for organizations aiming to deliver a superior consumer experience. Embracing a customer-centric strategy involves consolidating touchpoints across all channels; providing tailored customer experiences; integrating available channels; delighting customers consistently; redefining the role of physical stores; and embracing mobile marketing.

Telemedicine Integration

Healthcare companies must recognize that optimizing the financial outcomes of the Affordable Care Act involves a concentrated focus on patient needs. In the competitive landscape of patient service, leveraging online consumer-centricity provides a strategic advantage over traditional brick-and-mortar rivals (Shah et al., 2006). The ongoing expansion of telemedicine significantly impacts in-person medical organizations, potentially leading to the consolidation of medical practices into larger healthcare entities. It is essential to note that telemedicine cannot entirely replace the in-person patient experience. Omnichannel medical businesses should adopt a patient-centric approach, understanding patients' cross-channel usage

patterns. Healthcare administrators need to identify and prioritize the most desirable patient experiences to capture every dollar seamlessly within the realm of medical care (Shi et al., 2020).

The effectiveness of an omnichannel healthcare organization hinges on efficient integration across channels to optimize performance and enhance the patient healthcare experience, mitigating the risk of disjointed care. The success of this strategy is contingent upon the quality of channel integration and the seamless delivery of healthcare services through each channel. Lee et al. (2019) emphasized the critical role of channel integration quality in shaping engagement, ultimately contributing to positive outcomes. Patients should receive consistency in medical service, a continuum of care across a borderless, medical-channel service system, and the ability to fulfill appointments online or in the doctor's office.

Contact Management

Every positive interaction with patients can enhance the overall healthcare experience, fostering a willingness among patients to embrace telemedicine through successful medical touchpoints. Shen et al. (2018) presented an alternative definition of omnichannel as describing a cohesive approach, treating channels as interconnected touchpoints that enable consumers to experience a seamless journey within an integrated ecosystem. Achieving a positive experience and reshaping patient behavior necessitates breaking down barriers between medical channels (Shen et al., 2018). The unification of cross-channel touchpoints is a fundamental aspect of a successful omnichannel marketing strategy (Melero et al., 2016), emphasizing the identification of patients across different channels and prioritizing the patient touchpoint experience over the success of individual medical service channels.

Considerations for telemedicine are shaped by one-way and two-way touchpoints involving medical practitioners and customers. These interactions can occur in-person, online,

for example, through websites, social media, internet advertisements, or SMS text, or through word-of-mouth communication (Tyrväinen & Karjaluoto, 2019). Achieving alignment across these diverse touchpoints requires systematic modifications to various strategies and operations, regardless of the specific touchpoint (Huré et al., 2017). This comprehensive approach should, in turn, contribute to an increased adoption of telemedicine by patients.

The potential integrated nature of omnichannel healthcare fosters a personalized medical experience through various channel touchpoints. Increased patient usage data enhances behavioral segmentation, providing a deeper understanding of patient medical service patterns and reducing future telemedicine investment risks. Utilizing these data points enables the creation of health service access recommendations, targeted advertisements, and insights into preferred patient availability, guiding decision-making for healthcare service channels. More personalized treatment options are anticipated to overcome willingness barriers and minimize patient-perceived telemedicine risks.

Experience

The patient medical experience and channel access experience are interchangeable terms. Brakus et al. (2009) conceptualized the retail brand experience as the subjective, internal responses of consumers, including sensations, feelings, and cognitions, alongside their behavioral responses prompted by brand-related stimuli integrated into a brand's design and identity, packaging, communications, and environments. Healthcare organizations must carefully manage patient touchpoints to provide a consistent medical experience across all channels, minimizing adverse consequences of telemedicine usage to maximize patient retention.

Practical Implications and Future Research

Advocates for telemedicine seek to increase adoption in order to reduce the burdens on the healthcare system, while encouraging better health outcomes by removing barriers to seeing a

physician. Understanding the implications for the medical infrastructure assists policymakers in determining the allocations of billions of dollars in annual federal funds for critical public services. Telemedicine has the potential to enhance healthcare accessibility and quality while also reducing costs. End users are more likely to embrace telemedicine services integrated into their daily clinical practices and feel familiar with them. They evaluate the benefits and drawbacks of the service, enabling them to form an informed opinion (Jansen-Kosterink et al., 2019). According to Gaudette et al., "spending per beneficiary is expected to grow by a factor of 1.6 for all elderly age groups, reaching $10,800 annually (in 2009 dollars) for the 65–74 age group; $15,900 for the 75–85 group; and $19,800 for beneficiaries older than 85" (2015, p. 9).

Currently, telemedicine adoption by patients is relatively low, however, it is growing, indicating the potential to steadily increase its prevalence, resulting in the desirable outcomes identified above. The finding that exposure to telemedicine increases intention to adopt it suggests that insurance companies and medical practitioners should promote its benefits. Information campaigns highlighting success stories and encouraging patients to share their experiences could be a powerful tool. Word-of-mouth promotion can effectively increase exposure to virtual visits, socially normalize them, and ultimately achieve the potential advantages of telemedicine. Researchers should consider employing marketing theories, particularly related to branding, word of mouth, and even campaigning from the political science literature, to find practical ways of increasing exposure to telemedicine.

Findings did not support a relationship between age and intention to use telemedicine (H2). However, a relationship between CSE and intention to use telemedicine was identified. Further, CSE and intention to use telemedicine were not correlated. While there are multiple explanations for this, and each explanation carries its implication for advocates of telemedicine,

the finding itself implies two considerations. First, given that age does not serve as a reliable proxy for technological adeptness, advocates for telemedicine should not confine their messaging to older individuals. Second, because CSE is a determinant of intention to use telemedicine, digital channels such as e-mail, social media, and influencers may not be as effective at reaching those most resistant to the adoption of telemedicine. Instead, traditional media such as television commercials, newsprint, billboard advertising, and flyers may be more helpful at reaching the less technologically inclined. The relationship between age and attitudes toward telemedicine appears more nuanced than comfort and capability with technology. This study did not provide evidence to support any potential explanations for the lack of support for Hypothesis 2, as discussed earlier.

Support for inconvenience factors (H3 and H5) influencing the intention to use telemedicine was found. Researchers should examine the relationship between age and telemedicine, particularly among those with frequent medical visit, by asking: Could the inconvenience of persistent medical visits drive older individuals to prefer virtual visits to office visits? Additionally, in light of channel expansion theory, researchers may examine whether repeated and frequent medical visits improve the ability to communicate rich messages using lean media. Finally, they may examine whether the complex and evolving medical issues associated with older patients make telemedicine less effective at providing care. If so, a situation might exist in which older patients prefer telemedicine because it is convenient and they are confident they can communicate effectively; however, the odds of a missed diagnosis may be higher.

Findings supported relationships between inconvenience factors, H3: lost income and H4: lost time to attend office visits, and intention to adopt telemedicine. Visiting physicians in person

is inconvenient for multiple reasons: scheduling can be challenging, wait times can be unexpected and substantial, and clinic hours are often limited to regular business hours. This finding does imply that if office visits become more inconvenient, telemedicine adoption is likely to increase. Further, advocates for telemedicine can highlight the relative benefits of telemedicine in terms of convenience in their messaging to effectively appeal to patients who find office visits inconvenient.

Findings supported Hypothesis 4, showing that patients with greater trust in doctors reported higher intention to use telemedicine. This indicates that efforts to encourage telemedicine adoption should focus on building awareness of the capabilities of telemedicine and the convenience of virtual encounters and building trust in physicians in general and physicians who offer telemedicine in particular. Doing so alleviates some of the concerns of those who are reluctant to replace an office visit with a virtual visit because they fear that the physician may be simply trying to see as many patients as possible, leading to a lack of full attention where important medical observation may be missed. Indeed, telemedicine is limited in many ways, as it is impossible to take blood samples, throat swabs, skin biopsies, or X-rays during a virtual visit.

Suppose the discussion and visual inspection via a videoconference indicates that further testing is necessary? In that case, the patient needs to make an appointment at a lab, likely incurring an additional cost. This shortcoming poses a challenge to the ongoing adoption of telemedicine. That said, external labs are becoming more frequent (Plusch & Muir, 2023). This finding also carries implications for researchers, as it stresses the importance of understanding the drivers of patient trust in physicians, including different types of trust, particularly empathy or identification-based trust, which likely influences the extent to which patients believe that

physicians are deeply concerned about their well-being, rather than treating them like a customer.

A comprehensive strategy for promoting the widespread adoption of telemedicine involves the implementation of diverse initiatives. To expand this scholarship further, researchers should conduct qualitative interviews or focus groups to yield a deeper understanding of specific issues and perspectives of telemedicine adoption related to income loss and trust. Such a qualitative study can expand the stakeholders' comprehension of patient viewpoints, offering valuable context for targeted interventions. Furthermore, researchers should examine the implementation and evaluation of intervention techniques, which are paramount for fostering the acceptance and utilization of telemedicine, focusing on intervention methods that prioritize enhancing trust, minimizing time constraints, and improving CSE. By targeting these crucial elements, interventions can alleviate obstacles and motivate users to embrace telemedicine services.

Finally, the integration of user education initiatives is indispensable. Educational programs can enhance individuals' knowledge and confidence in telemedicine technology, overcoming hurdles from a lack of familiarity or self-assurance. User education enhances users' knowledge and skills, enabling them to utilize telemedicine platforms effectively. This, in turn, fosters a more knowledgeable and empowered user community, promoting increased acceptance and adoption of telemedicine.

Limitations

As is true of many studies, the findings should be interpreted within the context of the sample. The generalizability of these findings may be affected by self-selection bias and the fact that online survey participants are likely to be relatively comfortable with technology and, therefore, more likely to use telemedicine. At the same time, not all patients who could benefit

from telemedicine are necessarily technology-savvy. Likewise, as the sample only included participants from the United States, applying these findings to international groups should be done with caution.

This study did not assess the quality of the telemedicine application user interface or internet access, and how that may affect a patient's intention to use telemedicine. When considering the adoption of telemedicine in communities, infrastructure must be contemplated. The failure of 30% of global telehealth projects has resulted from poor implementation strategies (Khatun et al., 2016). Community needs and readiness are driving factors of telemedicine acceptance. Stakeholders must actively engage communities to understand their beliefs and assess reactions to innovative technology in order to evaluate end-user acceptance of telemedicine services.

Further, decisions regarding medical care are vast in scope, dependent on an enormous number of interrelated factors, some personality characteristics of the patient, some related to the medical condition, some situational, and some related to the medical provider. Designing experiments to understand and ultimately influence patient decisions is substantially complex, and it is unrealistic to expect any experiment to examine the factors that influence such decisions fully. This study incorporated one experience, one demographic, one attitudinal, and two situational, that is, convenience factors. As this is the case, the patient needs to make an appointment at a lab, likely incurring an additional cost. This shortcoming poses a challenge to the adoption of telemedicine for some time. Future studies should develop scenario-based experiments that manipulate medical factors that may influence patient decision-making.

Finally, this study only examined an *intention* to use telemedicine, as distinct from the actual use of telemedicine. Although there is a clear body of research that addresses the high correlation

between intentions and actions (e.g., Riva et al., 2011), and intention to do an action is typically accepted as a proxy for that action (Peña-García et al., 2020), further research is encouraged.

CHAPTER V

CONCLUSION

This research underscored that a patient's choice to utilize telemedicine was significantly shaped by how much disruption their appointment caused in their daily life. Despite serving as a control variable in the study, an individual's confidence in their computer skills emerged as the dominant factor when opting for telemedicine. While age had no significant impact on the decision to use telemedicine, it more likely influenced a patient's comfort level interacting with digital technology for medical appointments. To facilitate telemedicine adoption, local government, health agencies, and community organizations should focus not only on expanding computer and internet access in local communities, but also on equipping individuals with digital literacy skills to boost user confidence, thereby decreasing medical-services disparities.

Telemedicine's utility is positively perceived by participants who are aware of or previously used telehealth. Moreover, this aligns well with the increasing accessibility of mobile phones and the potential cost-effectiveness of telemedicine (Khatun et al., 2016), suggesting telemedicine offers a promising ability to close the healthcare gap. By increasing access to care for those facing geographical or other barriers, telemedicine offers a promising solution to address disparities in healthcare delivery.

Access to healthcare is a universal human need, however, global challenges persist because of inadequate infrastructure, a shortage of skilled professionals, and the high costs associated with specialized care. Patient concerns about access are ubiquitous, regardless of geographic location. Virtual consultations provide patients the opportunity to seek guidance without physical travel, and healthcare practitioners now integrate telemedicine follow-up appointments into chronic illness management. Individuals, including community members and

influential figures, have recognized that rural and remote areas, marked by isolation and limited healthcare access, can benefit from telemedicine as a viable approach for providing healthcare services to the marginalized communities who live there (Khatun et al., 2016).

While telemedicine holds immense potential to improve healthcare delivery, to fully realize its potential for everyone, we must address disparities among underserved communities like Black males, as discussed in the introduction of this study. Lawmakers and planners should prioritize government funding for initiatives that expand access to computers and the internet in these communities. Coupling this with digital literacy training programs may equip underserved individuals with the skills they need to confidently navigate telemedicine platforms.

Following patients' recent exposure to telemedicine services, including online appointments, prompt diagnoses via brief phone calls, and behavioral health consultations, amid the COVID-19 pandemic, the transition of healthcare delivery back to a predominantly in-person framework post-pandemic is anticipated to pose substantial challenges. To effectively deliver virtual care and improve patient trust in physicians, healthcare practitioners must acquire new skills, including building rapport and empathy, conducting physical examinations, diagnosing, and counseling. This necessitates the development of curricula that effectively trains practitioners in these new skills and modalities while ensuring the implementation of quality assurance measures.

Patients who have a high level of trust in their physicians may be more willing to continue using telemedicine to access healthcare services. Trust is a motivating factor for patients to explore alternative modes of healthcare delivery, particularly if recommended or endorsed by their trusted healthcare providers. The positive correlation between exposure to

telemedicine and trust in physicians underscores the importance of building trust and rapport between patients and healthcare providers to increase telemedicine adoption.

Before the introduction of telemedicine, patients seeking non-urgent treatment, regardless of the simplicity or complexity of their needs, had to schedule office appointments with their primary care physicians. Healthcare organizations have the potential to leverage technological advancements to broaden telemedicine applications, customizing them to align with the distinct needs of their respective populations. The primary barrier to replacing an in-person visit with a telemedicine consultation is contingent upon the intensity of care the patient requires. Physicians directing suitable patients to telemedicine services increase exposure and the likelihood of use, particularly if the patient trusts the doctor-patient relationship.

Telemedicine offers a solution to the limitations of pre-pandemic healthcare by allowing for more flexible consultations,expanding and improving access to appropriate care and specialty services, benefiting the broader patient population. Moreover, telemedicine is a cost-effective alternative to in-person medical treatments and should be utilized as supplemental care to alleviate the strain on the medical infrastructure. To fully realize telemedicine's potential, further research is needed to explore optimal integration strategies within existing healthcare delivery models. This will ensure effective utilization as supplemental care while minimizing potential disruptions to patient care workflows.

The core purpose of telemedicine is to enhance individual and community health through disease prevention, treatment provision, and healthcare provider education (Hajesmaeel-Gohari & Bahaadinbeigy, 2021). The acceptance of health IT relies heavily on its utilization and acceptance by medical professionals (Holden & Karsh, 2010). In their review, Vega-Barbas et al. (2014) examined the intersection of confidence and trust in technology acceptance. They noted

that advancements in computing capacity stem from highly technological elements and increased complexity in computing. The prevalence of intelligent computing environments significantly influences telemedicine and personal autonomy.

The field of telemedicine is currently experiencing substantial advancements aimed at reaching a state of technical maturity. Full-scale adoption of an innovation occurs when a substantial portion of its potential consumers actively engage with it. Adopting technology is a multifaceted outcome stemming from a complex decision-making process. Potential interoperability issues between different telemedicine applications are of significant concern to regulators. Clinicians and telemedicine application developers must engage collaboratively for the well-being of the patient community.

The rapid deployment of various telemedicine platforms has allowed for the realization of a long-standing industry goal within a short timeframe. The diversion of clinical treatment from in-person visits to telemedicine is crucial in mitigating the number of patients in more acute healthcare settings. The continued use of virtual services post-pandemic is evidence to support telemedicine's significant contribution to enhancing the medical community's capacity. Significant changes in accessibility and delivery of health services are influenced by the emergence of mobile technology and apps. Cloud computing, for instance, is playing a crucial role in enhancing the use of telemedicine by facilitating the distribution and delivery of healthcare services. Patients can connect promptly with specialists at distant locations through mobile devices, such as laptops, tablets, or mobile phones.

Healthcare innovation is pivotal in balancing costs and the quality of treatment. Despite instances in which healthcare innovation initiatives have yielded positive outcomes, integrating newly discovered healthcare innovations into everyday treatment remains limited (Bird et al.,

2021). Telemedicine applications offer value chains that deliver substantial cost benefits compared to traditional delivery models. As stated previously, when telemedicine usage reaches 10% of all visits, this would signify a growth of at least 1,000% for numerous health systems (Mehlman & Tamburri, 2020). Such exponential growth poses opportunities and challenges for healthcare management. Strategic planning and resource allocation will be necessary in order to fully harness the potential benefits.

A telemedicine system can incur joint expenditures that are difficult to assign, making allocating expenses to a specific service problematic. Additionally, implementing a telemedicine system may result in extended signals for its use, further complicating the evaluation process. Lastly, the rapid pace of technical advancements can render current technology obsolete, necessitating ongoing assessments to maintain relevance. The prospective expansion of telemedicine services hinges on two critical factors: the benefits it offers patients and the overall financial implications for healthcare providers. Specifically, the expected outweighing of costs by the benefits for patients becomes more pronounced, particularly when providers face a relatively low opportunity cost associated with delivering telemedicine services.

Telemedicine is a valuable tool that practitioners should consider employing to effectively decrease patient burdens in care facilities. As the utilization of telemedicine by patients continues to rise, it becomes imperative for physicians to spend time specifically facilitating and providing support for telemedicine services. Several obstacles continue to impede the widespread acceptance of telemedicine, including restricted payment and, particularly outside of rural healthcare settings, a shortage of compelling justifications for replacing traditional in-person treatment (Bird, 2021). The adoption of telemedicine services is contingent upon numerous variables. Several factors, often overlooked in established theories elucidating

technology acceptability, revolve around the environment in which they unfold. These elements encompass the alignment between the service configuration and individuals' daily routines, their intrinsic motivation, and the psychological impact induced by the technology.

Telemedicine can diminish the stress on families and on the medical system that will emerge in the coming decades. Lawmakers have expanded access to telemedicine services, with 57.4% of Medicare Advantage plans now offering telemedicine benefits (Park et al., 2021). The increased acceptance of telemedicine by CMS is to likely influence other public health insurers to provide telemedicine coverage. Failure to make critical decisions by lawmakers may result in substantial financial societal impacts affecting medical pricing structures for decades, underscoring the need for continued research.

Telemedicine is a practical solution for reducing health disparities and enhancing patient medical outcomes by providing access to appropriate treatment and specialized services for the general patient population. The expansion of telemedicine is propelled by crucial factors such as an aging population, an increased incidence of chronic illnesses, and the demand for specialists to be accessible across diverse locations simultaneously (Brown, 2008). Technological advancements like telemedicine are expanding access to healthcare professionals, alleviating the strain on the traditional healthcare system. This approach offers a valuable supplement to in-person care, benefiting not only patients but also the industry itself. Lawmakers, social workers, community activists, and family caregivers who support loved ones daily will all find the results of this study insightful, as telemedicine has the potential to ease their burdens as well.

The global health crisis spurred an unprecedented reliance on remote work solutions and accelerated the enhancement of telehealth infrastructure to meet future demand for virtual healthcare services. Futurists have long predicted the ascent of remote healthcare services

delivered through various telecommunications devices (Custer, 2020). This paradigm shift has cultivated a widespread acclimatization to digital technology across all age groups. Family members across generations have seamlessly integrated digital tools into their daily lives, whether for receiving news updates via connected devices, engaging in video chats for various purposes, or managing financial transactions online. This societal adaptation not only underscores the resilience of communities but also signifies a lasting transformation in how people connect, communicate, and access essential services.

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APPENDICES

Appendix A

Ethical Considerations

Before data collection for this project, permission was obtained from the institutional review board of Prairie View A&M University (IRB). The danger from participating in this study was relatively low. Informed consent was obtained from each participant before the participant filled out the questionnaire. The data obtained through MTurk do not include personal identifiable information (PII) or personal health information (PHI); this study did not include any interaction with human individuals. To guarantee that people's privacy was maintained, the research did not contain any personal data or information. MTurk has its own, internal identification number for each participant that is seen by the researcher, but that number is not linked to any public information, and it is reasonable to believe that Amazon would not release such internal documentation without a court order.

After the research's conclusions are published, all data gathered for the analysis will be used and kept for no longer than five years before being permanently deleted. All physical copies were shredded. Because data were gathered online, the researcher had no direct contact with study participants, limiting the possibility of subject-interaction-related bias. The survey questionnaire was modified from earlier studies to assure validity and reliability and to keep the researcher's preconceptions about possible results to a minimum.

Participant Informed Consent Form

PRAIRIE VIEW A&M UNIVERSITY
OFFICE OF RESEARCH COMPLIANCE
INFORMATION SHEET

TITLE OF STUDY: Identifying barriers to the use of telemedicine

PROTOCOL NUMBER: **2023-028**

DEAR STUDY PARTICIPANT:

You are invited to participate in a research study of what sort of people use telemedicine (telemedicine lets your health care provider care for you without an in-person office visit. Telehealth is done primarily online with internet access on your computer, tablet, or smartphone).

You were selected as a possible participant because you are a 'worker' on MTurk, and as such are an adult.

I ask that you read this form and ask any questions you may have before agreeing to be in the study.

This study is being conducted by: Robert Zinko of the Management and Marketing Department of Prairie View A&M University

The purpose of this study is to attempt to defind the characteristics that would have a person using telemedicine.

If you agree to participate in this study, we will ask you to do the following things:

Answer a 51 item questionnaire that askes you about your use and knowledge of telemedicine, as well as general demographics information. You will NOT be asked any sort of personal, medical information (aside from general questions like if you use telemedicine, how close are you to your doctor's office, or your level of trust in the medical system).

Risks and Benefits of participating in the Study

The only risk is that you will be asked if you trust your doctor. To do this, you may have to recall past experiences with medical personal.

The benefit to participation is that you may learn a bit about telemedicine, if you are not already familiar with it.

Compensation:

THIS PROJECT HAS BEEN REVIEWED BY THE
PRAIRIE VIEW A&M UNIVERSITY INSTITUTIONAL REVIEW BOARD
FOR THE PROTECTION OF HUMAN SUBJECTS.
Phone: (936) 261-1553, Office of Research & Innovation

You will receive payment: ten cents, to be retransferred to your MTurk account, upon verification of completion of the survey.

Confidentiality:

The records of this study will be kept private. In all reports resulting from this study, we will not include any information that will make it possible to identify you as a participant. Research records will be stored securely and only researchers will have access to the records.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Prairie View A&M University. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

Contacts and Questions:
The researcher conducting this study is Robert Zinko.

You may ask any questions you have now by contacting him, before you begin the study at razinko@pvamu.edu, or (966) 261-9218, or office 358, Agg and Bus building, Prairie View A&M University, 100 University Dr, Prairie View, TX 77446.

If you have questions later, **you are encouraged** to contact him at the same address.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), **you are encouraged** to contact the Office of Research Compliance at researchcompliance@pvamu.edu or 936-261-1553 (Fax 936-261-3528).

Statement of Consent:

If you agree that you have read the above information, asked and questions you may have, received answers, and consent to participate in the study, please click the below button. If you do not, please close your browser window at this time.

Appendix B

Qualtrics Telemedicine Survey

Start of Block: Default Question Block

Q1 How familiar are you with telemedicine (telemedicine allows your healthcare provider to care for you without an in-person office visit. Telemedicine is primarily done online with internet access on your computer, tablet, or smartphone)?

- ○ Very familiar (9)
- ○ Familiar (10)
- ○ Somewhat familiar (11)
- ○ Neither familiar nor not familiar (12)
- ○ Somewhat not familiar (13)
- ○ Not familiar (14)
- ○ Very not familiar (15)

Q2 Have you ever used telemedicine?

- ○ Yes (1)
- ○ No (2)

Skip To: Q6 If Have you ever used telemedicine? = No

Q3 If yes, how much do you agree with the following statement?
My experience with telemedicine has been positive.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q6 Does your doctor offer telemedicine?

- ○ Yes (1)
- ○ No (2)
- ○ Unsure (3)

Q7 Do you have medical insurance?

- ○ Yes (1)
- ○ No (2)

Skip To: Q10 If Do you have medical insurance? = No

Q8 If yes, how much do you agree with the following statement?
My medical insurance is good.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q9 Does your insurance cover telemedicine?

- ○ Yes (1)
- ○ No (2)
- ○ Unsure (3)

Q10 If you live with family members, do they have medical insurance?

- ○ Yes (1)
- ○ No (2)
- ○ Some of them (3)

Q11 How much do you agree with the following statement?
I would use telemedicine if it was cheaper than an in-person visit.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q12 On average, how often do you go to the doctor each year?

	0 9 18 27 36 45 55 64 73 82 91 100
Number of doctor visits ()	

Q13 How much do you agree with the following statement?
I trust the medical community.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q15 How often do you use a computer, tablet, or smartphone?

- ○ Never (1)
- ○ Rarely (2)
- ○ Occasionally (3)
- ○ Sometimes (4)
- ○ Frequently (5)
- ○ Usually (6)
- ○ Often (7)

Q16 How much would you agree with the following statement?
I am comfortable with computer usage.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q19 How much would you agree with the following statement?
I am willing to use telemedicine.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q21 How much would you agree with the following statement?
I trust the security of telemedicine.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q22 How much would you agree with the following statement?
I would be willing to learn about telemedicine.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q23 Do you have a debit or credit card?

- ○ Yes (1)
- ○ No (2)

Q26 Do you lose income when you attend medical visits (such as having to take the day off from work, and not being paid for that day)?

- ○ Yes (1)
- ○ No (2)

Q27 Are you concerned about losing income attending medical appointments?

- ○ Yes (1)
- ○ No (2)

Skip To: Q29 If Are you concerned about losing income attending medical appointments? = No

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Q28 If yes, does the concern for lost income prevent you from attending medical appointments?

- ○ Yes (1)
- ○ No (2)

Q29 Are you concerned about losing income when you attend family medical appointments?

- ○ Yes (1)
- ○ No (2)

Skip To: Q32 If Are you concerned about losing income when you attend family medical appointments? = No

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Q30 If yes, does the concern for lost income prevent you from attending medical appointments?

- ○ Yes (1)
- ○ No (2)

Q32 How much do you agree with the following statement?
Doctors in [general] care about their patients' health just as much as or more than their patients do.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q33 How much do you agree with the following statement?
Doctors are extremely thorough and careful.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q34 How much do you agree with the following statement?
I completely trust doctors' decisions about which medical treatments are best.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q35 How much do you agree with the following statement?
Doctors are totally honest in telling their patients about all of the different treatment options available for their conditions.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q36 How much do you agree with the following statement?
Doctors think only about what is best for their patients.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q37 How much do you agree with the following statement?
Doctors always use their very best skill and effort on behalf of their patients.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q38 What is your main form of transportation?

- ○ Personal vehicle (1)
- ○ Public transportation (2)
- ○ Ride with friend (3)
- ○ Ride service (Uber or taxi) (4)
- ○ Walk or bicycle (5)

Q39 Do you own your own home?

- ○ Yes (1)
- ○ No (2)

Q40 What is your gender?

- ○ Male (1)
- ○ Female (2)
- ○ Nonbinary/third gender (3)
- ○ Prefer not to say (4)

Q41 What sort of area do you live in?

- ○ Rural (1)
- ○ Urban (city) (2)

Q42 What is your race?

- ○ White (Non-Hispanic) (1)
- ○ Black or African American (2)
- ○ American Indian or Alaska Native (3)
- ○ Asian (4)
- ○ Native Hawaiian or Pacific Islander (5)
- ○ Hispanic (6)
- ○ Other (7)

Q43 What is your marital status?

- ○ Married (1)
- ○ Widowed (2)
- ○ Divorced (3)
- ○ Separated (4)
- ○ Never married (5)

Q44 What is your highest level of education?

- ○ Less than high school degree (1)
- ○ High school degree or equivalent (e.g., GED) (2)
- ○ Some college or AA degree (3)
- ○ College degree (4)
- ○ Graduate degree (5)

Q45 Which of the following categories best describes your employment status?

- ○ Employed, Part-Time (1)
- ○ Employed, Full Time (2)
- ○ Not employed, looking for work (3)
- ○ Not employed, NOT looking for work (4)
- ○ Retired (5)
- ○ Disabled, not able to work (6)

Q46 How much total combined income did all members of your household earn in 2022?

- ○ Under $20,000 (1)
- ○ $20,000–$39,999 (2)
- ○ $40,000–$59,999 (3)
- ○ $60,000–$79,999 (4)
- ○ $80,000–$99,999 (5)
- ○ $100,000–$119,999 (6)
- ○ $120,000–$139,999 (7)
- ○ $140,000 or more (8)

Q47 What is your age?

0 10 20 30 40 50 60 70 80 90 100

Click to write Choice 1 ()

Q49 Including yourself, how many individuals aged 18 or older live in your household?

0 2 4 6 8 10 12 14 16 18 20

Click to write Choice 1 ()

Q50 How many individuals aged 17 or younger live in your household?

0 2 4 6 8 10 12 14 16 18 20

Click to write Choice 1 ()

Q52 Do you earn an annual salary or are you paid hourly?

- Salary (1)
- Hourly (2)
- Unemployed (3)

Q57 How much would you agree with the following statement?
Travel time affects my decision to attend medical appointments.

- ○ Strongly agree (28)
- ○ Agree (29)
- ○ Somewhat agree (30)
- ○ Neither agree nor disagree (31)
- ○ Somewhat disagree (32)
- ○ Disagree (33)
- ○ Strongly disagree (34)

End of Block: Default Question Block

Start of Block: Block 1

Q58 Thank you for completing the survey! Please input code 69 in MTurk!

End of Block: Block 1

This survey was adapted from the below reference:

Hall, M. A., Dugan, E., Zheng, B., & Mishra, A. K. (2001). Trust in physicians and medical institutions: What is it, can it be measured, and does it matter? *The Milbank Quarterly*, *79*(4), 613–639.

CURRICULUM VITA

Carleton Brown
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EDUCATION

- B.S, University of Houston – Clear Lake, 2002
- MBA, Northeastern University, 2010
- MA, Naval War College, 2013
- MS, The George Washington University, 2017

WORK EXPERIENCE

- Company: General Electric Aerospace
  Position: Senior Contract Performance Manager
  Job: Manage Subcontractors

- Company: Humana
  Position: IT Procurement Lead
  Job: Manage the Procurement of Server Equipment

- Company: General Electric Power
  Position: Senior Contract Manager
  Job: Negotiate and Manage Contracts

PROFESSIONAL, TECHNICAL AND WORK-RELATED EXPERIENCE AND SKILLS

- Six Sigma certificates as both a Green and Black Belt
- Certified Professional Contract Manager (CPCM)

PUBLICATIONS AND PRESENTATIONS

Brown, C. T., Zinko, R., Ngamassi, L., Ndembe, E., & Furner, C. (2024). Barriers to intention to adopt telemedicine: The interplay between exposure, trust, and convenience. *Health Marketing Quarterly*, 1-23.

Brown, C., Njouondo, E., Viltz, D., & Bell, R. (2023). Effective Leaders Are Trained—Not Born!. *Journal of Management Policy and Practice*, *24*(1), 32-40.