UTILIZATION OF TELEMEDICINE BY PEOPLE WITH CHRONIC HEALTH CONDITIONS DURING THE COVID-19 PANDEMIC

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This study sought to better understand the experiences of individuals with a chronic health condition utilizing telemedicine during the first twelve months of the COVID-19 pandemic. To do this, an online survey was advertised in two private Facebook support groups for individuals with adrenal insufficiency; a chronic health condition that requires frequent communication with healthcare providers. The survey consisted primarily of closed-response questions which examined the demographic data of respondents, their access to healthcare providers, their comfort levels accessing healthcare providers, and the number of times individuals sought healthcare during the first twelve months of the COVID-19 pandemic to try and predict their preference for telemedicine and in-person healthcare visits going forward. Additionally, the survey included open-response questions which allowed for respondents to describe their experience utilizing telemedicine during the first twelve months of the COVID-19 pandemic. Most respondents described their use of telemedicine as being positive but have indicated there are some health circumstances in which telemedicine may not be the best option for them. Additionally, findings indicate that individual's comfort level in visiting their healthcare providers in-person during that first year of the COVID-19 pandemic is a significant predictor of an individual's preference for telehealth. This gives future studies a starting point to investigate the driving social and health factors that shape an individual's perception of risk influencing their level of comfort and predicting their preference of telemedicine or in-person visits for their non-emergency healthcare needs.

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CHAPTER 1

INTRODUCTION

1.1 Overview

In 2007, disaster researcher and political scientist Patrick Lagadec recognized that disaster events are accelerating in complexity, frequency, and intensity. Specifically, disasters are becoming more “global” in scale, “intertwined” (i.e., cascading) and “non-textbook” in nature (Lagadec, 2007, p. 489). Dr. Lagadec was especially focused on the threat of a globally dispersed virus when he warned that in our global society, viruses can rapidly spread geographically as hosts can carry and spread a virus as they move through international hubs their way to their destinations; obscuring the viruses point of origin. By the time a virus threat is recognized, it can be too late for governments to deploy any effective first line of defense against its spread (i.e., screening, travel restrictions, etc.). He alluded that the next line of defense is our healthcare systems, but due to increased shared use of specialized staff across interconnected networks of hospital systems, this line of defense can work against itself before the threat is recognized. Unfortunately, Dr. Lagadec’s warnings were substantiated with the global spread of the SARS-CoV-2 (COVID-19) virus 12 years later.

1.2 COVID-19 Discovery and Early Actions

COVID-19 was first identified in Wuhan, China in December 2019; symptoms range from being asymptomatic (infected without symptoms) to mild and severe illness that can lead to death. Those who have underlying medical conditions and the elderly are statistically more vulnerable to experiencing severe illness and death (CDC, 2020). COVID-19 is transmitted from human to human through respiratory droplets, close contact with those infected and potentially through fecal-oral and aerosol contact (Dos Santos, 2020).

In December 2019, Chinese health officials issued an epidemiological alert to the Chinese Centers for Disease and Prevention and the World Health Organization (WHO) after a cluster of pneumonia cases were linked to a live animal market in Wuhan, China. At the beginning of January 2020, scientists discovered a new coronavirus named SARS-CoV-2 or COVID-19 and determined that it was responsible for the cluster of pneumonia cases in Wuhan (Boni et al., 2020). By mid-January governments around the world began implementing mitigation procedures aimed at preventing the further spread of the virus. International travel restrictions and bans were put in place and quarantine stations were established to identify positive cases of COVID-19 before the virus could be further spread to the general public (Patel and Jernigan, 2020).

1.3 COVID-19 in the United States

Despite these efforts, the first positive COVID-19 case in the United States was recorded on January 21, 2020; a traveler who had been exposed to the virus while in Wuhan, China. By February 4, the number of positive cases in the U.S. increased to 11 and an additional 293 people from 36 states were being investigated as potentially positive cases (Patel and Jernigan, 2020). However, many positive cases in the United States went largely undetected in the general population in the first weeks of the pandemic due to (1) a lack of testing; (2) the timing of the distribution of the virus during the annual influenza season; and (3) many positive cases are asymptomatic (i.e., not having any signs of illness) (Schuchat, 2020).

On March 11, 2020, the World Health Organization officially declared COVID-19 a global pandemic. With 57 dead Americans and 911 new positive cases former President Trump declared the pandemic a national emergency on March 13, 2020; making $50 billion in federal funds available for states and territories to combat and mitigate the spread of the virus (Dos Santos, 2020; Taylor, 2020; *National data: Deaths,* 2020; United States et al., 2020).

Americans were asked to stay home, wear face coverings, only travel when absolutely necessary, and avoid large gatherings to slow the spread. In many states, only individuals with occupations that were considered essential were permitted to continue working in person, but with new safety guidelines in place. Despite slowing the spread efforts, the number of infected and deceased continued to climb, putting a heavy strain on healthcare system resources. As a result, on March 18, 2020, the Centers for Medicare and Medicaid Services announced that all elective surgeries, and all non-essential medical, surgical, and dental procedures must be suspended to decrease the possibility of disease transmission and to conserve much needed personal protective equipment (Diaz et al., 2020).

1.4 COVID-19 Anniversary

March 13, 2021 marked the first anniversary of the COVID-19 contagion national emergency. During this first year, COVID-19 claimed the lives of 535,071 individuals living in the United States (Ritchie et al., 2021). On the day of the anniversary, 1,850 individuals passed away from COVID-19 and an additional 52,857 new cases of COVID-19 in the U.S. where recorded. Nearly 5,000 of those new cases required hospitalization; a trend expected to continue until herd immunity can be achieved. As of the anniversary, only 11.3% of the United States population had been fully vaccinated, with an additional 21% of the population partially vaccinated (Ritchie et al., 2021).

COVID-19 severely stretched the limits of healthcare in the U.S. and many adaptions to business practices rapidly emerged and implemented in response to the on-going pandemic. Specifically, healthcare systems were encouraged to move away from traditional methods of healthcare delivery and adopting or expanding their telemedicine capabilities; a move that is expected to redefine the future of healthcare delivery (Brown et al., 2020; Mann et al., 2020; Nouri et al., 2020). Using a quantitative online survey, this study seeks to better understand how telemedicine has been utilized to provide continuity of healthcare for people with chronic health conditions during the first twelve months of the COVID-19 pandemic and attempt to predict which method of non-emergency healthcare delivery they prefer going forward. Specifically, this study examines accessibility of telemedicine, ease of use, and quality of care from the patient's perspective during the first twelve months of the COVID-19 pandemic, all of which is underrepresented in post pandemic literature.

CHAPTER 2

LITERATURE REVIEW

2.1 Telemedicine

Telemedicine is synonymous with telehealth; an umbrella term that describes any delivery of healthcare services across distances through the utilization of telecommunications (e.g., phone, or web-based video communication) (Wootton, 2001; Craig, 2005; Wootton, 2017; OCR, 2020). There is a wide body of knowledge on telemedicine in general, and there are dozens of articles about the utilization of telemedicine for people with chronic health conditions that were published prior to the COVID-19 pandemic. In 2020, an assessment of telemedicine literature that was published in 2018 or prior identified that out of 2,318 articles on telehealth, only 39 articles were empirical studies focused on web-based remote video conferencing between patients with chronic health conditions and healthcare professionals (Almathami et al., 2020). Over 90% of the articles reported an increase in overall health conditions for patients who participated in online health consultations with their healthcare providers. Approximately 26% of the articles reported high patient satisfaction with telehealth consultations and telehealth consultations were just as good as in-person healthcare visits in meeting their healthcare needs. Technological barriers were identified in twenty of the articles with fifteen of those reporting that slow internet speeds resulted in poor visual and audio quality and led to poorer communication between patients and healthcare providers. The other five articles reported higher satisfaction of communication quality because patients had access to fast and reliable internet connections. Training of clinicians to familiarize them with using the telehealth system and equipment were only reported in ten of the articles, but twenty articles reported clinicians providing training for patients. Cost savings were reported in twenty-one of the articles; eight of those articles evaluated the cost difference between in-person and online consultations and only one factored in the price per mile a patient had to travel for in-person consultations (Almathami et al., 2020).

Prior to the outbreak of COVID-19, three out of four healthcare systems had telemedicine capabilities, but physicians often described its utilization as being too complex, too disruptive, and too expensive (American Hospital Association, 2019; Smith, 2020). COVID-19 restrictions made it necessary to utilize telemedicine and provide funds to enhance its use; as a result, healthcare providers are experiencing the benefits of telemedicine for their clinics, leaving their preconceptions behind (Smith, 2020). Telemedicine has proved to be key for disseminating COVID-19 treatments and maintaining routine healthcare visits for the general public; in places like New York City where the use of telemedicine increased six-fold and accounted for 70% of all nonemergency medical visits (Barbash et. al., 2021; Mann et. al., 2021; Stone, 2021).

By March 2020, telehealth insurance claims were approximately 57 times greater than telehealth claims from March 2019 (*Monthly telehealth regional tracker,* (n.d.)). The U.S. Department of Health and Human Services (HHS) encouraged the expansion of telehealth services by allowing for greater flexibility to the Health Insurance Portability and Accountability Act of 1996 (HIPAA); allowing HIPAA covered healthcare providers to facilitate telehealth visits through communication applications (e.g., Zoom, Skype, FaceTime, Facebook Messenger, etc.) that were already common and widely familiar to the general public (HHS, 2021).

The Centers for Medicare and Medicaid Services encouraged the expansion of telehealth services during the COVID-19 pandemic by issuing temporary changes that allowed healthcare providers to bill for telehealth services as if appointments had taken place in person and allowed for Medicare and Medicaid recipients to receive telehealth services from out of state providers (HHS, 2021).

2.2 Benefits of Telemedicine

Telemedicine can provide easier access to healthcare for individuals with mobility limitations, chronic illness, coronaphobia (i.e., excessive fear of contracting COVID-19 triggered by the idea of leaving their home or meeting new people), or for any number of other reasons (Arora et al., 2020). The patients expected to benefit the most from telemedicine during the COVID-19 pandemic are socially vulnerable individuals with chronic health conditions that put them at higher-risk for having complications if infected with COVID-19 (Liu et al., 2020). Chronic conditions that make individuals experience a higher risk to hospitalization if infected with COVID-19 are those with diabetes, cardiovascular disease, kidney disease, individuals who are obese, and individuals with a compromised immune system (Nouri et al., 2020). Individuals with one or more of these chronic health conditions were asked to self-isolate for their own safety. Yet for many, continuous medical care is required to maintain their health and quality of life (Liu et al., 2020). Telemedicine also provides an opportunity for those who live with someone with a chronic health condition to seek medical consultation or refill a prescription without having to experience the anxiety and fear that they may endanger a loved one. Past research has shown that individuals with chronic health conditions that utilize telehealth interventions experience a significant reduction in hospital visits. This is largely due to ability of healthcare professionals to identify negative health symptoms in patients sooner and quickly modifying the patient's care before a hospital visit becomes necessary (De Toledo, et. al., 2006; Silva-Cardoso et al., 2021).

Telemedicine shown to reduce the need of transferring patients from rural hospitals to urban hospitals, saving upwards of $5,500 per patient in avoided transfer costs (Natafgi et al., 2018). Reductions in hospital visits reduce the monetary burden on the individual and the healthcare industry; telemedicine has the ability to lower healthcare costs by an average of $4,000 per emergency visit in rural areas (Kruse, et. al., 2017; Natafgi et al., 2018).

2.3 Challenges of Telemedicine

Telemedicine has proven to be useful and even necessary during the COVID-19 pandemic, but it's explosion in growth has exacerbated many issues that need addressing if its use is to remain a viable solution for healthcare delivery. Of these issues, technological barriers that prevent patients from utilizing telemedicine, state licensing requirements that are restrictive, and health insurance claims are among the greatest challenges (Weinstein et al., 2014; Tuckson et al., 2017; Triana et al., 2020).

The individuals who are less likely to utilize and/or benefit from telemedicine are those with technological barriers that prevent them from remotely communicating with healthcare providers. Individuals with technological barriers are often living in rural areas, living under the poverty level, a person of color, over the age of 65, or have a limited English-speaking ability (Nouri et al., 2020). To reduce disparities in accessing telemedicine healthcare administrators should consider developing telemedicine strategies that encourage risk-reduction for socially vulnerable patients. Socially vulnerable patients can be identified through effective pre-screening procedures and staff can connect patients with resource opportunities (Nouri et al., 2020). Healthcare providers can also help mitigate technological barriers by providing all new telemedicine patients an optional introductory training session to familiarize new patients with the application and to identify and find solutions for any technological issues prior to the initial visit with a physician. For those who lack access to the technology needed, healthcare providers can assist in helping in-need patients find programs such as the Federal Lifeline Assistance program; a government program that provides low-income individuals with a free smartphone and low-cost monthly data plan (FCC, 2021).

The HHS has allowed for greater flexibility during the pandemic to expand telemedicine services by allowing medical providers to utilize common communication applications that already being widely used for other purposes (HHS, 2020). Currently, delivery of telemedicine often crosses state lines and therefore, licensing requirements and the cost related with licensing is often complicated and expensive (Weinstein et al., 2014; Tuckson et al., 2017). Attempts to address this issue date back to April of 2013 when the Federation of State Medical Boards designed and championed the Interstate Medical Licensure Compact. As of March of 2021, only 28 states and territories have signed the compact into Law (FSMB; 2021; Tuckson et al., 2017). This affects liability claims as insurance laws vary between states, and the insurance company assumes the responsibility for deciding which state to process a liability claim; this can create an outcome where one party benefits over the other. For example, an insurance provider may choose to process the claim in whichever state (the patient's or the healthcare provider's) that favors the insurance company the most (Tuckson et al., 2017).

2.4 COVID-19 and Telemedicine

The current body of literature on the utilization of telemedicine for providing continuity of healthcare during the COVID-19 pandemic is still limited given the pandemic is still active and research takes time. In the early weeks of the pandemic as telemedicine was being implemented, in-person healthcare consultations decreased significantly (Mann et al., 2020). For people of color, the implementation of telemedicine limited access to healthcare and experienced a decrease in healthcare consultations with their providers, yet non-Hispanic whites experienced an increase of access to healthcare providers and reported having more healthcare consultations than pre-pandemic. Healthcare consultations also decreased for individuals over the age of 65, individuals who have limited English speaking abilities, and those who are on Medicare and Medicaid (Nouri et al., 2020). These are all known issues that appear in telemedicine literature published prior to the pandemic, but with the sudden expansion in the utilization of telemedicine there is a need to understand how these issues were exaggerated for individuals with chronic health conditions that increase their risk of morbidity to COVID-19. This research aims to fill this gap in the literature and offers an important first step in to understanding how patients with chronic health conditions experienced and accessed telemedicine to identify their level of comfort with using telemedicine for the remainder of the COVID-19 pandemic and beyond. Specifically, this study asks seven research questions (RQ) with accompanying variable and hypotheses (h_x) for each question:

2.5 Research Questions and Coding

2.5.1 Research Question 1

To what extent does annual household income and age predict an individual's preferred method of non-emergency healthcare delivery (i.e., telehealth or in-person)?

- Variables:

- Y = Preferred healthcare delivery (0 = In-person visit, 1 = Telehealth visit)
- X_1 = Age (1 = 18-24, 2 = 25-34, 3 = 35-44, 4 = 45-54, 5 = 55-64, 6 = 64-75, 7 = 75-84, 8 = 85+)
- X_2 = Annual household income measured in dollars (1 = $0-$19,999, 2 = $20,000-$39,999, 3 = $40,000-$59,000, 4 = $60,000-$79,999, 5 = $80,000-$99,999, 6 = $100,000+)

Independent variables in this model are treated as continuous variables (Robitzsch, 2020).

- Hypotheses:
  - h_0: Age and annual household income are not statistically significant predictors of an individual's preferred method of non-emergency healthcare delivery.
  - h_1: Age and annual household income are statistically significant predictors of an individual's preferred method of non-emergency healthcare delivery.

2.5.2 Research Question 2

To what extent does living in a rural geographic location, the miles an individual must travel round-trip to visit with primary healthcare providers and specialist predict an individual's preferred method of non-emergency healthcare delivery (i.e., telehealth or in-person)?

- Variables:
  - Y = Preferred healthcare delivery (0 = In-person visit, 1 = Telehealth visit)
  - X_1 = Rural Geographic Location (0 = Other, 1 = Rural)
  - X_2 = Round-trip miles to visit with primary healthcare providers
  - X_3 = Round-trip miles to visit with specialists
- Hypotheses:
  - h_0: Living in a rural geographic location and the miles an individual must travel round-trip to visit with primary and specialist healthcare providers are not statistically significant predictors of an individual's preferred method of non-emergency healthcare delivery.

- h_1: Living in a rural geographic location and the miles an individual must travel round-trip to visit with primary and specialist healthcare providers are statistically significant predictors of an individual's preferred method of non-emergency healthcare delivery.

2.5.3 Research Question 3

Is there a significant difference in the average round-trip miles driven to visit with primary care providers between those who prefer in-person and those who telehealth healthcare visits?

- Variables:
  - Y = Round-trip miles to visit primary care provider
  - X_1 = Preferred method of healthcare delivery split into two groups (I = In-person, T = Telehealth
- Hypotheses:
  - h_0: There is not a significant difference in the average round-trip miles driven between those who preferred in-person visits and those who prefer telehealth visits with healthcare providers.
  - h_1: There is a significant difference in the average round-trip miles driven between those who preferred in-person visits and those who prefer telehealth visits with healthcare providers.

2.5.4 Research Question 4

Does preferred healthcare delivery vary by living in a rural geographic location?

- Variables:
  - X_1 = Preferred healthcare delivery (0 = In-person visits, 1 = Telehealth visits).
  - X_2 = Rural geographic location (0 = Other; 1 = Rural)
- Hypotheses:
  - h_0: Preferred healthcare delivery does not vary by living in a rural geographic location.

- h_1: Preferred healthcare delivery does vary by living in a rural geographic location.

2.5.5 Research Question 5

To what extent does access to reliable internet connect and an individual's need of assistance (e.g., transportation assistance, A.S.L. interpreter, mobility assistance, etc...) to access healthcare professionals in-person predict an individual's preferred method of non-emergency healthcare delivery (i.e., telehealth or in-person)?

- Variables:
  - Y = Preferred healthcare delivery (0 = In-person visits, 1 = Telehealth visits).
  - X_1 = Access to reliable internet connection (0 = Does not have reliable internet connection, 1 = Has reliable internet connection).
  - X_2 = Need of assistance to access in-person healthcare (0 = Does not require assistance, 1 = Requires Assistance)
- Hypotheses:
  - h_0: Access to a reliable internet connection and individual's need of assistance to access in-person healthcare are not statistically significant predictors of an individual's preferred method of non-emergency healthcare delivery.
  - h_1: Access to a reliable internet connection and individual's need of assistance to access in-person healthcare are statistically significant predictors of an individual's preferred method of non-emergency healthcare delivery.

2.5.6 Research Question 6

To what extent does an individual's level of comfort navigating new and unfamiliar webpages and web-based applications necessary for using telemedicine, and their comfort level in visiting with healthcare providers in-person during the first twelve months of the COVID-19 pandemic predict an individual's preferred method of non-emergency healthcare delivery (i.e., telehealth or in-person)?

- Variables:
  - Y = Preferred healthcare delivery (0 = In-person visit, 1 = Telehealth visit).
  - X_1 = Comfort level navigating new and unfamiliar webpages and web-based applications (0 = Extremely uncomfortable, 1 = Somewhat uncomfortable, 2 = Neither comfortable nor uncomfortable, 3 = Somewhat comfortable, 4 = Extremely comfortable).
  - X_2 = Comfort level in visiting with healthcare providers in-person during the first twelve months of the pandemic (0 = Extremely uncomfortable, 1 = Somewhat uncomfortable, 2 = Neither comfortable nor uncomfortable, 3 = Somewhat comfortable, 4 = Extremely comfortable).
- Hypotheses:
  - h_0: An individual's comfort level in navigating new and unfamiliar webpages and web-based applications necessary for the utilization of telemedicine, and an individual's level of comfort in visiting with healthcare providers in-person during the first twelve months of the COVID-19 pandemic are not statistically significant predictors of an individual's preferred method of non-emergency healthcare delivery.
  - h_1: An individual's comfort level in navigating new and unfamiliar webpages and web-based applications necessary for the utilization of telemedicine, and an individual's level of comfort in visiting with healthcare providers in-person during the first twelve months of the COVID-19 pandemic are statistically significant predictors of an individual's preferred method of non-emergency healthcare delivery.

2.5.7 Research Question 7

To what extent does the number of times an individual has utilized telemedicine during the first twelve months of the COVID-19 pandemic predict an individual's preferred method of non-emergency healthcare delivery (i.e., telehealth or in-person)?

- Variables:

- Y = Preferred healthcare delivery (0 = In-person visit, 1 = Telehealth visit)
- X_1 = The number of times an individual utilized telemedicine during the first twelve months of the COVID-19 pandemic

- Hypotheses:
    - h_0: The number of times an individual has utilized telemedicine in the first twelve months of the COVID-19 pandemic is not statistically significant predictors of an individual's preferred method of non-emergency healthcare delivery.
    - h_1: The number of times an individual has utilized telemedicine in the first twelve months of the COVID-19 pandemic is statistically significant predictors of an individual's preferred method of non-emergency healthcare delivery.

CHAPTER 3

METHODS

3.1 Participant Source

To understand patients' experiences with telemedicine during the first twelve months of the COVID-19 pandemic, an online survey in Qualtrics was developed and advertised in two Facebook support groups for individuals with chronic health conditions: Women's Adrenal Insufficiency Public Support Group (hereafter "Group A") and Cortisol Pump Public Group (hereafter "Group B"). Attempts were made to expand the survey into other Facebook support groups for individuals with chronic health conditions to diversify the study population. Administrators of these groups declined to allow for the advertising of the survey in their groups to protect their members. Both participating Facebook support groups had a combined total of 6,686 members at the time the survey was published. Of these members, 5,088 met the residency requirements for living in the United States during the first twelve months of the pandemic while experiencing a chronic health condition. The two support groups are comprised of steroid dependent individuals with adrenal insufficiency. Due to their increased risk of steroid under or over replacement, members of both groups often have regular communication with their primary care physicians and specialists as they have compromised immune systems.

3.2 Participant Recruitment and Survey Completion Rate

The survey was published and advertised in both Facebook groups on September, 17 2021 and was concluded on January, 31 2022; a total of 136 days. To keep the advertisement posts towards the top of the support group pages, and thus increase visibility of the study, the posts were bumped (i.e., comment on the post) every other day. Active members of both groups had a total of 1,111 posts, 16,403 comments and 22,118 reactions during the survey period (numbers adjusted to exclude researcher engagement); making the advertisement of the survey less visible. Unfortunately, both groups experienced a reduction of 30-40% in member engagement when compared to the 136 days prior to the publication of the survey.

During the time of the survey, only 2,193 members had visited Group A and 738 members visited Group B. Group A had a U.S. resident percentage of 76% (1,667 members) and Group B had 74% (546 members); reducing the number of potential survey participants to approximately 2,213. Both groups consisted primary of females, Group A at 99% female (Figure 3.1) and Group B being 91% female (Figure 3.2). Given that males would be underrepresented, it was decided to remove males from the study entirely. Removing males from the study population reduced Group A to a total of 2,172 and Group B to 497 for a combined total of 2,669 potential respondents.

Membership in both Group A and B often overlaps, a sample size of 78 of the most contributing members of Group B were searched by name in the member search bar of Group A; 37 members or 47.43% of Group B members also belonged to Group A. Given this overlap, conservatively, this gave an approximate total of 1,030 qualifying members as eligible participants for the study. It is impossible to determine a survey response rate for a survey advertised on Facebook, but it is possible to calculate the survey completion rate (Brickman Bhutta, 2012). This is done by dividing the number of participants who completed the survey by the number of participants who engaged the survey. A total of 62 participants engaged the survey and 50 participants answered at least three questions on the survey; giving the survey a completion rate of 80.64%.

3.3 Facebook Support Group Demographics

To better describe the common and unique demographics of each Facebook support group; the demographics of each group will be examined separately. Group A had a total of 5,218 members at the time the survey was published and advertised (Women's Adrenal Insufficiency Public Support Group (2022). Only 4,000 of those members were living in the U.S. and eligible to participate in the survey. Group A is a private support group specifically for individuals who identify as women and group administrators deny admission to anyone who identifies as male as it violates the rules. There are no exceptions to this rule and strict enforcement has led to a membership that is 99% female (Figure 3.1).

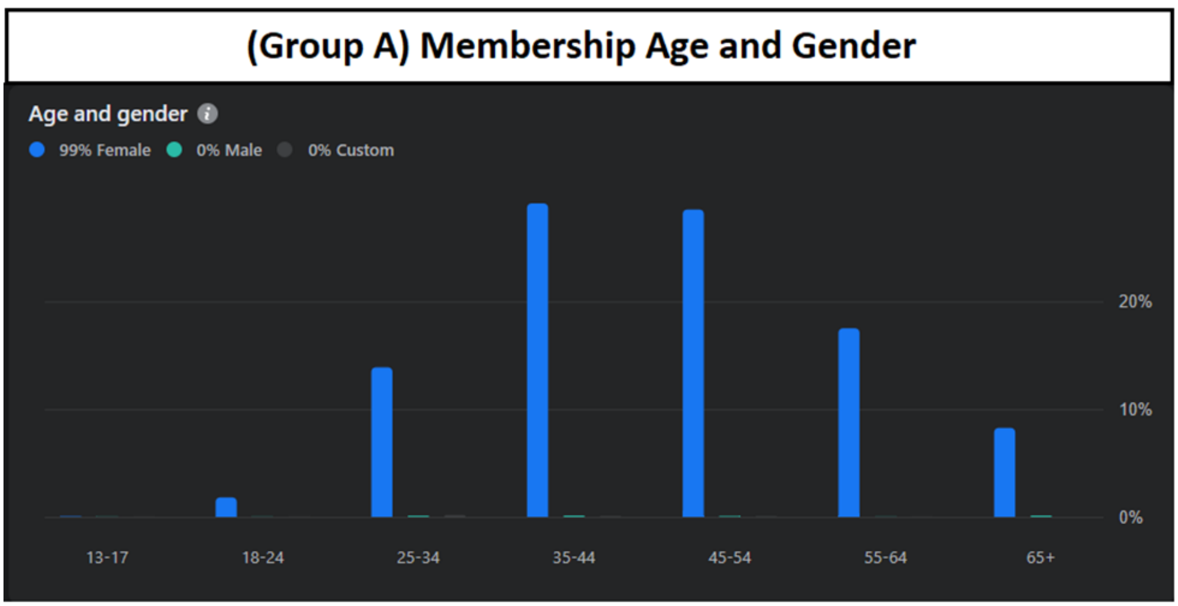

Figure 3.1: Group A Membership Population by Age and Gender (Women's Adrenal Insufficiency Public Support Group (2022)

Members of Group A must be at least 18 years old to join, but only 2% of members fall between the 18-24 age range (Figure 3.1). Member ages trend upwards with age; 25–34 year-old members make up 15% of the population while members aged 33-44 and 45-54 each account for 29% of members; making both groups tied for the majority. The age of members then trends downward with the 55-64 year-old population accounting for 17% of membership and those who are 65 and older only make up 8% of the population.

Group B is much smaller than Group A with a total of 1,468 members at the time of publication of the survey; 1,087 of which met the survey requirement of living in the U.S.. Group B is open to any individual regardless of gender, but rules are in place to limit membership (Cortisol Pump Public Group (2022). Such rules include a requirement for members to be over the age of 18 and members must have or be in the process of utilizing a specific piece of medical equipment used in the treatment of adrenal insufficiency. This has led to a slightly more diverse gender demographic than Group A; with 91% of members self-identifying as female, 8% as male, and 1% self-identifying as other (Figure 3.2).

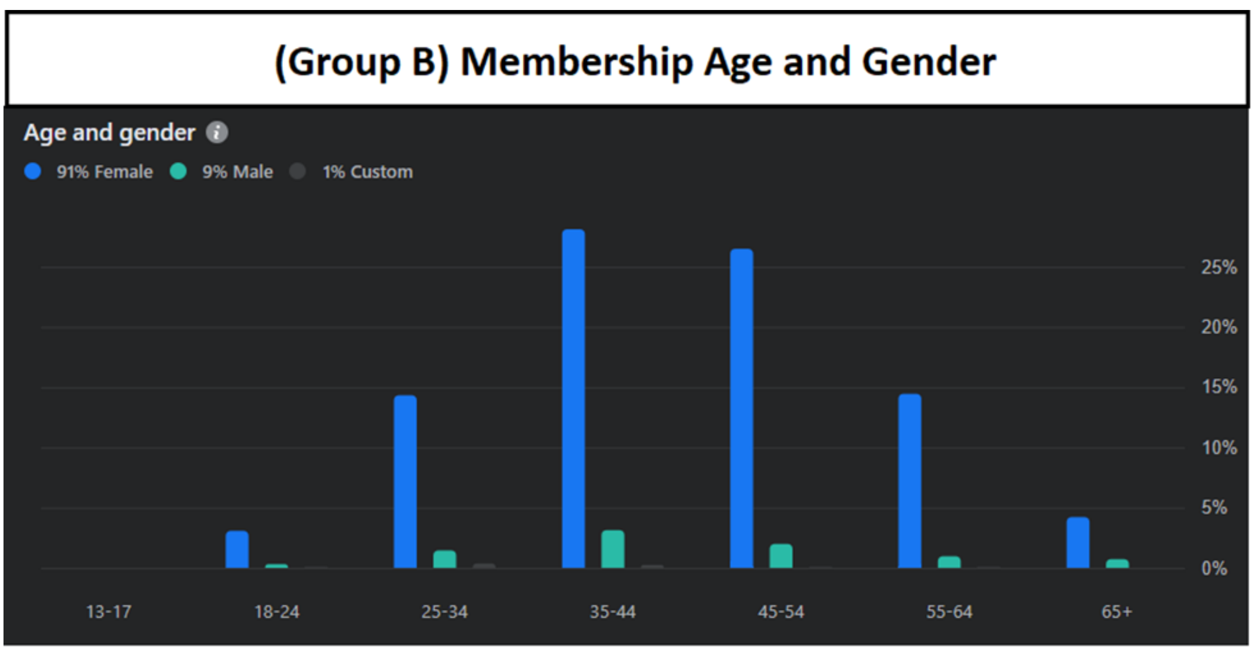

Figure 3.2: Group A Membership Population by Age and Gender (Cortisol Pump Public Group (2022)

The member ages of Group B trend similarly as in Group A. Members in the 18-24 age bracket account for 3% of the support group; 25-34 year-old population at 17%; 35–44 year-olds had the majority at 32% and closely followed by the 45-54 age bracket with 29% of Group

B study population. Membership then trends downwards with the 55-64 year-old age bracket at 15% of the population followed by individuals 65 and older accounting for 5% of the membership. The demographics of these support groups thus influenced study participant demographics, which will be considered in the discussion and limitation sections.

3.4 Data Collection and Analysis

The survey consisted primarily of closed-response questions which were analyzed using descriptive statistics. Closed-response questions examined demographic data of participants, access to healthcare providers, comfort levels accessing healthcare providers, and usage of healthcare during the first twelve months of the COVID-19 pandemic. Utilizing logistic regression models, this study attempted to predict which delivery method of non-emergency medical care (i.e., in-person visit or telehealth visit) individuals with chronic health conditions prefer. All response data was imported from the Qualtrics survey platform and uploaded into SPSS; a statistic software designed for social sciences. The logistic regression models in this study were chosen due to the dichotomous nature of the dependent variable (i.e., 0 = in-person visit and 1 = telehealth visit) and that this variable collected 50 responses. Logistic models that had two or more independent variables were tested for multicollinearity by utilizing the Pearson bivariate correlation for variables with continuous values and the Spearman bivariate correlation model for variables with ranked values. This study also includes an independent-samples t-test model which compares the means of the continuous dependent (i.e., number of round-trip miles to visit healthcare providers in person) and the independent variable divided into two groups (Group 1 or I = In-person visit, and Group 2 or (T) = Telehealth visit) (Yockey, 2008). Additionally, a chi-square test of independence was included to determine if there is a relationship between two categorical variables (i.e., Preference of non-emergency healthcare and geographic location) (Yockey, 2008). Finally, the survey featured several open-response questions which allowed for respondents to describe their experience utilizing telemedicine during the first twelve months of the COVID-19 pandemic. Open-response questions were analyzed using quantitative content analysis (Krippendorff, 2013).

CHAPTER 4

FINDINGS

4.1 Respondent Experience Utilizing Telehealth

A respondent's positive and negative descriptions of their experience utilizing telemedicine is important to understanding why an individual might prefer the use of telemedicine over in-person visits and vice-versa for non-emergency healthcare needs. To do this, respondents were asked to provide three words that described their experience utilizing telehealth during the first twelve months of the COVID-19 pandemic. Responses of the 24 respondents that participated in this question were extracted and categorized into columns based on their positive and negative connotations with calculated frequencies (Table 4.1). The most frequent word used to describe respondent experience with telemedicine was "convenient" followed by "efficient," "easy," "fast," and "safe." Overall, the majority of words were positive in nature, but for some, their experiences were less positive as represented by words such as "lacking," "glitchy," "difficult," and "sub-standard." It is important to note these descriptions describe both the participant's experience using the technology and the care received through telehealth visits.

Respondents were also asked why they would or would not utilize telemedicine post-pandemic. Out of 23 responses, only three respondents said they would rather not utilize telemedicine going forward with all three saying that their healthcare needs require a hands-on in-person examination from their doctors. One individual indicated that they were hospitalized after a telehealth visit with her doctor failed to convey the severity of her illness. Of the 20 respondents who said they would continue to utilize telemedicine, the most common reason given was the ease of access to healthcare providers and the saving of time, energy, and the cost of travel and missed opportunity (i.e., the financial cost of missing work or other money-making opportunities).

Table 4.1: Respondent Descriptor Words of their Experience Utilizing Telemedicine

Positive Descriptors	Frequency
Convenient	9
Efficient	4
Easy	3
Fast	3
Safe	3
Focused	2
Thorough	2
Accessible	1
Accommodating	1
Better-than-nothing	1
Comfortable	1
Doctors-listen-more	1
Easier	1
Effective	1
Energy-saving	1
Excellent	1
Germ-free	1
Necessary	1
Not-wearing-pants	1
On-point	1
Pleasant	1
Precise	1
Private	1
Productive	1
Prompt	1
Relaxed	1
Short	1
To-the-point	1
Useful	1
Total	**48**

Negative Descriptors	Frequency
Lacking	2
Awkward	1
Difficult	1
Glitchy	1
Horrible	1
Impersonal	1
Inadequate	1
Inconsistent	1
Subpar	1
Sub-standard	1
Total	**11**

To quote one individual, "telemedicine over zoom or the phone is far easier for routine care than to load wheelchair, ventilator, IV pumps, medical supply bags and more into a clunky large van, drive for an hour one way, unload and reload, and drive all over again." Many respondents in favor of continuing the use of telemedicine visits noted that they still prefer in-person visits for more complex issues. This may be a factor in why the number of telehealth visits on its own is not enough to predict a respondent's preference for in-person or telehealth visits for their non-emergency healthcare needs.

4.2 Preferred Delivery of Non-Emergency Healthcare

The models in this study aim to predict which method of non-emergency healthcare delivery (i.e., in-person, or telehealth) women with chronic health conditions prefer after their experience utilizing telemedicine during the first twelve months of the COVID-19 Pandemic. First, I examined the percentage of participants who preferred in-person visits compared to those who preferred telehealth visits. Figure 4.1 shows a majority of participants prefer telehealth for non-emergency visits at 56%, followed closely by in-person visits at 44%.

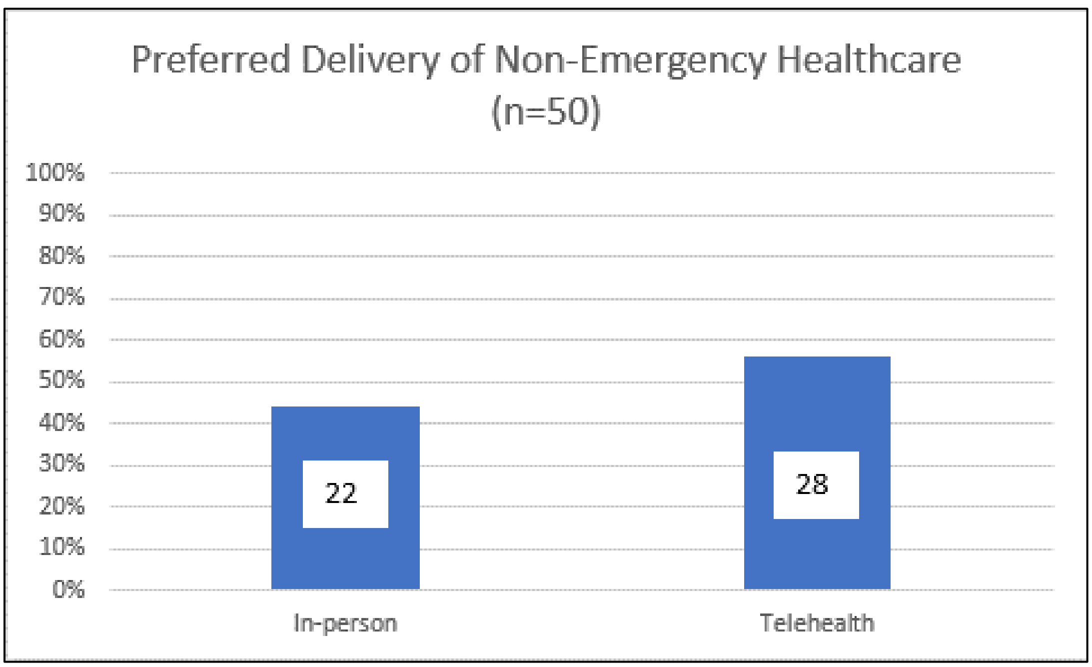

Figure 4.1: Study Population and Preferred Delivery of Non-emergency Healthcare

4.3 Demographic Characteristics

The descriptive statistics identified some general demographic characteristics of the study participants. Respondent ages across both Facebook groups (Figure 4.2) are very similar, but varied greatly from that of the overall population of male and female Facebook users in the United States as of December 2021 (Figure 4.3; Dixon, 2022). The two largest age groups of respondents were the 35-44 year-old group at 34% followed by the 45-54 year-old age bracket. Whereas the two largest age groups for the United States as a whole were the 25-34 year-old group at 26.4% and the 35-44 year-old age group with 18.1% overall (Dixon, 2022). The smallest age group of study respondents was the 18-24 year-old age group; significantly smaller than 16.2% of total United States Facebook users in the same age bracket. Age was associated with preferences for mode of healthcare delivery. Specifically, study respondents between the ages of 18-34 and over 55 indicated that they prefer in-person healthcare for their non-emergency healthcare needs (Figure 4.4).

With 41.9%, a majority of participants reported an annual household income of $100,000 plus (Figure 4.5); far greater than the United States median income of $67,521 reported in the 2020 census (Shrider et al., 2021). In Figure 4.6, which compares age and annual household income, the annual household income of the largest age group (i.e., 35-44 year-olds) is falls mostly in the range of $80,000-$99,999 per year. The second largest annual household income group of the 35-44 year-old participants exceeds $100,000 per year. Out of the three geographic locations (i.e., urban, suburban, and rural), a majority of study participants identified their household as being in a suburban geographic location (Figure 4.7). Most participants who reported an annual household income exceeding $100,000 live in suburban geographic locations.

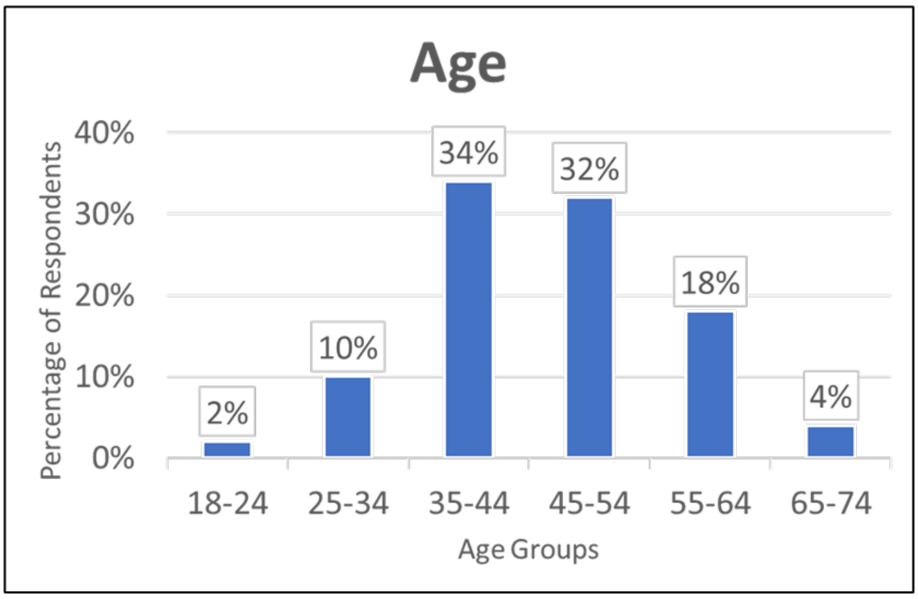

Figure 4.2: Respondent Ages

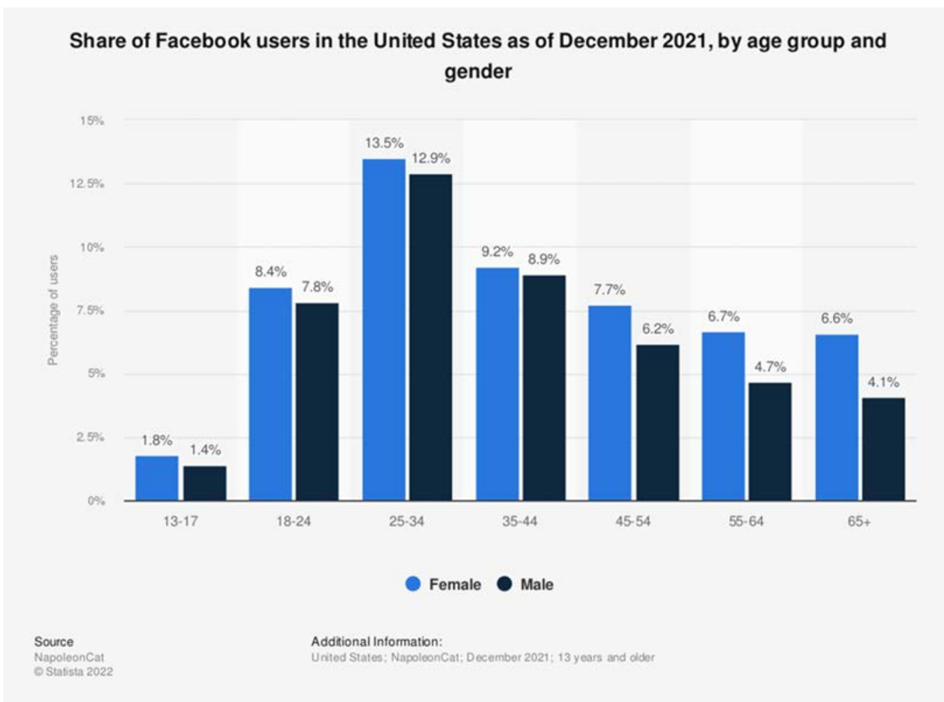

Figure 4.3: U.S. Facebook Users by Age and Gender (Dixon, 2022)

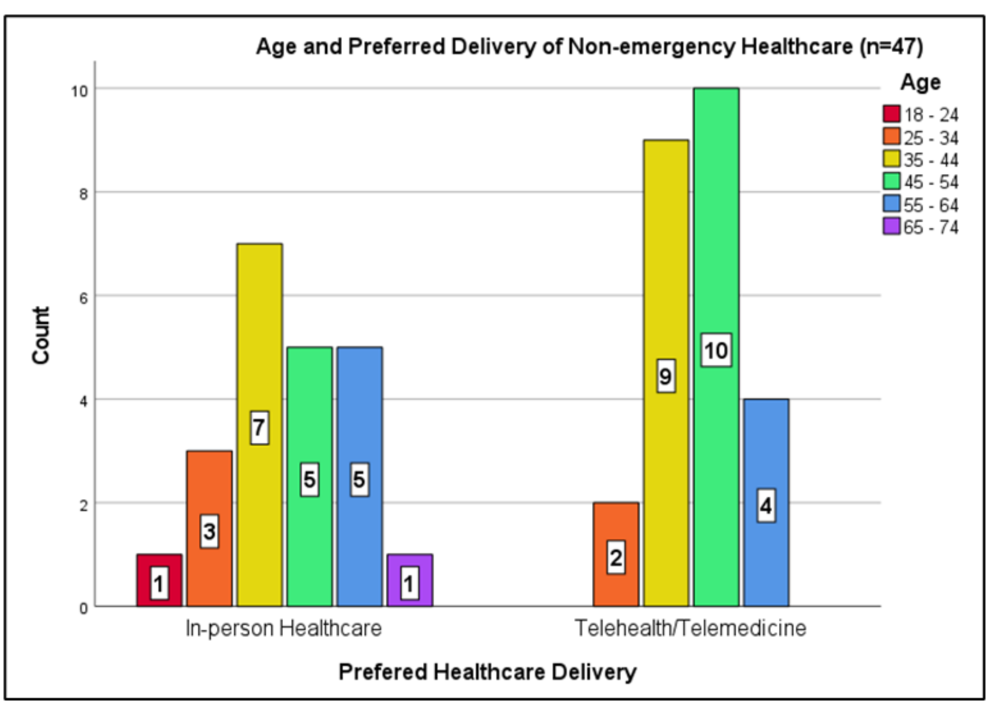

Figure 4.4: Age and Preferred Delivery of Non-emergency Healthcare

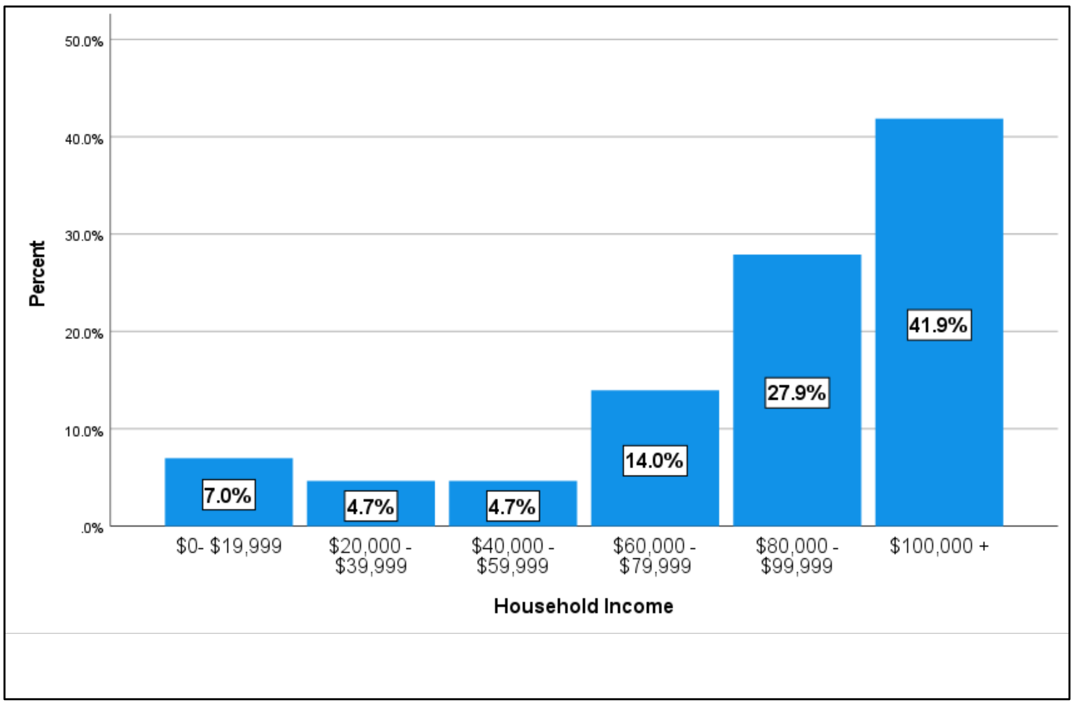

Figure 4.5: Respondent Annual Household Income

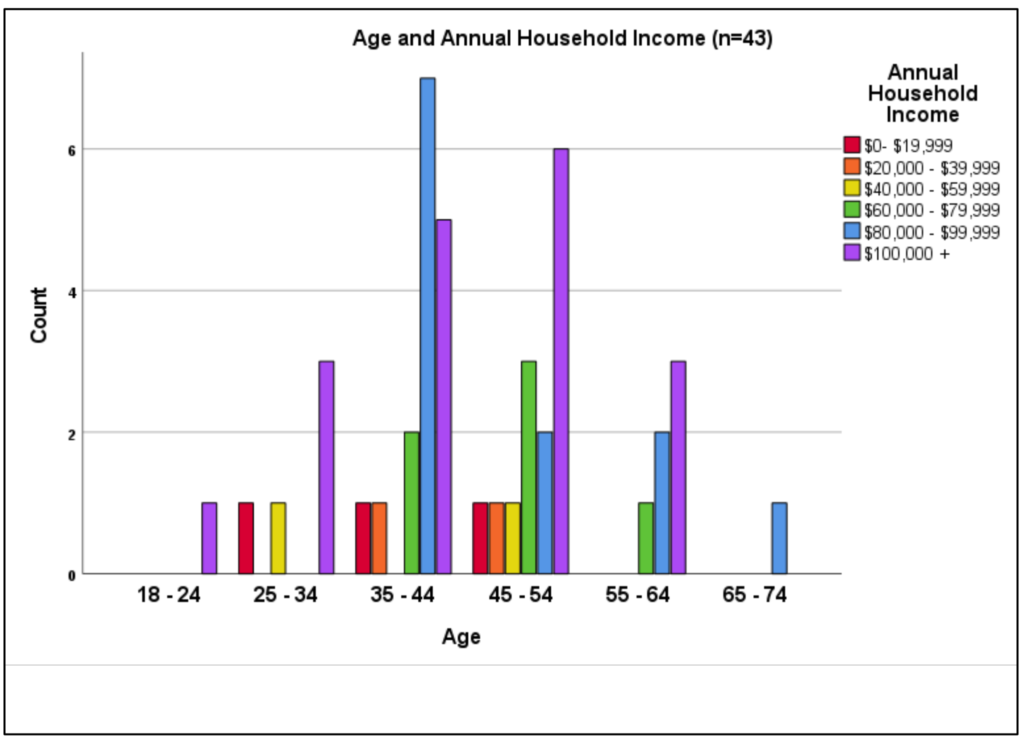

Figure 4.6: Population Age and Annual Household Income

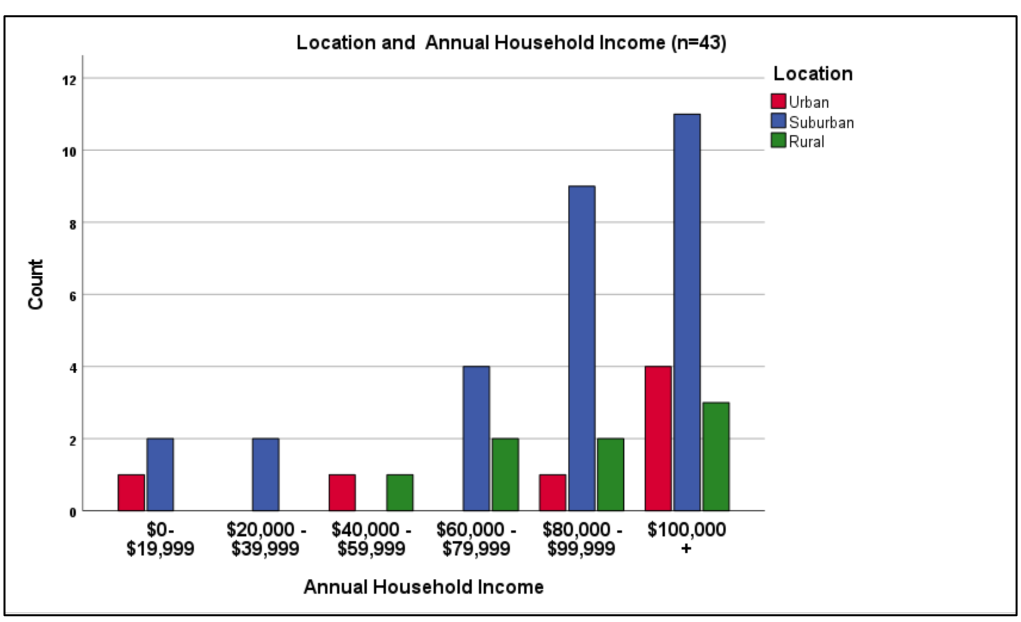

Figure 4.7: Population Geographic Location and Annual Household Income

To address RQ1, a logistic regression was preformed to test the extent to which age measured in years and annual household income measured in dollars (measured as a continuous variables) predict an individual's preferred method of non-emergency healthcare delivery (i.e., telehealth or in-person) (Robitzsch, 2020). I tested for multicollinearity between independent variables (X_1) Age and (X_2) annual household income and no issues were found. A test of the full model against the constant only model using the two predictor variables show that the model is not statistically reliable ($X^2 = 2.044$, df = 2, $p > .05$). This model fails to reject the null hypothesis; age and annual household income are not statistically significant predictors of an individual's preferred method of non-emergency healthcare delivery.

4.4 Geographic Location

Out of 47 respondents, 30 identified their geographic location as suburban (Figure 4.8). Nine respondents live in rural locations and the remaining eight respondents live in urban geographic locations. In visiting primary care providers in-person, respondents recorded a range of 2-550 miles and a median of 12 miles round-trip. When visiting specialists in-person, respondents recorded a range of 5-1500 miles and a median of 45 miles. Respondents round-trip travel averaged 31 miles to visit with their primary care providers and nearly four times further at 121 miles round-trip to visit with specialists (Figure 4.9). When comparing geographic location and preferred non-emergency healthcare delivery, participants who identified their geographic location as suburban were evenly divided with 15 preferring in-person health care and 15 preferring telehealth visits (Figure 4.10). Participants who identified their geographic locations as being urban and rural both had higher numbers of participants chose telehealth visits over in-person visits as their preferred method of non-emergency healthcare.

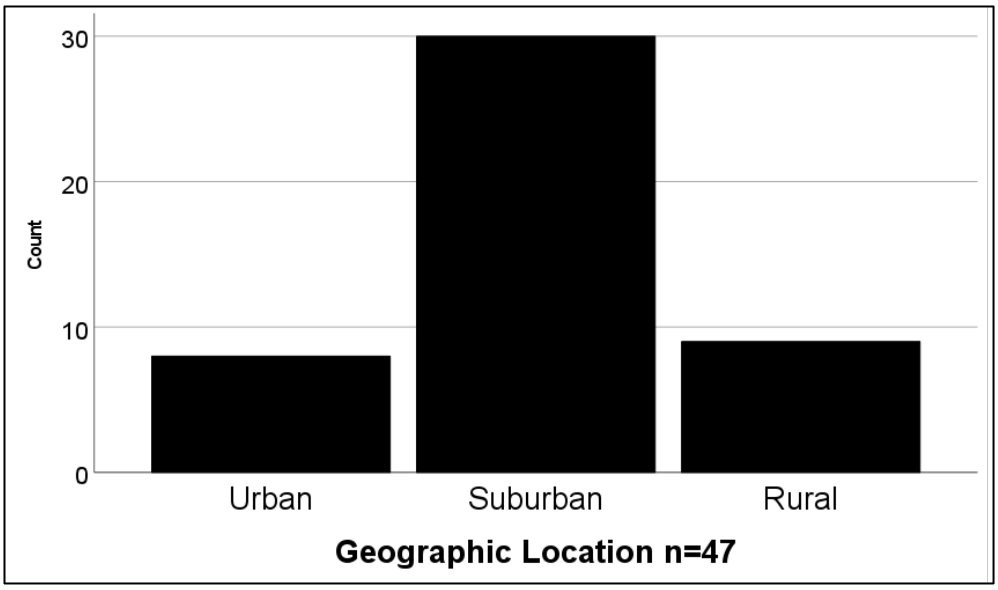

Figure 4.8: Geographic Location of Respondents

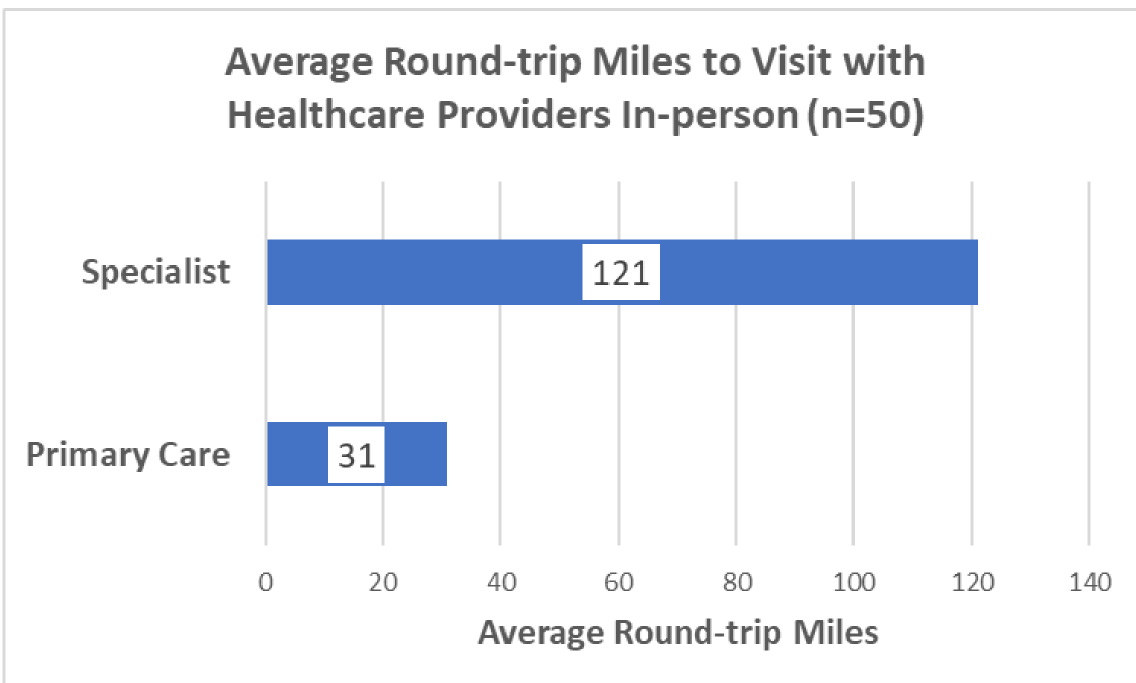

Figure 4.9: Average Round-trip Miles to Visit with Primary Care and Specialist Providers

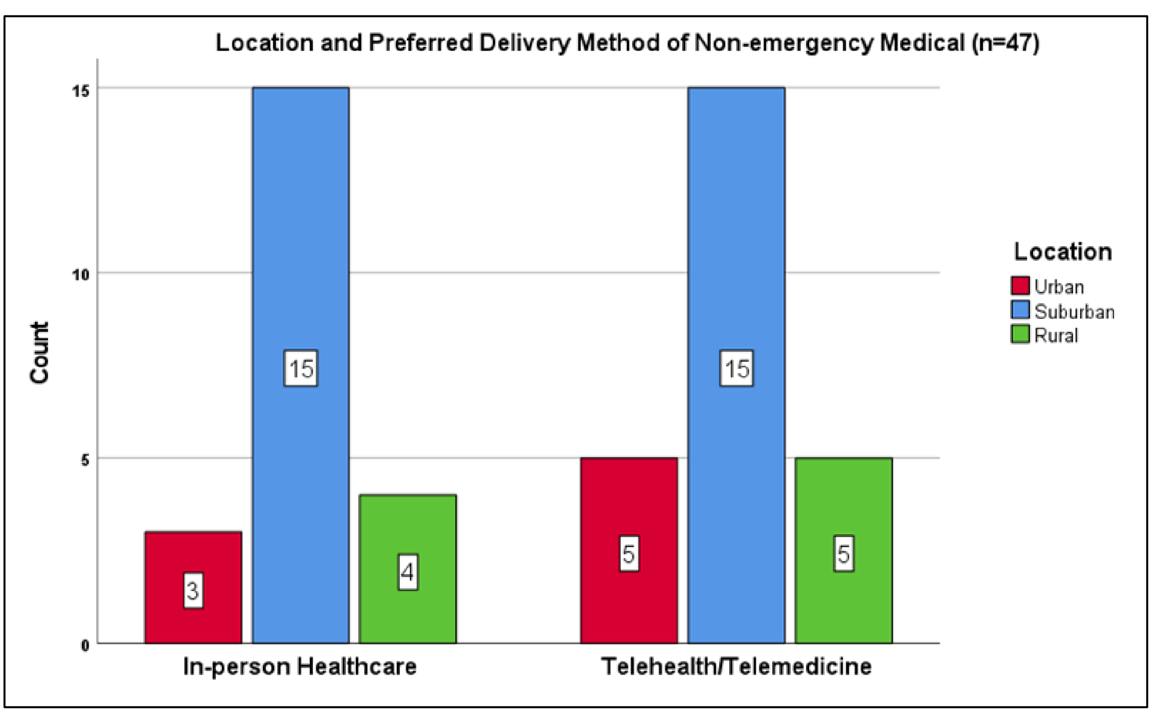

Figure 4.10: Population Geographic Location and Preferred Delivery of Non-emergency Healthcare

To address RQ2, a logistic regression analysis was preformed to test the extent in which living in a rural geographic location and the distance an individual must travel round-trip to visit with primary care providers and specialist predict an individual's preferred method of non-emergency healthcare delivery (i.e., telehealth or in-person). I tested for multicollinearity between independent variables (X_1) rural geographic location, (X_2) roundtrip miles to visit primary care provider and (X_3) round-trip miles to visit with specialists and no issues were found. A test of the full model against the constant only model using the three predictor variables show that the model is not statistically reliable ($X^2 = 3.417$, df = 3, $p > .05$). The model fails to reject the null hypothesis; living in a rural geographic location and the miles an individual must travel round-trip to visit with primary and specialist healthcare providers are not statistically significant predictors of an individual's preferred method of non-emergency healthcare delivery.

Table 4.2: RQ3 Independent-Samples *t*-Test

Group Statistics

	Prefered Healthcare Delivery	N	Mean	Std. Deviation	Std. Error Mean
Miles Primary	In-person Healthcare	22	46.11	115.044	24.528
	Telehealth/Telemedicine	28	18.79	18.713	3.536

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Miles Primary	Equal variances assumed	4.387	.042	1.240	48	.221	27.328	22.045	-16.997	71.653
	Equal variances not assumed			1.103	21.875	.282	27.328	24.781	-24.082	78.738

To address RQ3, an independent-samples *t*-test was conducted, and the findings indicate that there is not a significant difference in the average round-trip miles driven to visit with primary care providers between those who prefer in-person healthcare ($M = 46.11$, SD =

115.044) and those who prefer telehealth visits (M = 18.79, SD = 18.79); (t = 1.103, df = 21.875, p>.05) (Table 4.2). This model fails to reject the null hypothesis. There is not a significant difference in the average round-trip miles driven between those who preferred in-person visits and those who prefer telehealth visits with healthcare providers.

To address RQ4, a chi-square test of independence was conducted and there is not a significant relationship between preferred healthcare delivery and geographic location X^2 = .065, df = 1, p > .05 (Table 4.3). The overall model fails to reject the null hypothesis; preferred healthcare delivery does not vary by living in a rural geographic location.

Table 4.3: RQ4 Chi-Square Test of Independence

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Prefered Healthcare Delivery * Require Assistance	47	94.0%	3	6.0%	50	100.0%

Prefered Healthcare Delivery * Require Assistance Crosstabulation

Count

		Require Assistance		
		Does not require assistance	Requires Assistance	Total
Prefered Healthcare Delivery	In-person Visits	14	8	22
	Telehealth Visits	15	10	25
Total		29	18	47

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.065[a]	1	.798		
Continuity Correction[b]	.000	1	1.000		
Likelihood Ratio	.066	1	.798		
Fisher's Exact Test				1.000	.518
Linear-by-Linear Association	.064	1	.800		
N of Valid Cases	47				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.43.

b. Computed only for a 2x2 table

4.5 Accessibility

Survey participants reported a range of access issues related to their healthcare. Out of 47 respondents, a total of 7 (14.9%) frequently require assistance (e.g., transportation assistance, American Sign Language interpreter, mobility assistance) to access in-person healthcare (Figure 4.11). Four of those respondents identified their geographic location as suburban and three identified their geographic location as rural. Eleven respondents only occasionally require assistance with rural and urban locations having a total of two respondents each while suburban geographic locations had a total of seven. Five out of seven respondents who frequently require assistance to access in-person healthcare prefer telemedicine for non-emergency healthcare needs (Figure 4.12). Those who only occasionally require assistance and those who never require assistance to access in-person healthcare were nearly equally divided between preferring in-person visits and telehealth visits going forward. When it comes to having access telehealth services, 45 out of 50 respondents had access to a reliable internet connection and 43 of 50 had access to a smartphone device during the first twelve months of the COVID-19 pandemic.

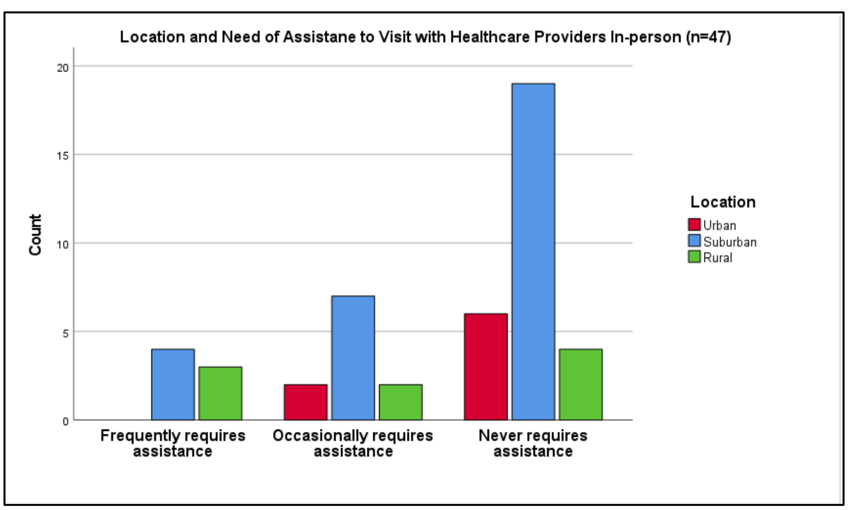

Figure 4.11: Respondent Geographic Location and Need of Assistance

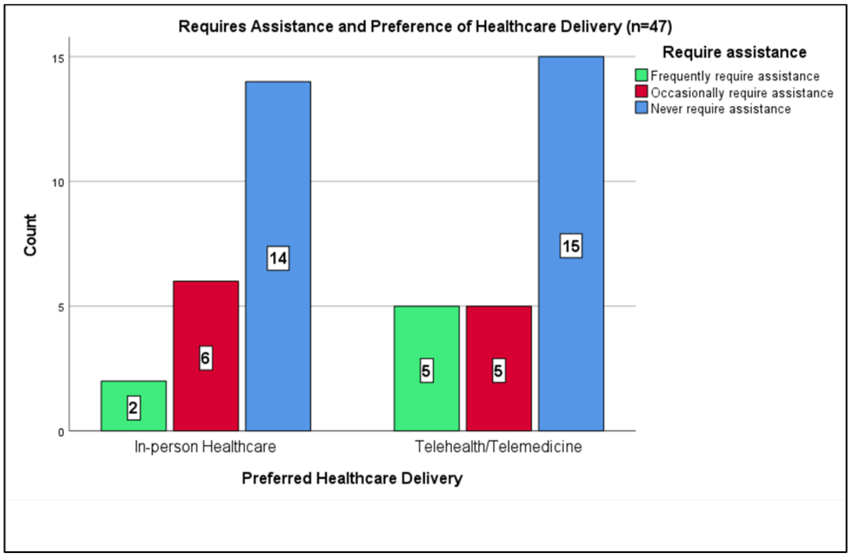

Figure 4.12: Respondent Need of Assistance and Preferred Delivery of Non-emergency Healthcare

To address RQ5, a logistic regression was preformed to test the extent to which access to a reliable internet connection and an individual's need of assistance to access healthcare professionals predict an individual's preferred method of non-emergency healthcare delivery. I tested for multicollinearity between independent variables (X_1) access to a reliable internet connection, and the (X_2) need of assistance to access in-person healthcare. No issues were found. A test of the full model against the constant only model using the two predictor variables show that the model is not statistically reliable ($X^2 = .068$, df = 2, $p > .05$). This model fails to reject the null hypothesis; access to a reliable internet connection and individual's need of assistance to access in-person healthcare are not statistically significant predictors of an individual's preferred method of non-emergency healthcare delivery.

4.6 Comfort

Beyond access, study participants also reported a range of comfort-levels related to using in-person or telehealth for healthcare. Out of 47 respondents, 36.2% felt somewhat uncomfortable in visiting with healthcare providers in-person during the first twelve months of the COVID-19 pandemic. Approximately 14.9% of respondents felt extremely uncomfortable visiting with healthcare providers in-person (Figure 4.13). Those who felt somewhat comfortable and those who felt extremely comfortable had an equal number of respondents with 21.3% of respondents each; only 6.4% of respondents felt neither comfortable nor uncomfortable in visiting healthcare providers in person. Those who felt comfortable in visiting with healthcare providers in-person more often prefer in-person healthcare going forward. Respondents who felt neither comfortable nor uncomfortable all prefer telemedicine visits (Figure 4.14).

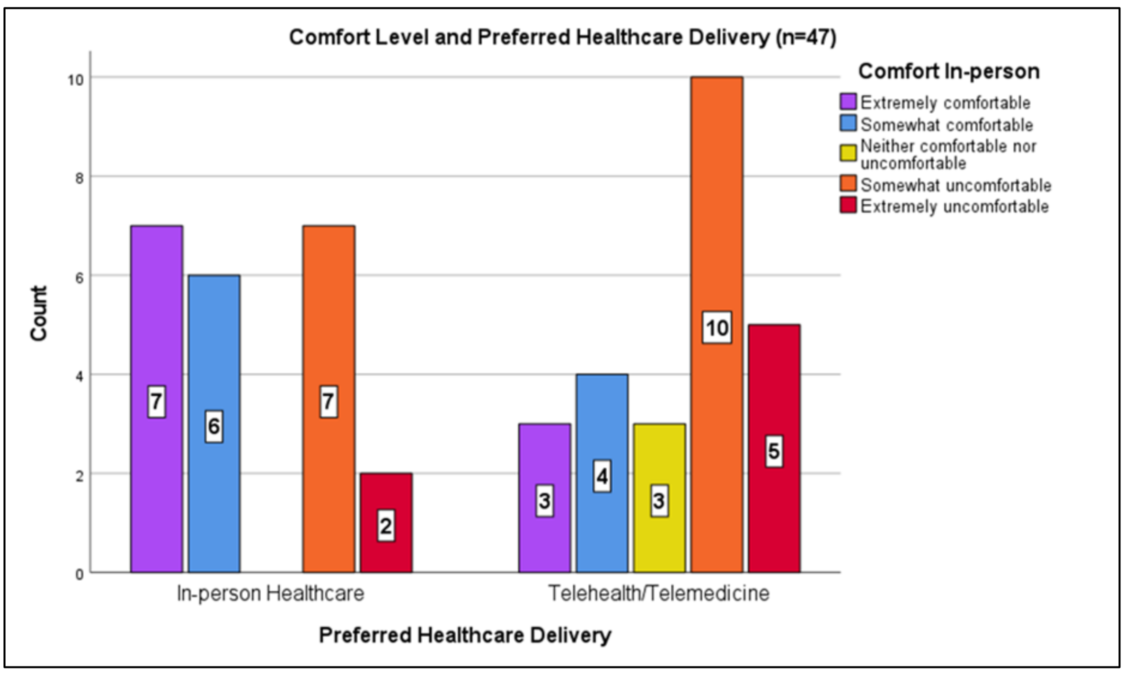

Figure 4.13: Comfort Level Visiting Healthcare Providers In-person during the First Twelve Months of the COVID-19 Pandemic and Preferred Delivery Method of Non-emergency Healthcare

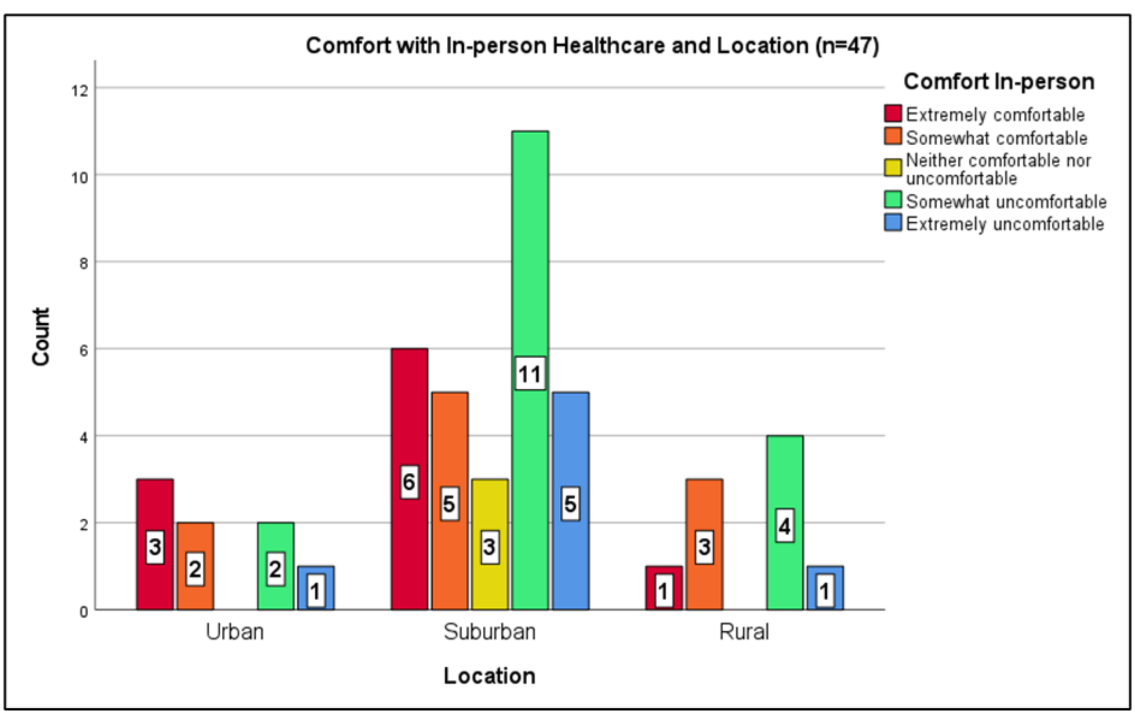

Figure 4.14: Comfort Level Visiting Healthcare Providers In-person during the First Twelve Months of the COVID-19 Pandemic and Age

Comfort also extended to using technology and software to access telehealth services. When asked to rate their level of comfort in navigating new and unfamiliar webpages and web-based communication applications necessary for accessing telehealth services, 53.3% of respondents feel extremely comfortable and 28.8% of respondents feel somewhat uncomfortable (Figure 4.15). Only 4.4% of respondents feel extremely uncomfortable and only 2.2% of respondents feel somewhat uncomfortable. 11.1% of respondents feel neither comfortable nor uncomfortable.

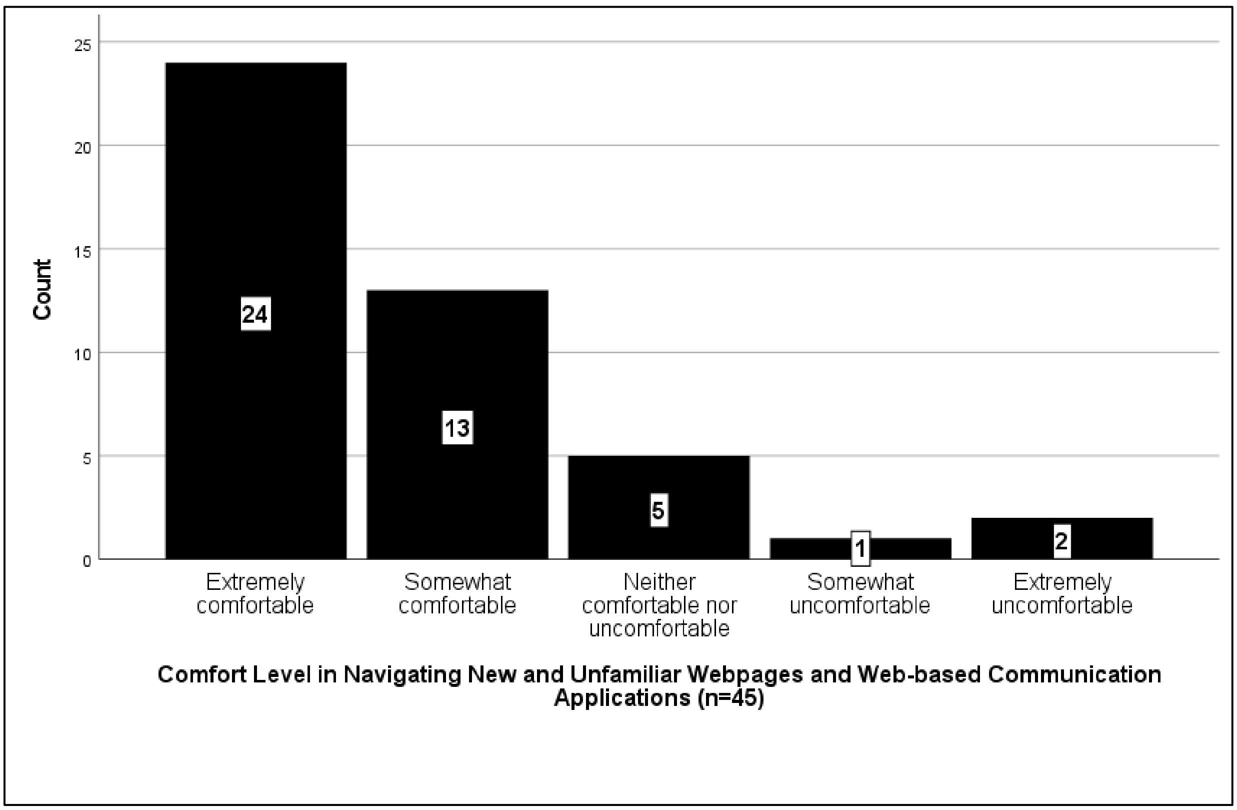

Figure 4.15: Comfort Navigating New and Unfamiliar Webpages and Web-based Applications and Preferred Delivery Method of Non-emergency Healthcare

To address RQ6, a logistic regression was preformed to test the extent in which an individual's level of comfort navigating new and unfamiliar webpages and web-based applications, and comfort level in visiting with healthcare providers in-person during the first 12 months of the COVID-19 pandemic predict an individual's preferred method on non-emergency healthcare delivery. I tested for multicollinearity between independent variables (X_1) comfort level navigating new and unfamiliar webpages and web-based applications, and (X_2) comfort level in visiting with healthcare providers in-person during the first twelve months of the pandemic; no issues were found (Table 4.4). A test of the full model against the constant only model using the two predictor variables show that the model is statistically reliable at the .1 level ($X^2 = .4723$, df = 2, $p < .1$). The -2LL yielded a value of 57.460. The Nagelkerke R^2 (.113) and Cox and Snell (.1) show a weak association between the prediction and the grouping. Overall, the model correctly classified 68.9% of all the cases, with 57.1% those who prefer in-person visits and 79.2% of those who prefer telehealth visits. The Wald criterion indicates that comfort visiting healthcare providers in-person (B = .410, Wald = 3.082, $p < .1$) is a significant predictor of preferred method of non-emergency healthcare delivery. The Wald criterion also indicates that comfort in navigating new and unfamiliar webpages and web-based applications (B = -.450, Wald = 1.903, $p > .1$) is not a significant predictor of preferred method of non-emergency healthcare delivery. The Odds ratio indicates that on average, a one unit increase in (x_2) comfort level visiting with healthcare providers in-person, increases the odds of having (Y) preferred healthcare delivery by 1.506, holding all other variables constant. This model has a 90% probability that the alternative hypothesis is true; comfort level in navigating new and unfamiliar webpages and web-based applications necessary for the utilization of telemedicine, and an individual's level of comfort in visiting with healthcare providers in-person during the first twelve months of the COVID-19 pandemic are statistically significant predictors of an individual's preferred method of non-emergency healthcare delivery.

Table 4.4: RQ6 Logistic Regression Model

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	4.723	2	.094
	Block	4.723	2	.094
	Model	4.723	2	.094

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	57.460[a]	.100	.133

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table[a]

Observed			Predicted: Prefered Healthcare Delivery: In-person Healthcare	Predicted: Prefered Healthcare Delivery: Telehealth/Telemedicine	Predicted: Percentage Correct
Step 1	Prefered Healthcare Delivery	In-person Healthcare	12	9	57.1
		Telehealth/Telemedicine	5	19	79.2
	Overall Percentage				68.9

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	95% C.I.for EXP(B) Upper
Step 1[a]	Comfort In-person	.410	.233	3.082	1	.079	1.506	.953	2.380
	Navigating Webpages	-.450	.326	1.903	1	.168	.638	.337	1.208
	Constant	-.308	.861	.128	1	.720	.735		

a. Variable(s) entered on step 1: Comfort In-person, Navigating Webpages.

4.7 Healthcare Visits

When looking at the average number of times respondents had visited with healthcare providers during the first twelve months of the COVID-19 pandemic, respondents who visited with primary care providers in-person had a range of 0-50 visits, a median of three visits and an average of 4.04 visits (Figure 4.16). Respondents who visited with primary care providers utilizing telehealth recorded a range of 0-50 visits, a median of four visits and an average of 5.31 visits. In-person visits with specialist was relatively low with a range of 0-10 visits, a median of two visits and an average of 2.28 visits. Telehealth visits with specialist had a range of 0-45 visits, a median of three visits and an average of 7.51 visits.

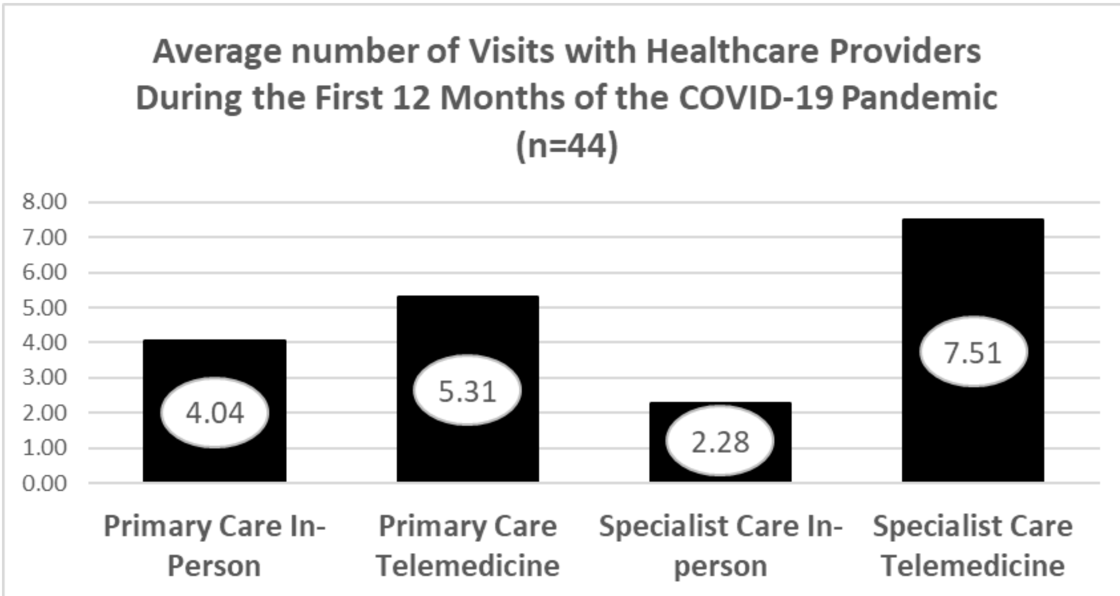

Figure 4.16: Average Number of Visits with Primary Care and Specialist both In-person and Telehealth

4.8 Telehealth Usage

Finally, a logistic regression was preformed to test the extent in which the number of times an individual has utilized telemedicine during the first twelve months of the COVID-19 pandemic predict an individual's preferred method of non-emergency healthcare delivery (i.e., telehealth or in-person; RQ7). A test of the full model against the constant only model using the two predictor variables show that the model is not statistically reliable ($X^2 = .015$, df = 1, $p > .05$). This model fails to reject the null hypothesis; the number of times an individual has utilized telemedicine in the first twelve months of the COVID-19 pandemic is not statistically significant predictors of an individual's preferred method of non-emergency healthcare delivery.

CHAPTER 5

DISCUSSION

The COVID-19 pandemic brought with it many changes to the American health care system and the delivery of healthcare services to patients. This study sought to better understand the experiences of people with chronic health conditions experiences utilizing in-person and telemedicine during the first twelve months of the COVID-19 pandemic. This research attempted to identify which variables influenced their preferred delivery method of non-emergency healthcare. Unfortunately, none of the models in this study were statistically significant and all models failed to reject their corresponding null hypotheses. This may reflect the small sample size of the study, which is considered in more depth in the study limitations section.

Respondents were nearly evenly divided in their preference with 44% preferring in-person healthcare and 56% preferring telemedicine, yet the reported experience of respondents utilizing telemedicine in the first year was mostly positive. Studies examining people with chronic health conditions and their utilization of telemedicine during the COVID-19 pandemic are still very limited, but one study of patients receiving palliative care utilizing telehealth services found that 61% of respondents preferred telehealth visits even after the risk of COVID-19 has ceased (Broglio and Kirkland, 2021). A study that focused on the perceptions of telemedicine amid the COVID-19 pandemic found that 72% of their respondents preferred the utilization of telemedicine post-pandemic (Haque et al., 2022). In comparison with these published studies, respondents of this study exhibited a lower preference for telehealth service than in-person visits. The differences in the population's preference for telemedicine or in-person healthcare may be due to the complexity of a patient's healthcare needs. One study found that individuals with chronic pain who have higher mean levels of pain and anxiety are more likely to feel that telemedicine restricts their treatment options and are less likely to prefer telemedicine visits during the COVID-19 pandemic (Harnik et al., 2021). This could indicate that participants of this study may have more complex healthcare needs that require a more hands-on approach with healthcare providers than the populations of the other two similar studies.

A study of ambulatory care patients during the COVID-19 pandemic found that patients 55 years-old and younger are more likely to utilize telemedicine than someone between the ages of 55 and 74. Patients over 74 are even less likely to utilize telemedicine (Eberly et al., 2020). This study observed similar findings in that more respondents in the 35 to 54 age ranges prefer to utilize telemedicine over in-person healthcare (Figure 4.4). Whereas the majority of respondents between the ages of 18 to 34 and over 55 prefer in-person healthcare for non-emergency healthcare needs.

While household income was expected to influence healthcare delivery preferences, this study did not find a significant relationship between those two variables. The U.S. Department of Health and Human Services has determined that a household size of one with an annual income of $13,590 and below live in poverty and for a household size of four, $27,750 and under demarcates the poverty line (HHS, 2022). Considering that 25% of disabled individuals in the United States between the ages of 18 and 64 live in poverty, yet nearly 89% of this study's respondents have an annual household income that exceeds $40,000 placing them well above the federal poverty level (Shrider et al., 2020), suggesting that the study participants are not reflective of the general population. The lower rates of poverty in this study population may be due to the method of distribution and access of the survey through Facebook and Qualtrics. The study population is limited to individuals who have access a computer or a smart device and haves the internet connection necessary to complete the online survey. Those living in poverty are more likely to have technological barriers that would prevent or hinder their access to the survey and are likely under-represented in this study (Nouri et al., 2020).

In this study, I tried to determine the extent in which age and annual household income can predict an individual's preference for the delivery of non-emergency healthcare (RQ1). Unfortunately, the model failed to reject the null hypothesis; leading me to consider that my variables for age and income were oversimplified. Lumping respondents into age brackets fails to consider the personal life experiences of respondents and how those life experiences have shaped their competence levels and desire to utilize technology necessary for the utilization of telehealth services. When I examined annual household income, I did not account for a respondents' cost of living. An individual could have an annual household income well above the U.S. median, but the cost of living may be high, which is common especially in urban areas, opening the possibility of reliable internet or a smart device being unobtainable for some.

I attempted to determine what extent living in a rural geographic location and the average number of round-trip miles a respondent must travel to visit with primary healthcare providers and specialist predict an individual's preference of delivery method for non-emergency healthcare (RQ2). The model was not statistically significant and failed to reject the null hypothesis. Telemedicine visits save patients from having to travel back and forth to visit with healthcare providers in-person. The findings of this study show that telemedicine visits saved respondents an average of 31 round-trip miles when visiting with primary care providers and 121 round-trip miles visiting with specialists. The findings are consistent with past findings of a study conducted 2020 which examined the uptake of virtual visits of geriatric primary care clinic during the COVID-19 pandemic (Dewar et al., 2020). In that study, researchers found that patients who switched from in-person to telehealth visits with their primary care provider saved an average of 24 round-trip miles per visit. Similarly, a study that examined the efficiency and cost-effectiveness of telemedicine, findings showed that respondents saved and average of 119 round-trip miles when visiting with their parathyroid specialist (Urquhart et al., 2011). I tried to find a significant difference between the round-trip miles traveled to visit with primary healthcare providers and respondent preference of in-person or telehealth visits for non-emergency healthcare with RQ3. Unfortunately, no significant difference was found; leading me to consider the possibility that other factors such as the nature of the healthcare visit and the overall health of the respondents may be more of a contributing factor in preference amongst the surveyed population.

Approximately, 64% of respondents live in suburban areas; 19% in rural areas; and 17% in urban areas (Figure 4.8); differing from the total U.S. population of 55% of individuals living in suburban areas; 14% in rural areas; and 31% in urban areas (Parker et al., 2018). The difference in the study population and the total U.S. population may be due to socio-economic factors that were not figured into this study. RQ4 attempted to find a significant relationship between respondents living in rural geographic locations and their preference for in-person or telehealth visits for non-emergency healthcare. The model failed to show a significant relationship despite rural areas often facing limited healthcare providers compared to urban locations (Smith et al., 2019). Geographic location seemed to have negligible effect on a respondents preferred delivery method on non-emergency healthcare. Respondents who live in suburban areas were evenly split in their preference and those who lived in urban and rural areas only differed in preference by one and two individuals (Figure 4.10). Suburban areas were over represented and future studies could aim to achieve a greater representation from the different geographic areas to more closely match the U.S. as a whole.

In RQ5, I attempted to determine the extent a respondent's need of assistance to visit with healthcare providers in-person and their access to a reliable internet connection in their home predict a respondent's preference for in-person or telehealth visits. Unfortunately, the model was not significant, and failed to reject the null hypothesis. However, independently looking at a respondents need of assistance to access healthcare providers in-person and a respondent's access to a reliable internet connection at home separately has resulted in some interesting findings of their own.

For many individuals with chronic health conditions, assistance (e.g., transportation assistance, American Sign Language interpreter, mobility assistance) is necessary to access their healthcare provider in person. Unfortunately, telemedicine platforms are historically designed with little regard to individuals that have limited speech and those with hearing and vision loss (Valdez et al., 2021). Only 14.9% of the respondents of this study reported a frequent need of assistance to access in-person healthcare. Of those 14.9%, 71.42% of those respondents prefer telehealth visits with healthcare providers over in-person visits for their non-emergency healthcare needs (Figure 4.12).

A reliable internet connection is crucial for accessing modern web-based telemedicine platforms and at 90%, most respondents had access to a reliable internet connection in their home. This is not surprising considering that the questionnaire was only available online and accessible from two online social media centered support groups. Ten percent of respondents did not have a reliable internet connection in their homes and these individuals may have had to travel to seek telehealth services. This could subsequently hinder their ability to have private consultations with their healthcare providers when utilizing telemedicine.

The comfort level of respondents in visiting with their healthcare provider in-person during the first twelve months of the pandemic and comfort level of respondents navigating new and un-familiar webpages and web-based applications necessary for utilizing modern telehealth platforms were tested to determine what extent they predict a respondent's preference for in-person or telehealth visits going forward (RQ6). The model was significant to the .1 level, indicating that there is 90% probability that the alternative hypothesis is true. An individual's comfort level in navigating new and unfamiliar webpages and web-based applications necessary for the utilization of telemedicine, and an individual's level of comfort in visiting with healthcare providers in-person during the first twelve months of the COVID-19 pandemic are statistically significant predictors of an individual's preferred method of non-emergency healthcare delivery. The 10% probability that the null hypothesis for RQ6 is true leads me to conclude that an individual's perceived risk to the danger that COVID-19 presents to their own health is complex and personalized through life experience. For a generalized example, some individuals may not trust science and have little understanding of the dangers COVID-19 presents to themselves and to others. They may feel more comfortable taking less precautions than someone who feels uncomfortable being in public after following the science and aware of the dangers COVID-19 presents to their health. Respondents were split with 43% of respondents feeling comfortable visiting with healthcare providers in-person during the first twelve months of the COVID-19 pandemic and 51% feeling uncomfortable. Six percent of respondents felt neither comfortable nor uncomfortable. Respondents who felt uncomfortable in visiting healthcare providers in-person more often prefer telehealth visits going forward (Figure 4.13). Those who felt comfortable visiting with healthcare providers in-person more often prefer in-person healthcare going forward. Respondents who felt neither comfortable nor uncomfortable all prefer telemedicine visits. Most respondents felt comfortable navigating new and unfamiliar webpages and web-based applications necessary for utilizing telemedicine. This again is not surprising given how respondents accessed the questionnaire through a link advertised in two online social media support groups.

Respondents visited with their primary care providers in-person an average of 4.04 times and only utilized telemedicine with primary care providers an average of 5.31 times (Figure 4.16). The gap in the average number of in-person visits and telehealth visits was far greater when visiting specialists. Respondents visited specialists in-person an average number of 2.28 times but visited with their specialists an average of 7.51 times utilizing telemedicine. This leaves the question of why there is such a difference in the average number of in-person and telehealth visits between primary care providers and specialists and leading me to consider healthcare facility/system resources and the comfort level of doctors utilizing telemedicine to communicate with and treat patients. It is possible that specialists, who are more likely to be a apart of larger hospital systems or care centers, may off more telehealth services to patients than primary care physicians. RQ7 attempted to test the extent in which the number of times a respondent utilized telemedicine during the first twelve months of the COVID-19 pandemic predicts the preference for in-person or telehealth visits for non-emergency healthcare needs. Again, the model was not statistically significant and failed to reject the null hypothesis.

5.1 Limitations

This study has many limitations that prevent an accurate representation of all chronic health conditions. To start with, the study population was limited to individuals with a specific condition (i.e., adrenal insufficiency) and even though many respondents may have multiple accompanying chronic health conditions, those were not assumed or accounted for in the study. Attempts were made to distribute the survey in other Facebook support groups of varying chronic healthcare conditions, but many barriers exist that prevented that from happening. Group administrators either have longstanding rules in place against allowing the advertising of surveys within the group to protect their members or did not respond to my requests to join their private groups. Once the survey was published in the two groups that did allow for the survey to be advertised, the advertisement itself would quickly get moved lower on the support group pages as members would make new posts or comment on existing posts.

This study did not account for the politicizing of COVID-19 between democrats and republicans that was largely present and the conspiracies that circled around government health officials, leaders, and the prospect of a vaccine. These factors may have influenced a respondent's perceived risk to COVID-19 complications and the level of comfort respondents had in visiting healthcare professionals in-person. An individuals perceived risk of contracting COVID-19 to themselves and to others nor their experiences if they had been infected with COVID-19 during that first year were accounted for in this study. This study had an over representation of women respondents even though women are no more likely to experience adrenal insufficiency than men. Having an equal number of men participants would have yielded findings that are more representative of all people with a chronic health condition. Respondents were limited to those who have access to technology necessary to access and complete the questionnaire in an online platform. Those who do not have access to the necessary technology did not have the opportunity to be represented in the study. This study is further limited because it would have been inaccessible to individuals who may have adrenal insufficiency but have a physical or mental disability that would restrict them from accessing and completing the questionnaire without assistance.

The low number of respondents has made it difficult to sufficiently carry out statistical analyses. Logistic regression models require a minimum of 50 observations for each category of the dependent variable (i.e. preference of non-emergency healthcare) split evenly; 25 for in-person visits and 25 for telehealth visits. The categories of the dependent variable in this study are split 22 for in-person visits and 28 for telehealth visits, making the models not as accurate. Only three of the independent variables in the logistic regression models in this study had 50 responses. To remedy these limitations, future research should reach a larger population with more diverse demographics and gather data through other modes including in-person or phone surveys and interviews.

CHAPTER 6

CONCLUSION

The COVID-19 pandemic has been devastating for many Americans and yet it was the first in many years to overwhelm the American healthcare system even after numerous close calls in the previous two decades with SARS in 2002, H1N1 in 2009, and Ebola in 2013. Healthcare systems must continue to build telemedicine platforms into their critical infrastructure so that in the event of the next pandemic, healthcare providers will be better equipped to provide continuity of care for patients. Telehealth platforms must be accessible to as many as individuals as possible, especially for those who were left out or restricted from telemedicine care during the COVID-19 pandemic.

COVID-19 presented many unique challenges for healthcare providers and patients alike. The utilization and expansion of telemedicine became a necessity in providing a safe delivery of healthcare for healthcare providers and patients; especially for individuals with a chronic health condition that put them at higher risk of complications from a COVID-19 infection. This study dove into the experiences of a population of adrenal insufficient individuals' utilization of telemedicine in the first twelve months of the COVID-19 pandemic and the socioeconomic factors that may influence and individuals' preference for their continuation of telemedicine post-pandemic. The biggest takeaway from this study is that an individual's comfort level in visiting their healthcare providers in-person during that first year of the pandemic is a significant predictor of an individual's preference for telehealth, but the driving social and health factors that shaped an individual's perception of risk influencing their level of comfort must be explored further to understand exactly why it is a significant predictor. This revelation has provided a great starting point for future studies to explore and expand upon.

6.1 Focus for Future Studies

Therefore, it would benefit the body of knowledge for researchers to obtain an internal review board Health Insurance Portability and Accountability Act approval so that patient health and healthcare needs can be factored into an individual's comfort level in visiting with healthcare professionals in person. Future studies should also consider expanding upon social factors such as an individual's level of education, their political leanings, their trust of science and perspectives on COVID-19 vaccinations. These factors may shape an individuals perceived risk to themselves and others if infected with COVID-19, so perceived risk should also be explored to understand an individuals comfort level. Additionally, future research would benefit from expanding the population size and diversity of people with chronic health conditions to include male participants and a wider variety of chronic health conditions. As previously mentioned, future research would greatly benefit from including expanded economic factors in their studies that may or may not influence an individual's preference of non-emergency healthcare. Research could also benefit from a better understanding of the complexities and American Disabilities Act (ADA) accommodations of telemedicine platforms that respondents are/were utilizing and how they contribute to an individual's preference for telemedicine for non-emergency healthcare. Future research should include qualitative assessments to identify factors that improve the quality of care for those using telemedicine services. When these variables are addressed by future researchers, information can be disseminated to healthcare providers shaping the future of telemedicine and their telemedicine platforms to provide patients with a positive healthcare experience and accessibility for all.

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