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Healthcare Professional Perceptions and Opinions Concerning Telehealth Pre and Post
the COVID-19 Pandemic

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ABSTRACT

PURPOSE: Many scholarly articles and journals published about telehealth discuss patient demographics, the use of virtual visits for chronic conditions, and patient perceptions of virtual care. A plethora of information is available concerning the impact of telehealth on patients' feelings toward this new wave of virtual healthcare, however, the opinions of healthcare providers and administrators are lacking.

The purpose of this study is to better understand how different healthcare providers such as doctors, nurses, and healthcare administrators perceive telehealth before and after the COVID-19 pandemic. A secondary aim is to understand how much providers use telehealth before and after the pandemic and to determine whether the ways in which they use it has changed. Moreover, this study seeks to understand what providers believe is necessary for the sustained growth of telehealth. This study hypothesizes that providers will have incorporated telehealth more into their work post-pandemic (more frequent use and more modalities) and will have relatively positive feelings toward such use. However, we also anticipate that providers will also have many suggestions for improvement. Interview data information will be collected to address the research aims.

METHODS: 13 informational interviews were conducted with healthcare professionals, including nurses, physicians, and administrators. The inclusion criteria that had to be met by all participants including age (that they are 18 years or older), have worked in healthcare for at least one year, and speak English. All 13 participants were found and selected via the Principal Investigator's professional network, as well as through snowball sampling. Once meeting all criteria, participants engaged in a 30-minute informational interview via Zoom on the topic of

telehealth care. The interview consisted of multiple-choice and free-response questions. All multiple-choice questions were analyzed quantitatively, and all open-ended responses were coded qualitatively to produce the study results.

RESULTS: Most of the healthcare professionals in this study define telehealth to include phone calls, video calls, texting/online messaging, and e-mailing. Video calls are the most frequently used in their roles. Pre- COVID-19, most participants had neutral feelings toward telehealth, but after the beginning of the pandemic in 2020, most participants strongly like telehealth care. When analyzing the qualitative component of this study, multiple key themes were identified. One theme was accessibility for both patients and providers, which encompasses convenience, physical access, equity, reimbursement, and insurance issues. Another identified theme was acceptance. Patient and provider buy-in, technology use, and education all fall under this category. Lastly, clinical concerns, which encompasses condition-specific use, lack of physical exams, and delay of diagnosis, were identified as a key theme.

DISCUSSION: The findings of this study show that providers have incorporated telehealth in their care delivery. All participants were overall supportive of telehealth care but had suggestions for improvement. Participants had differing opinions on certain topics relating to telehealth such as their personal experiences, the quality of care received by patients, and equity concerns. The largest strength of this study is the use of both quantitative and qualitative data, while some limitations are the small sample size as well as the lack of diversity in the sample. Future research should be done to study virtual care medical training, care coordination, and equity relating to telehealth care. Lastly, policy concerns about the emergency use of telehealth will need to be monitored as this will greatly affect telehealth.

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Chapter 1

Introduction

Telehealth usage has skyrocketed since the beginning of the COVID-19 pandemic due to the need for social distancing. According to the Centers for Disease Control and Prevention (CDC), 37 percent of adults in the United States used telehealth care in 2021 (Lucas, 2022). However, the future use of these technologies is somewhat unclear, especially as the pandemic wanes and emergency measures are phased out. The patient view of telehealth care is studied often, but providers have not been studied as thoroughly. This mixed-methods study focuses on gaining insights from providers and professionals in the healthcare field via interviews. Answers to multiple-choice, multiple-select, and open-ended questions will be analyzed quantitatively or qualitatively to produce results for this study. The professional insights uncovered by this study will supplement current and future research on the topic of telehealth care.

Literature Review

Topic, Research Question, and Purpose:

The coronavirus plagued the world in early 2020, forcing the already complex and ever-changing field of healthcare into the limelight. In this instance, healthcare changed immediately to cope with the impending pandemic. Virtual healthcare became prominent in everyday life for anyone needing basic medical care due to the necessity of social distancing. Physicians and patients were strongly impacted due to the need for access to the Internet, increased healthcare services, and a feeling of comfort while meeting virtually with a healthcare professional.

This literature review about telehealth care access and comfort levels among different population characteristics is intended to gather a summary of the known knowledge about this evolving topic. As mentioned previously, virtual healthcare is on the rise following the COVID-19 pandemic, so basic knowledge about who can access this type of care, to what extent care can successfully be conducted this way, and whether patients are satisfied with telehealth care is essential among virtual healthcare providers. By asking and answering these questions, healthcare professionals and policymakers can make strides in successfully implementing and growing virtual healthcare

Search Process and Review Methods:

Keywords and phrases were used to discover the most relevant works in searching for scholarly, peer-reviewed journal articles. Examples of these words and phrases include Telehealth care, Virtual Healthcare, Access to Virtual Healthcare, Comfortability with Virtual Healthcare, and Patient Perceptions of Telehealth. Each of these was searched at least once within multiple search engines such as PubMed, Google Scholar, and JSTOR. After preliminary articles that provided valuable information on the topic of telehealth were located, the references of these selected articles were examined to potentially identify more sources. Titles and abstracts of related articles were read and examined to determine the best fit for the aim of the study.

After the initial searches, the review process involved selecting the most relevant articles for this study's research question. This selection process involved narrowing the articles based on keywords found in titles and abstracts. Telehealth articles focusing on rural healthcare, pediatric care, and healthcare ethics were deemed less suitable for further consideration and were dropped. Additionally, articles primarily concerned with chronic conditions and specialty were generally

disregarded because the research question pertains to telehealth usage for primary care. Lastly, the search was guided as pre-COVID literature and post-COVID literature was needed.

Once 12 articles were chosen, they were reviewed thoroughly utilizing information such as publication date, study design, sample type, objective, pre-COVID status, and the study's main results. **Table 1** illustrated this process. Additionally, the PRISMA diagram (**Figure 1**) shows a more detailed description of how sources were chosen for the study and the reason prompting the rejection of a study from the analysis.

Table 1. Literature Review Articles and Key Information

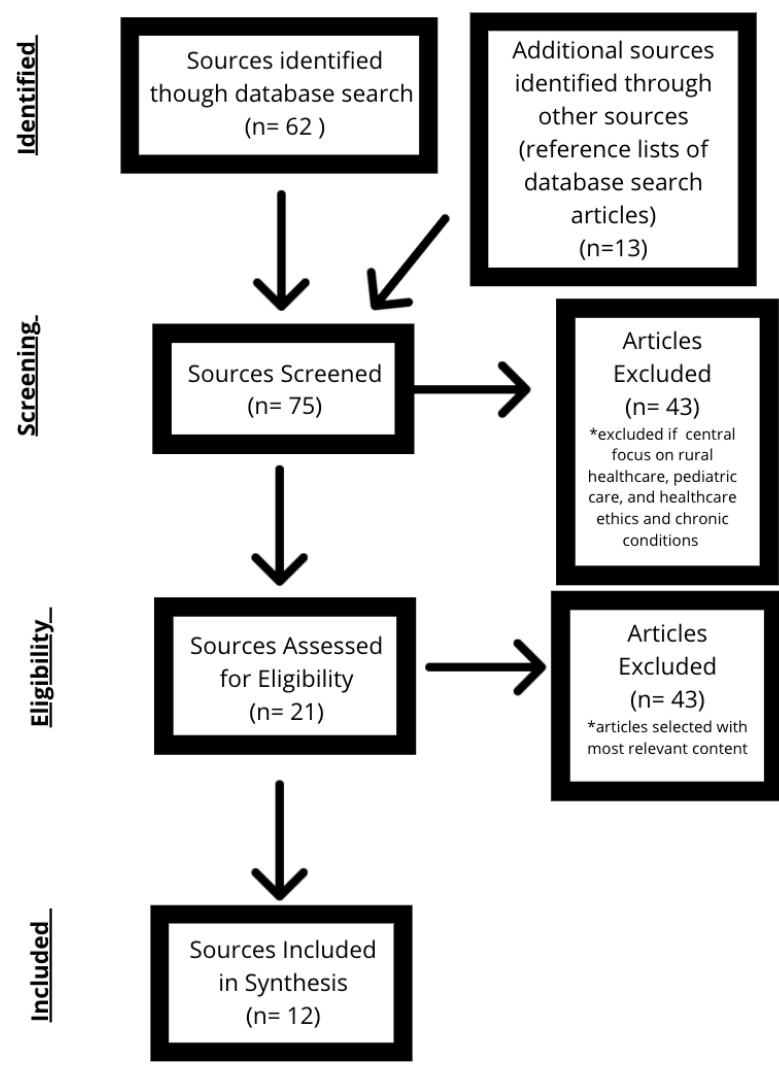
Study	Author(s)	Date of Publication	Study Design	Sample	Objective	Pre-COVID?	Main Results
Patient Characteristics Associated With Telemedicine Access for Primary and Specialty Ambulatory Care During the COVID-19 Pandemic	Eberly, Lauren A. et al.	December 29, 2020	Cohort Study	<ul style="list-style-type: none"> 148,402 patients studied Previously scheduled for primary care and medical specialty ambulatory telemedicine visits Performed at a large academic health system 	Evaluate potential inequities in telemedicine use and video visit use for telemedicine visits during the COVID-19 pandemic	No	<ul style="list-style-type: none"> Older, Asian race, non-English preferred language, and Medicaid insurance were all factors independently correlated with lower telemedicine visit rates. Older, female sex, Black race, Latinx ethnicity, and lower household income were all associated with less video use for telemedicine visits.
The Impact of Telehealth Implementation on Underserved Populations and No-Show Rates by Medical Specialty During the COVID-19 Pandemic.	Franciosi, Ellen B. et al.	August 27, 2021	Cross-Sectional Analysis (2019 versus 2020)	<ul style="list-style-type: none"> 49 specialty clinics examined Total clinic visits: 1,100,000 2020 clinic visits: 46,000 From UMass Memorial Medical Center 	Demonstrate specialty-specific changes in patient demographics among telehealth visits in comparison to clinic visits. Demonstrate that nonsurgical specialties had significantly lower no-show rates and the greatest number of telehealth visits, comparing 2019 clinic visits with 2020 telehealth visits analyze baseline trends in-clinic visits	No	<ul style="list-style-type: none"> Fewer non-English-speaking patients utilized telehealth compared to in-person clinic visits across all specialties Mean age of telehealth users was higher in 2020 than in 2019 in all groups except primary care Televisits improve access to care (for non-procedures) Televisits produce lower no-show rates for visits (except surgical specialties)
Patient Perceptions of Telehealth Primary Care Video Visits	Powell, Rhea E. et al.	May 15, 2017	Semi-structured Qualitative Interviews Content Analysis Approach	<ul style="list-style-type: none"> Patients 18+ After video visits with primary care clinicians n = 32 patients (19 successfully interviewed) 	Describe patient experiences with video visits performed with established primary care clinicians	Yes	<ul style="list-style-type: none"> Pros: Convenience, decreased cost, comfortability (safe space) Cons: Privacy (over-hearing conversations), possible inability to perform adequate physical exams

Patient preferences for direct-to-consumer telemedicine services: a nationwide survey	Welch, Brandon M. et al.	November 28, 2017	Survey	<ul style="list-style-type: none"> n = 4345 demographically balanced adults in the U.S. 	Understand patient preferences and desires for Direct-to-Consumer (DTC) telemedicine	Yes	<ul style="list-style-type: none"> 3.5% had even had an online visit 52% willing versus 25% unwilling to see their own provider via a virtual visit 56% believe it is important to have a relationship with the provider prior to televisit 60% felt it is important for the provider to have access to patient's health records <p>Overall: Patients prefer telemedicine usage when done with their own physician</p>
Patient satisfaction with physician-patient communication during telemedicine	Agha, Z., Schapira, R. M., Laud, P. W., McNutt, G., & Roter, D. L.	November 15, 2009	Noninferiority randomized clinical trial (RCT) Self-report questionnaire	<ul style="list-style-type: none"> n=221 patients 18+ years from a tertiary care facility (veterans) The population was almost entirely male 	Determine if physical separation and technology used during telemedicine (TM) visits have a negative effect on physician-patient communication	Yes	<ul style="list-style-type: none"> TM did not negatively affect physicians' interpersonal skills Some patients reported feeling less comfortable disclosing sensitive information during TM visits Some felt that "personal attention" from physicians was absent Patients prefer TM if they can avoid travel
Access and Quality of Care in Direct-to-Consumer Telemedicine	Uscher-Pines, L., Mulcahy, A., Cowling, D., Hunter, G., Burns, R., & Mehrotra, A.	April 1, 2016	Geographic information system analyses	<ul style="list-style-type: none"> Between the ages of 18 and 64 Continuously enrolled in the CalPERS health maintenance organization plan Two groups: Teladoc users (n = 3,043) and nonusers (n = 230,872) 	<p>Compared the quality of care of Teladoc (Direct-To-Consumer) with in-person physician offices</p> <p>Compared access to care for Teladoc users and nonusers</p>	Yes	<ul style="list-style-type: none"> Teladoc performed worse than physician offices in quality of care (16.7% versus 27.9%) Teladoc providers were less likely to order diagnostic testing Teladoc providers had poorer performance on appropriate antibiotic prescribing for bronchitis Teladoc users were not preferentially located in underserved communities, healthcare shortage areas, or rural areas
Public perceptions and disparities in access to telehealth orthopaedic services in the COVID-19 era	Puzzitiello, R. N., Moverman, M. A., Pagani, N. R., Ryan, S. P., Salzler, M. J., Jawa, A., & Menendez, M. E.	August 2021	Telemedicine Satisfaction and Usefulness Questionnaire Multivariable (modified version) Logistic regression modelling	<ul style="list-style-type: none"> n = 816 participants (obtained from crowdsourcing) 	Identify components of telehealth that patients find difficult or struggle with during the coronavirus pandemic based on patients' demographics	No	<ul style="list-style-type: none"> 85% agreed telehealth is convenient 64% preferred telehealth to in-person visits 81% of participants feel more comfortable using telehealth for follow-up care rather than the 59% who felt comfortable using it for initial assessments Lower income and poor health were indicators of difficulty with navigating telehealth technology
Designing a web-based telehealth system for elderly people: An interview study in New Zealand	Dhillon, Jaspaljeet Singh et al.	June 2011	Semi-structured interviews (45-60 minutes) Qualitative content analysis	<ul style="list-style-type: none"> n = 8 participants (age between 60 to 87) 	Determine what is required to successfully run a telehealth system (Utilized Web 2.0 technology)	Yes	<ul style="list-style-type: none"> 6/8 participants reported using the web to search for information related to their health Of the 6 individuals, none trusted the information they found on the web completely Most discussed their Internet health findings with their physicians
Perceptions of	Gardner,	April 1,	Phone survey	<ul style="list-style-type: none"> n = 500 total 	Understand patient	Yes	<ul style="list-style-type: none"> 57% reported the technology

video-based appointments from the patient's home: a patient survey	M. R., Jenkins, S. M., O'Neil, D. A., Wood, D. L., Spurrier, B. R., & Pruthi, S.	2015	(random patients in sample) (Stratified based on proximity to the local institution)	<p>patients, 301 patients responded, and 263 met the inclusion criteria</p> <ul style="list-style-type: none"> No limits based on age, geography, or medical condition (except all patients 18+) All patients had received outpatient care 	<p>perceptions of an in-home video appointment as a particular service offering on a prospective basis</p> <p>Understand general potential uptake across healthcare service lines.</p>		<p>they own would support a video call</p> <ul style="list-style-type: none"> 38% felt comfortable setting up a video call 62% agreed they could get the same level of care from a virtual visit (of people who had engaged in a virtual visit) 34% agreed they could get the same level of care from a virtual visit (people who had NOT experienced a virtual visit) 3 factors for engaging in a virtual visit: <ul style="list-style-type: none"> comfort in setting up a video call age distance from a medical facility The mean age is 55.4 for those willing to complete video visits
Telehealth utilization during the Covid-19 pandemic: A systematic review	Garfan, S., Alamoodi, A. H., Zaidan, B. B., Al-Zobbi, M., Hamid, R. A., Alwan, J. K., ... & Momani, F.	November 2021	Systematic review	<p>Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA)</p> <p>ScienceDirect, IEEE Xplore, Scopus, Web of Science, and Springer digital databases were utilized to find articles and information for the review</p>	<p>Examine challenges that negatively affect the growth and utilization of telehealth in the COVID-19 era and suggest ways to overcome these challenges</p>	No	<ul style="list-style-type: none"> Telehealth services were a positive experience for patients Telehealth services could be broadly used after the pandemic What Telehealth is missing: <ul style="list-style-type: none"> Rules and regulations for utilizing telehealth Data privacy and security Systems integration Infrastructure Post COVID-19 path for telehealth
Disparities in use of telehealth at the onset of the COVID-19 public health emergency. <i>Journal of Telemedicine and Telecare</i>	Pierce, R. P., & Stevermer, J. J.	October 21, 2020	Cross-sectional retrospective analysis	<p>3938 face-to-face encounters and 3804 (49.1%) telehealth encounters. Of the telehealth encounters, 2937 (37.9%) were full audio-video and 867 (11.2%) were audio-only.</p>	<p>Compare demographics of individuals utilizing telehealth during the Public Health Emergency (PHE) to those with face-to-face visits during the same time period</p> <p>Compare the demographics of the individuals using full audio-video into those using audio-only during telehealth visits</p>	No	<ul style="list-style-type: none"> Women, older patients, Medicare and Medicaid recipients, and people paying out of pocket used telehealth visits more often Non-White individuals and individuals from rural areas used telehealth less Younger patients and patients from rural areas were more likely to use audio-video visits (For those using telehealth) Older individuals, Black individuals, Medicaid and Medicare recipients, and out-of-pocket spenders used phone-only visits more frequently During COVID-19, telehealth expansion resulted in increased age of participants using telehealth Individuals in rural areas were less likely to use telehealth (if used, more likely to use audio and video)
Disconnected: a survey of users and nonusers of telehealth and their use of primary care	Liaw, W. R., Jetty, A., Coffman, M., Petterson, S., Moore, M. A., Sridhar, G., ... &	March 13, 2019	Cross-sectional survey	<ul style="list-style-type: none"> n = 766 Adults (18+) with telehealth services access (visited healthcare providers for any of the 20 most-commonly seen diagnoses during telehealth visits) 	<p>Utilize patient perceptions to assess awareness, perceptions, and value of telehealth in primary care</p>	Yes	<ul style="list-style-type: none"> Registered Users (RUs) of telehealth were least likely to have a primary care usual source of care than registered non-users (RNUs) and non-registered non-users (NRNUs) Nearly half (46.8%) of RUs were unable to make an appointment with their physician

Bazemore, A. W.						<ul style="list-style-type: none"> • 34.8% of RU's physician's offices were closed • RUs were most likely to be employed, have post-high school education, and live in urban areas • RUs were less likely to have a primary Usual Source of Care (USC), <ul style="list-style-type: none"> ◦ access > continuity • Visits were often on weekends and holidays • Convenience of telehealth attracts users • Telehealth services need to share information with primary care and vice versa
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Figure 1. PRISMA Diagram



Literature Synthesis:

Demographics for Telehealth Use:

Telehealth has been present in healthcare for many years prior to the COVID-19 pandemic and disparities in its usage have been present as well. Providers need to understand who makes up the patient population that they will be serving via telehealth. Differences in the patient population might affect how providers will use and view healthcare technology. Through a synthesis of the literature, common trends were identified in age, race, ethnicity, income, and residency area type. Eberly et al. (2020) and Gardner et al. (2015) note that older age is positively correlated with lower telehealth usage. Both studies were completed using data prior to the coronavirus pandemic. Pierce (2020), focusing more on the impact of the pandemic, found that surges in COVID-19 were seen, along with the increased age of telehealth participants. Franciosi et al. (2021) highlighted in a cross-sectional analysis of demographics in telehealth from 2019 and 2020 that the mean age of telehealth users increased in 2020 in all forms of care excluding primary care. The age of patients is an essential factor to consider due to the greatly differing needs of these patients and their ability to interact electronically. Pediatric doctors may struggle to utilize telehealth since young children cannot adequately vocalize their medical issues. Additionally, the elderly population could have trouble with speaking and hearing a physician over the phone or on a video visit (Dhillon, 2011).

In addition to age as a factor in telehealth use, race, ethnicity, location, and socio-economic status were also found to have an impact on telehealth usage (Liaw et al., 2019). Furthermore, Liaw et al. (2019) found that registered users of telehealth services were more likely to be employed, have education beyond high school, and reside in urban areas. These findings are indirectly supported by other works such as Eberly et al. (2020), whose study demonstrated that

lower income households were less likely to utilize telehealth services. Healthcare disparities need to be recognized and addressed so that the highest number of patients can receive the care they need. Providers need to understand the discrepancies in care that often exist among different patient populations so that they can ensure they are providing the most equitable care possible.

Accessibility to Virtual Care and Outcomes:

Patient perceptions, outcomes, and ways to improve virtual health cannot be analyzed unless patients can access this care. All the demographic factors discussed previously are deeply intertwined with access to telehealth. Puzzitiello (2021) found that both lower income and poorer health status were related to difficulty navigating and successfully using telehealth services. Dimensions of access are an issue in terms of Internet accessibility and availability of video services, as well as the willingness of patients to participate. A 2017 study of 4,345 patients found that 52% of the sample was willing to see their physicians via an Internet platform (Welch, 2017). This study generally concluded that patients prefer telemedicine when it is conducted with their own physician with whom they have a previous relationship.

Once accessibility of virtual healthcare is achieved, the facilitation and outcomes of the care given need to be addressed. A Randomized Controlled Trial (RCT) found that telemedicine visits did not have an impact on the interpersonal skills of the physician conducting the visit (Agha, 2009). While interpersonal factors were not affected, Uscher-Pines and colleagues (2016) reported that Teladoc, a direct-to-consumer telehealth system, had worse outcomes than in-person visits. Overall, the quality of care was worse, fewer diagnostic tests were performed, and prescribing methods for bronchitis were more likely to be inappropriate (Uscher-Pines, et al. 2016). These studies call into question the quality of care being received by those who utilize

telehealth and can point toward areas needing improvement within the system. Because of the many unknowns about the quality of telehealth care, providers' opinions and experiences need to be studied to better understand how quality care can be administered in virtual settings. Providers may have a sense of what types of care are the most beneficial or, conversely, which are not effective using telehealth.

Patients' Perceptions of Virtual Care:

Multiple studies in the literature review found that the convenience of telehealth compared to in-person visits is appealing to patients. For example, a study of 816 participants in 2021 found that 85% of participants felt that telehealth is a more convenient method of care (Puzzitiello, 2021). Additionally, a random phone survey in 2015 discovered that out of 263 participants, 62% of the sample participants who had engaged in a virtual visit felt that they could receive the same level of care virtually (Gardner, 2015). A common trend throughout the literature was assessing patients' weighted preferences for convenience versus privacy and security of the patient's private information. These results imply that patients will want to keep the expanded access to telehealth afforded to them by the pandemic.

While the convenience of virtual healthcare is desirable to patients, many concerns need to be addressed for increased participation. In a semi-structured, qualitative interview of 19 patients, Powell and colleagues (2017) found that the primary concerns with video visits are the privacy of conversations and the inability to perform a physical examination. Similar to Powell, Agha (2009) also found that some patients felt uncomfortable sharing certain information during virtual visits due to privacy concerns. Based on these studies, ensuring privacy, security of information, and positive patient-physician interactions may accelerate the acceptance and

growth of virtual healthcare. Of course, these studies only looked at convenience and availability from the perspective of patients.

Gaps in the Literature and Opportunities for Future Research:

Many scholarly articles and journals published about telehealth discuss patient demographics, the use of virtual visits for chronic conditions, and patient perceptions of virtual care. There is a gap in the literature with respect to providers. A plethora of information is available concerning the impact of telehealth on patients' feelings toward this new wave of healthcare, but the opinions of healthcare professionals and administrators are lacking. Their input is essential for the future development and implementation of these services because providers and health systems oversee and drive the providing of these services. Furthermore, relatively little work has been done to examine what types of illnesses and medical concerns are most suitable for telehealth care. Varied research is available on outcomes and virtual visit usage for specific conditions, but further exploration and analysis of these possibilities will prompt future research and guide telehealth system adaption.

Conclusions:

Telehealth care will continue to grow and will likely become more prominent as technology advances, resulting in a need for researchers to understand important aspects such as access, patient opinions, and provider perceptions. By having a solid base of knowledge and research about virtual care, healthcare administrators, providers, other health professionals, and policymakers can work to make these systems as effective as possible to improve the overall U.S. healthcare system.

A key finding of the review are that while the older population has previously utilized telehealth less than other age groups, the COVID-19 pandemic is encouraging telehealth usage for this group. Low income, rural residency, and a non-English as the preferred language are the most prominent disparities in this field. Regarding the limitations to patient access, approximately half of the participants mentioned in this study are willing to use telehealth. Reluctancy is likely due to factors such as privacy concerns, security of information, and fear of poorer health outcomes due to the virtual nature of the care. The health outcomes of telehealth care need further research, especially after the large increase in telehealth utilization since the start of the coronavirus pandemic.

Further research should gain insight into providers' opinions and goals for telehealth since provider knowledge is essential to adopting and using these systems efficiently. Additionally, gathering insight from patients in addition to providers about how the systems could be made more palatable and user-friendly is essential. More information on usability will better guide leaders and technologists in the field to produce better systems that providers and patients can access and feel comfortable using while achieving quality health outcomes.

Chapter 2

Methods

Introduction

This mixed methods study, which focuses on telehealth, looks at both qualitative and quantitative measures. The synthesis of the literature, which is detailed in the literature review section above, demonstrated that the provider perspective on telehealth was lacking, especially since the start of the COVID-19 pandemic. A study using closed-ended and open-ended questions in interviews will provide the needed context for these issues. This study (Study 00021152) was approved by the Penn State Institutional Review Board (IRB).

Interview Question Formulation

The next step in the study design process involved creating interview questions that included quantitative and qualitative components. In formulating the questions for the study, the Principal Investigator (PI) created questions based on information gaps noted from the literature review. The demographics questions were based on the National Health Interview Survey (NHIS) created by the Centers for Disease Control and Prevention (National Center for Health Statistics, 2019). All other questions were created by the PI and edited by the PI's advisor for clarity. All questions were aimed at gaining well-rounded answers and opinions from each participant.

Study Formulation

After creating the survey, study participants were acquired through personal contacts and snowball sampling. The PI sent and responded to all e-mails asking participants about their

willingness to participate in the study. The goal was to find at least 10 individuals who met the following inclusion criteria (*Note: 13 participants were ultimately interviewed*):

Table 2. *Participant Inclusion Criteria*

Age 18 years or older
Working professionally in healthcare for at least one (1) year
Speaks English

Participants were contacted via e-mail to schedule informational interviews with the PI via the Zoom platform. On the day and time of the scheduled interview, both the PI and the participant entered the Zoom video conference room. The PI asked the participant questions to ensure the participant fit into the inclusion criteria, as well as to receive informed consent and share the following information with the participant:

- “First, please confirm that you are over the age of 18 and have worked as a healthcare professional for more than one year.
 - If the response is “yes”, continue
- In this interview, I will be trying to get a better understanding of your experiences and opinions surrounding telehealth usage in healthcare. The formal interview will commence momentarily.
- Do you consent to participate in this study?
 - If the response is “yes”, continue.
- Do I have your consent to record this interview?
 - If the response is “yes”, continue.
- I want to ask you to turn off your camera and I will turn off mine so that solely the audio will be recorded for later transcription so that you will be understood and quoted accurately.

- I want to also let you know that your name and place of work will not be linked to your answers in any way throughout the study.
- If you are ready, I am going to start the recording and begin the interview.

The following figure, Figure 2, displays the 22 questions that were asked to study participants during the 30-minute interview time. All questions with answer choices below are multiple-choice (question #7 is a multiple-select) and all other questions are open-ended. Probing questions were asked throughout each interview to gain the clearest picture possible of the participant's opinions and ideas.

Figure 2. Standard Interview Questions

Interview Questions
<p>1. How long have you been in your current job? <i>Mark only one oval.</i></p> <ul style="list-style-type: none"> <input type="radio"/> Less than one year <input type="radio"/> 1-5 years <input type="radio"/> 6-10 years <input type="radio"/> 11-15 years <input type="radio"/> 16+ years
<p>2. How long have you worked in healthcare? <i>Mark only one oval.</i></p> <ul style="list-style-type: none"> <input type="radio"/> Less than one year <input type="radio"/> 1-5 years <input type="radio"/> 6-10 years <input type="radio"/> 11-15 years <input type="radio"/> 16+ years
<p>3. What do you practice in? (Position Description)</p>
<p>4. Do you currently describe yourself as male, female, or transgender? <i>Mark only one oval.</i></p> <ul style="list-style-type: none"> <input type="radio"/> Male <input type="radio"/> Female <input type="radio"/> Transgender <input type="radio"/> None of these <input type="radio"/> Refused <input type="radio"/> Don't know
<p>5. Are you Latino or Hispanic? <i>Mark only one oval.</i></p> <ul style="list-style-type: none"> <input type="radio"/> Yes

<ul style="list-style-type: none"> <input type="radio"/> No <input type="radio"/> Refused <input type="radio"/> Don't know
<p>6. Which of the following best describes your race/ethnicity?</p> <p><i>Mark only one oval.</i></p> <ul style="list-style-type: none"> <input type="radio"/> White <input type="radio"/> Black or African American <input type="radio"/> Asian <input type="radio"/> American Indian or Alaska Native <input type="radio"/> Native Hawaiian <input type="radio"/> Refused <input type="radio"/> Don't know
<p>7. How would you define telehealth?</p> <p><i>Select all that apply.</i></p> <ul style="list-style-type: none"> <input type="radio"/> Phone calls <input type="radio"/> Video calls <input type="radio"/> Texting/Online Messaging <input type="radio"/> E-mailing <input type="radio"/> Other: _____
<p>8. What forms of telehealth (phone call, video call, e-mail, etc.) were you using most often prior to the COVID-19 pandemic in early 2020?</p> <p><i>Mark only one oval.</i></p> <ul style="list-style-type: none"> <input type="radio"/> Phone calls <input type="radio"/> Video calls <input type="radio"/> Texting/Online Messaging <input type="radio"/> E-mailing <input type="radio"/> Other: _____
<p>9. What forms of telehealth (phone call, video call, e-mail, etc.) are you using most often now?</p> <p><i>Mark only one oval.</i></p> <ul style="list-style-type: none"> <input type="radio"/> Phone calls <input type="radio"/> Video calls <input type="radio"/> Texting/Online Messaging <input type="radio"/> E-mailing <input type="radio"/> Other: _____
<p>10. Prior to the beginning of the COVID-19 pandemic in early 2020, how often were you using telehealth in your daily life as a provider?</p> <p><i>Mark only one oval.</i></p> <ul style="list-style-type: none"> <input type="radio"/> Never <input type="radio"/> Occasionally <input type="radio"/> Sometimes <input type="radio"/> Often (at least once a week) <input type="radio"/> Always (many times a week)
<p>11. Currently in your position, do you use telehealth less often, the same amount, or more often than prior to the COVID-19 pandemic?</p> <p><i>Mark only one oval.</i></p> <ul style="list-style-type: none"> <input type="radio"/> Less

<ul style="list-style-type: none"> ○ Same ○ More ○ Not Sure
<p>12. How did you feel about telehealth prior to the COVID-19 pandemic in relation to your work? <i>Mark only one oval.</i></p> <ul style="list-style-type: none"> ○ Strongly Disliked ○ Disliked ○ Neutral ○ Liked ○ Strongly Liked
<p>13. How do you currently feel about telehealth in relation to your work? <i>Mark only one oval.</i></p> <ul style="list-style-type: none"> ○ Strongly Disliked ○ Disliked ○ Neutral ○ Liked ○ Strongly Liked
<p>14. How do you feel about the quality of patient care of telehealth as compared to face-to-face healthcare?</p>
<p>15. During the COVID-19 pandemic, did you experience change in your job responsibilities? <i>Mark only one oval.</i></p> <ul style="list-style-type: none"> ○ Yes ○ No ○ Not Sure
<p>16. If yes, you did experience change in your job responsibilities during the COVID-19 pandemic, please explain these changes.</p>
<p>17. When using telehealth, did you see change in patient's experience? If yes, please explain.</p>
<p>18. Based on your experience, how have patients responded to telehealth care? <i>Mark only one oval.</i></p> <ul style="list-style-type: none"> ○ Very Well ○ Well ○ Not Well ○ Not Well at all ○ Refused
<p>19. Do you believe anything can be done to make telehealth easier to use for patients? If yes, please explain.</p>
<p>20. How do you feel about the growth of telehealth care? <i>Mark only one oval.</i></p> <ul style="list-style-type: none"> ○ Strongly Support ○ Support ○ Neutral ○ Do Not Support ○ Strongly Do Not Support
<p>21. What do you believe are the most important issues in telehealth moving forward?</p>
<p>22. Please include any final comments you may have about the topic of telehealth care.</p>

Quantitative Data Analysis

Before the commencement of interviews, a Google form was created for all multiple-choice and multiple-select questions. This form was linked to an Excel worksheet, where all the answers would be organized. Throughout the interviewing process, the PI completed the form by recording and transcribing all closed-ended answers from each participant.

Once interviews were completed and all the responses had been organized in an Excel worksheet, each question and the coinciding responses were inserted into pivot tables.

Customizable tables were then created using this Excel functionality, which displayed the question asked, the answer choices, and a count for how many times each answer was selected.

These tables were then converted into one larger table in Word based on the content of the question. For example, demographic questions were grouped and then inserted into a Word table format in this final thesis document. The most pertinent information for the study, such as telehealth usage prior to the COVID-19 pandemic as compared to after the pandemic, is also presented graphically.

Qualitative Data Analysis

Each interview was recorded via Kaltura, a recording platform that is paired with Zoom and provides audio transcripts for each recorded Zoom meeting. After each interview, the transcripts were copied from Kaltura and pasted into a formal document, where the PI corrected any translation mistakes from the Kaltura program. At the end of the entire interviewing process, the PI consolidated all transcripts by participant.

Additionally, separate documents were created for each question and each participant's answer was listed for the designated question. From these question documents, each line of answers to

the open-ended questions was reviewed and a word or phrase that summarized the meaning of the sentence was created and documented. Notably, only lines with pertinent information were coded. For example, a participant's information about the participant's job not relating to telehealth was not coded. Once this was complete for all important lines of dialogue, these words and phrases were grouped into meaningful categories. An example of this is multiple participants mentioning that physician embracement, nurse buy-in, and the support of the overarching healthcare institution are needed to move telehealth care forward. Any quotes mentioning ideas such as these would be grouped under the category of convenience.

Each category was analyzed, and a table was created indicating what number and percentage of participants mentioned that categorized topic. Below each table specific quotations and explanation for categories are provided.

Chapter 3

Results

Quantitative Results

The following results, shown in Tables 2 and 3 below, were collected through multiple choice and multiple select questions asked to the participants.

Table 3. Participant Demographic Responses (N = 13)

Variable	Percentage of Respondents	Count
How long have you worked in healthcare?		
Less than 1 year	0%	0
1 – 5 years	0%	0
6 – 10 years	15.4%	2
11 – 15 years	15.4%	2
16+ years	69.2%	9
How long have you worked in your current job?		
Less than 1 year	23.1%	3
1 – 5 years	30.8%	4
6 – 10 years	15.4%	2
11 – 15 years	0%	0
16+ years	30.8%	4
Do you currently describe yourself as male, female, or transgender?		
Male	30.8	4
Female	69.2	9
Transgender	0%	0
None of these	0%	0
Refused	0%	0
Does not know	0%	0
Are you Latino or Hispanic?		
Yes	0%	0
No	92.3%	12
Refused	7.7%	1
Does not know	0%	0
Which of the following describes your race/ethnicity the best?		
White	76.9%	10

Black or African American	7.7%	1
Asian	7.7%	1
American Indian or Alaska Native	0%	0
Native Hawaiian	0%	0
Refused	7.7%	1
Does not know	0%	0

The demographic data displayed in Table 3 shows that all of the participants in this study have worked in healthcare for more than six years and a large majority have worked in healthcare for more than 16 years. These individuals have extensive experience in the field of healthcare.

Moreover, most participants are female and White, which should be considered when formulating future studies as a greater diversity among participants would likely provide a wider breadth of information.

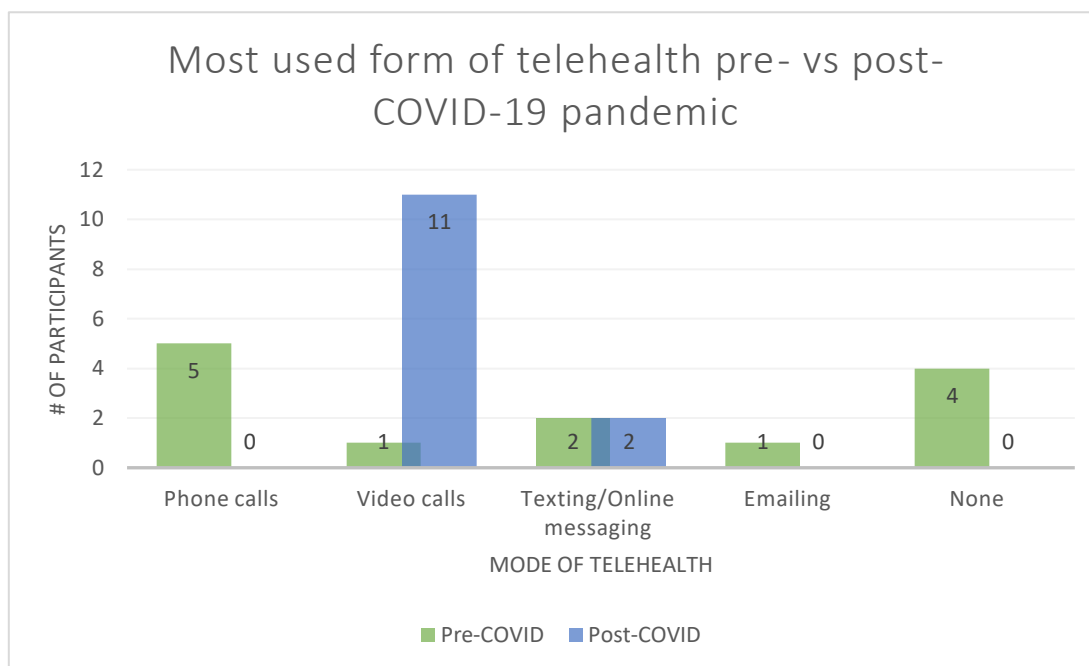
Table 4. Telehealth Closed-Ended Question Responses (N =13)

Variable	Percentage of Respondents	Count
How would you define telehealth? (Select all that apply)		
Phone calls	0%	0
Video calls	7.7%	1
Texting/Online messaging	0%	
E-mailing	0%	0
Other	0%	0
Phone calls and Video calls	15.4%	2
Phone calls, Video calls, and Texting/Online messaging	7.7%	1
Phone calls, Video calls, Texting/Online messaging, and E-mailing (All of the above)	69.2%	9
What forms of telehealth (phone calls, video calls,		

texting/online messaging, e-mailing, or other) were you using most often prior to the COVID-19 Pandemic? *		
Phone calls	38.5%	5
Video calls	7.7%	1
Texting/Online messaging	15.4%	2
E-mailing	7.7%	1
None	30.8%	4
What forms of telehealth (phone calls, video calls, texting/online messaging, e-mailing, or other) are you using most often now?		
Phone calls	0%	0
Video calls	84.6%	11
Texting/Online messaging	15.4%	2
E-mailing	0%	0
None	0%	0
Prior to the beginning of the COVID-19 pandemic in early 2020, how often were you using telehealth in your daily life as a provider?		
Never	61.5%	8
Occasionally	15.4%	2
Sometimes	0%	0
Often (at least once a week)	7.7%	1
Always (many times a week)	15.4%	2
Currently in your position, do you use telehealth less often, the same amount, or more often than prior to the COVID-19 pandemic?		
Less	0%	0
Same	7.7%	1
More	92.3%	12
Not sure	0%	0
How did you feel about telehealth prior to the		

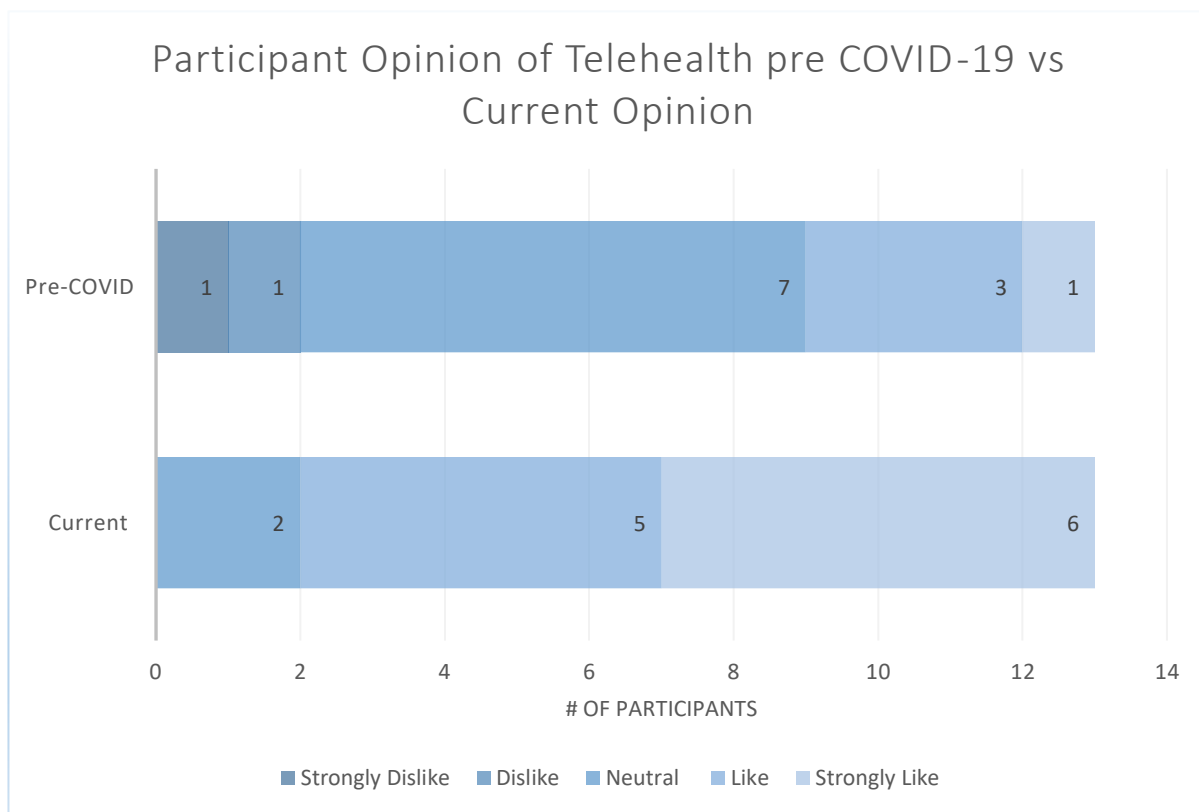
COVID-19 pandemic in relation to your work?		
Strongly Disliked	7.7%	1
Disliked	7.7%	1
Neutral	53.8%	7
Liked	23.1%	3
Strongly Liked	7.7%	1
How do you currently feel about telehealth in relation to your work?		
Strongly Dislike	0%	0
Dislike	0%	0
Neutral	15.4%	2
Like	38.5%	5
Strongly Like	46.2%	6
During the COVID-19 pandemic, did you experience change in your job responsibilities?		
Yes	100%	13
No	0%	0
Not sure	0%	0
Based on your experience, how have patients responded to telehealth care?		
Very Well	38.5%	5
Well	61.5%	8
Not Well	0%	0
Not Well at all	0%	0
Refused	0%	0
How do you feel about the growth of telehealth care?		
Strongly support	76.9%	10
Support	23.1%	3
Neutral	0%	0
Do not support	0%	0
Strongly do not support	0%	0

Figure 3. Most used form of telehealth pre- vs post-COVID-19 pandemic



As displayed in Figure 2, the type of telehealth care utilized by professionals in the field has dramatically changed since the beginning of the COVID-19 pandemic. Before the pandemic, roughly 31% of participants were not using any form of telehealth as compared to about 85% usage currently. This further demonstrates the importance of this study since so many providers only began using telehealth, more specifically video calls, in 2020 and after due to both the pandemic and the Emergency Use Authorization for telehealth. In regard to Figure 3, roughly 69% of participants defined telehealth as all the modes listed in the figure (i.e., phone calls, video calls, texting/online messaging, and emailing). On the other hand, 8% defined telehealth as only video calls, 15% defined it as both phone calls and video calls, and 8% believed telehealth encompasses phone calls, video calls, and texting/online messaging.

Figure 4. Participant Opinion of Telehealth Pre COVID-19 vs Current Opinion



Prior to the COVID-19 pandemic, the healthcare professionals in this study had a neutral opinion about telehealth care. However, the results indicate that most participants' opinions about telehealth have improved since the pandemic. Roughly 62% of participants did not use any form of telehealth before the pandemic, which may indicate why they felt neutral about the technology. Moreover, 100% of participants indicated that their job responsibilities or even their job in its entirety changed during the pandemic, which may also have contributed to changes in their opinions of telehealth.

Overall, the results summarized in Figures 2 and 3 indicate that providers have shifted toward using more telehealth platforms, specifically video and texting/online messaging and that they are enjoying the experience. As shown in Table 3, all participants believe that patients have

responded well or very well to telehealth care and all the same participants support or strongly support the growth of telehealth care. The next chapter will share the qualitative results of the study, which will provide better insight into the opinions of these study participants.

Qualitative Results

The following section displays the results of open-ended questions asked to all participants. First, it is important to understand that the individuals interviewed in this study work with telehealth in different ways. Table 5 provides a breakdown of the current roles of the participants:

Table 5. Participant Position Categorization

Type of Position	Percentage of Participants	Count of Participants
General Management	30.8%	4
Virtual Care Management	38.5%	5
Clinician (Non-Managerial)	30.8%	4

Beyond the broader categories that participants have been grouped into in Table 5, there was substantial variety in the ways in which these individuals engage with telehealth. Some of the job descriptions of participants classified under General Management are Critical Care Division Chief, Clinical Case Manager, Senior Project Manager for the Division of General Internal Medicine, and the Director of Enterprise Clinical Services for Occupational Health. Individuals with titles such as Supervisor of Virtual Care Nursing, Director of Virtual Care Operations, and Medical Director of the Virtual Intensive Care Unit are all classified under Virtual Care Management. Lastly, for the purposes of this study, clinicians refer to participants with titles such as Family Doctor, Primary Care Physicians, and Telehealth Nurse. Individuals under the general management and virtual care management categories very likely are also clinicians, but these grouping are based on the current position description given by each participant.

Participants also described using different modes of telehealth in their work. For example, some individuals mentioned their experiences with inpatient telehealth. These individuals have worked with technology including iPads and cameras in intensive care unit rooms to care for patients. Other participants have provided telehealth care from their own homes to patients in many different settings.

Table 6. Telehealth Care Quality versus Face-to-Face Healthcare?

**Note: Participants were free to express many opinions, so the percentages in this table will not sum to 100%*

Answer Groupings	Percentage of Participants	Count of Participants
Positives		
Convenience	30.8%	4
Increased Attention to Patients	15.4%	2
Better Access for Patients	15.4%	2
Fewer No-Shows	15.4%	2
Negatives		
Not Useful for Some Conditions	53.8%	7
Lack of Physical Examination	23.1%	3

Positives of Telehealth Quality: Convenience, Better Access for Patients, Fewer No-Shows, and Increased Attention to Patients

When discussing the quality of telehealth care, many professionals in the field highlighted provider convenience as well as patient convenience. As discussed in the literature review, convenience was also highlighted by patients as a key reason for accepting telehealth (Puzzitiello, 2021). Multiple participants mentioned the convenience of patients not having to

leave their homes, not needing a form of transportation, and shorter wait times for virtual visits. The transportation problems that can be negated by telehealth also play a large role in access to care for patients. Over time, one can expect that this increase in access to services, specifically for acute illnesses, can help the United States healthcare system in the long run as patients will be able to catch disease and illness in earlier stages and be able to better manage their conditions.

“[Telehealth] saves a lot of money and a lot of time, both for the patient, as well as the provider” (Participant 1).

This quotation highlights the time-effectiveness of virtual care due to barriers such as transportation, cleansing of exam rooms, and filling out paperwork, which was also explained by Participant 1. Moreover, the productivity aspect of telehealth includes can also be due to the ability to see more patients in a day, as well as use of fewer medical supplies due to the lack of physical examinations as mentioned by Participant 1.

“I find that patients are more often, especially for follow-up style appointments, to show up at a telehealth or virtual visit than in the past”
(Participant 8).

Two participants highlighted how they have experienced fewer no-shows for appointments since increasing telehealth usage in their practices. Participants who mentioned a decrease in no-show patients attributed it to the ease and convenience of logging on to a visit as compared to scheduling an appointment in advance, traveling to a medical facility, sitting in a waiting room, and other non-productive time.

Beyond the convenience of telehealth care for booking and attending an appointment, two participants shared their belief that when engaging with patients via telehealth, paying full attention to that individual is easier. From an inpatient provider perspective, one participant commented that:

“It was kind of nice to be remote because I was able to access more resources and do things in a way that I wouldn’t have been able to do if I was directly at the bedside” (Participant 10).

This individual pointed out that so many resources are available at a telehealth care providers’ fingertip, so the provider does not have to step away from the patient, but rather can have a continuous back and forth conversation. As mentioned by another participant, certain questions such as fall risk questions are not needed due to the virtual nature of the interaction, which saves time and allows providers to be more engaged with the current concerns of the patient.

Negatives of Telehealth: Not Useful for Some Conditions and Lack of Physical Examination

While the previous sub-section discussed the many positives of using telehealth care from a healthcare professional perspective, 53.8% of study participants stated that telehealth care can be useful for some conditions but not useful for others. Certain studies are currently focused on determining which types of patients can be seen virtually and who should be seen in person. One article published by the UCLA Health System asked physicians what situations they believed were appropriate for a virtual care setting (Machalinski, 2020). When providers discuss primary care telehealth, the situations mentioned were medication management follow-ups, chronic

disease, and were appropriate for a virtual care setting (Machalinski, 2020). When providers discuss primary care, the situations mentioned were medication management follow-ups, chronic disease planning, mild COVID-19 symptoms, and new patient intake if high risk for COVID-19 (Machalinski, 2020). Beyond these conditions listed in the Machalinski article, participants in this study also mentioned the lack of studies done for inpatient telehealth services as compared to outpatient services.

“[Telehealth] Would not be my first choice for seeing a patient for the first time, but it would certainly be better than not seeing them” (Participant 8).

This participant highlighted a point brought to light by the Machalinski article. The sentiment expressed in this quotation is that be a safe balance between virtual care and in-person care is needed.

Multiple participants mentioned that they believe the quality of telehealth care can sometimes be inferior to in-person care simply because a physical examination is not performed. Observing patients via a video platform is very different from seeing them in person. Important observations such as the way patients walk, their breathing patterns, or other more subtle signs of illness could potentially be missed in telehealth visits due to the inability to listen to breathing or check a pulse or other vital signs. One participant explained the important role the physician plays in the effectiveness of a telehealth visit.

“I think if you have good assessment skills and ask the right questions you can have good quality. But if you're a provider that doesn't ask good questions or don't have the experience to know what to ask. You could potentially miss things” (Participant 9).

Overall, most healthcare professionals interviewed in this study have a relatively positive outlook on telehealth care quality. This positivity appears to be correlated with the type of care being given in addition to the skills of the provider using the platforms. Even the most enthusiastic providers acknowledge that virtual care does have downsides.

Pandemic-era Changes in Job Responsibilities

Overall, 100% of healthcare professionals interviewed for this study experienced changes in their job roles since the COVID-19 pandemic spread rapidly around the world. Four participants shifted from being bedside nurses to other positions. One began working in the COVID unit, while another went home to work as a virtual case manager. The third also went home and currently works in virtual admissions and discharges from a hospital, while the fourth individual became a care manager for virtual health. Another participant became their department's Director of Telehealth and other individuals shifted their clinical responsibilities to aid COVID patients in the COVID ward, the Surgical Intensive Care Unit (SICU), and in COVID respiratory illness clinics and test sites.

“[Telehealth] has been a great transition due to medical issues that I personally have, so it allowed me to continue my practice and still do nursing”

(Participant 9).

Understanding the shift that all the individuals in this study experienced due to the COVID-19 pandemic is an important finding because the pandemic and the rise of telehealth care go together due to the need to physically distance from other individuals as well as the shift to roles that support virtual healthcare. Many individuals in this study shifted from in-person positions to

virtual positions, which likely adds to their credibility as study participants since many of them were directly involved in these types of changes in healthcare settings.

Table 7. Provider's Experience with Telehealth Care

Answer Groupings	Percentage of Participants	Count of Participants
Positives		
Better Experience for Those with Specific Conditions	30.8%	4
Positive Staff Experience	15.4%	2
Negatives		
Difficult to Obtain Certain Information/Delay of Diagnosis	15.4%	2
Negative Staff Experience	15.4%	2
Difficult for those uncomfortable with technology	46.2%	6

Positives of Patient Experience: Better Experience for Those with Specific Conditions and Positive Staff Experience

When patients have conditions that can be properly addressed in a telehealth setting, the patient experience can be positive, as explained by multiple participants. On the other hand, if patients self-select for telehealth care services when their situation is not fit for this type of care, the patient experience, as well as the provider experience, is much more likely to be negative as minimal progress can be made.

“[Virtual admission and discharge] so far seems to be a positive experience for the patients and positive for the nurses because we’re actually able to complete that process [...] we’re able to take that part of the load off of them”
(Participant 9).

The second component of this quotation from Participant 9, indicates that telehealth care can help relieve the administrative burden placed on nurses. This can be a great benefit of telehealth due to the large healthcare provider shortages and provider burnout.

Negatives of Patient Experience: Difficult to obtain certain formation/Delay of Diagnosis, Negative Staff Experiences, Difficult for those Uncomfortable with Technology

“I think the potential negatives [of telehealth] are that it’s sometimes harder to assess the finer points of things like a patient airway exam” (Participant 3).

As mentioned previously, the most obvious downside of telehealth care is the lack of a physical examination. When a care provider cannot physically examine or test a patient on the spot, delayed care or missed symptoms become a concern. However, patients can quickly access a virtual appointment than an in-person visit.

Care could also be delayed if a patient should be seen in person, the tendency of a patient to select a virtual visit when an in-person one is needed could delay the care process.

“We did have a few situations in our clinic where we felt that the virtual care actually delayed diagnosis” (Participant 8).

This participant highlighted that when providing care virtually, a provider may encounter a patient who the provider believes should be seen in person; and this virtual visit potentially could delay care. If the patient had simply scheduled an in-person visit in the first place, the extra time and effort used for the virtual visit could have been eliminated.

Table 8. Making Telehealth Easier for Patients

Answer Groupings	Percentage of Participants	Count of Participants
Not Much can be Done	15.4%	2
Improve User-Friendly Technology	69.2%	9
Education of Patients and Providers	46.2%	6
Coordination of Care	23.1%	3

Not Much Can Be Done

Interestingly, when asked if anything can be done to make telehealth care easier to use for patients, two participants responded that not much can be done to help patients. The first participant further explained the response by stating that the technology is already user-friendly and healthcare systems have the broadband for it, so the participant did not have suggestions for what else could be done to make the process easier. The second participant also said that nothing could be done concerning phone or computer usage to make the processes any easier than it currently exists. These comments are interesting because while these two participants feel technology cannot be improved, nine other providers stated the opposite. Roughly 69% of participants stated they believe that creating more user-friendly technology is the best way to make telehealth easier to use for patients.

Improve User-Friendly Technology

One participant highlighted how having an E-mail address is necessary for many telehealth platforms, as the email address is often used to identify and communicate with patients. This participant suggested that it may be easier to have patients use their own devices or systems that do not require an e-mail address since certain populations, more likely elderly or low-income

individuals, are less likely to have an e-mail address. Moreover, many individuals may not have wi-fi access at all or may have poor access, which makes video conferencing more difficult. The technological difficulties are, therefore, further prohibiting patients who may need care the most from receiving proper treatments. One participant summarized this idea by stating what they believe is needed:

“One click. One click access. And then for those who do not have wi-fi, a non-wi-fi halfway to establish virtual visits” (Participant 6).

However, one potential downside to integrating more phone calls into telehealth services for those who are not as technologically savvy is that more information can be seen via video visits as compared to a phone visit as stated by Participant 8. Participant 9 further emphasized this point: that visually seeing the patient, even through a video conferencing system, is sometimes needed to take the correct steps forward. Additionally, Participant 13 highlighted the issues with phone usage in healthcare due to the reluctance of accepting calls from an unknown phone number. The concept of “phone tag” also comes into play when patients call their providers and they leave a message; and but when the provider attempts to call the patient back, they do not answer the phone. This is another important issue to consider since this common miscommunication can waste valuable time and resources.

Multiple study participants work in inpatient clinical care, where they work with Remote Patient Monitoring (RPM) for certain conditions. RPM can include wearable or devices patients can take home that allow the provider to electronically capture and record information from the patient. One participant detailed the types of experiences that an elderly patient in an RPM weight program may have.

“I’m going to send you home with an iPad and a program that you need to download and a digital weight that you have to sync via Bluetooth to do this every morning. And no, there’s no alternative [...] You have to follow the entire process, or the insurance company won’t pay” (Participant 10).

This quotation summarizes the experience that many patients have with complicated healthcare technology. Another important part of this comment is concerning insurance reimbursement. Insurance issues will be discussed later, but it is important to note that providers’ feelings, such as those seen here, are not aligning with the methods of insurance companies. Furthermore, this participant expressed a belief that

“The elderly need to be grandfathered out of the process [referring to telehealth] because we are doing them a disservice by trying to do them a service” (Participant 10).

This participant believes that too much effort, too many resources, and too much time are being spent trying to educate the elderly population on these new telehealth practices and that simply not including them in these services may be the most beneficial way to proceed. Many participants indicated that factoring in the elderly population into telehealth care solutions is needed, so while there is disagreement among providers, only one participant thought limiting telehealth options for the elderly would be an improvement.

Educate Patients and Providers

Overall, 46% of participants highlighted education as a key way that telehealth can be made easier.

“Education that even [patient’s] providers, or the brick-and-mortar institution, can say you can also get this [treatment] this way. Education is huge (Participant 1).

First, providers and the healthcare industry need gain more research that will facilitate education regarding what types of services can be safely provided via telehealth. After providers are properly educated, they can educate their patients as stated by Participant 1. It should be noted that providers are not the only source of healthcare related education for patients. Proper delivery of patient education also must consider the healthcare literacy levels of patients. One participant directly commented on the link between healthcare literacy and telehealth care.

“We often talk about patient medical literacy [...] we must assume that when we are teaching patients, or that we are giving them pamphlets, or whatever the education might be, we’re meeting them at a fifth grade reading level. Right? So, why should we assume that our patients are technologically savvy? (Participant 11).

While many participants argued that patients need to be better educated to properly use telehealth services, this participant brought to light an interesting point; that this education needs to occur at a 5th-grade reading level.

Coordination of Care

Three participants mentioned healthcare coordination when discussing ways to make telehealth care easier to use for patients.

“We need to do a better job of making the transition from in-person care, one-on-one conversations with your doctor, to a virtual setting, [...] whether that’s using a portal or an app or whatnot less scary for them” (Participant

Table 9. Most Important Issues in Telehealth

Answers Groupings	Percentage of Participants	Count of Participants
Provider Embracement	38.5%	5
Patient Education	23.1%	3
Coordination of Care	15.4%	2
Reimbursement/Insurance Coverage	53.4%	7
Access	38.5%	5
Equity	15.4%	2

Note: Many of the answers to this open-ended question are reiterations of comments made in response to earlier questions. In some cases, different participants made comments similar to those of previous comments from other participants in response to different questions. To limit repetition, these quotations were briefly described in the section corresponding to the question that prompted the duplicate response.

Provider Embracement

Approximately 40% of participants in this study felt that gaining support from providers, as well as the overall administration of health systems, is the most prominent issue in telehealth care.

“Your biggest barrier, and by your, I mean telehealth, is acceptance from health care, providers, and staff. [...] They have to want to use it. See the value in it for it to succeed as well” (Participant 11).

This participant went on to detail how the field of healthcare is typically “old school”, even though new technologies are being implemented and created regularly. This participant

emphasized how the current nursing shortage and the increase in healthcare worker burnout due to the pandemic has negatively impacted healthcare. Telehealth can help with these issues, but providers need to understand that technology is here to help and not hurt. It was mentioned by two providers that for in in-person settings, nurses feel as if they are being watched by telehealth technologies and therefore, are pushing back against it. As stated by these participants, this mindset needs to be changed to successfully make further progress with virtual care.

Patient Education

When asked what the most important issue in telehealth is, three out of eleven participants stated that patient education is one of the most important components of virtual care growth. This concept was mentioned earlier when discussing means to make telehealth easier for patients. One participant summarized the importance of patients and their families learning about and understanding telehealth care.

“You must have the end user i.e., the patient or the patient’s family be able to understand, use [telehealth care platforms] properly because without them it fails” (Participant 11).

This participant made it clear that without buy-in from patients, patient’s families, and providers, telehealth growth will be slowed and possibly terminated.

Coordination of Care

Improving care coordination was discussed previously as a way to make telehealth care easier to use for patients, but here coordination of care was also highlighted by two participants as one of

the most important issues in telehealth care moving forward. Not only is this essential for the patient experience but also healthcare professionals.

“Finding the right way to integrate [telehealth] into practice and then, you know, integrating it in in-person care” (Participant 2).

Reimbursement/Insurance Coverage

If providers are not compensated for their work in telehealth care, they will be much less likely to provide care this way, making the service less accessible to patients. Regarding telehealth care reimbursement, one participant highlighted why they believe the payment models are different.

“I think, until the payment models align, as long as you’re doing fee for service care. You know, people don’t want to pay. There’s other research that shows that people don’t feel that a telephone visit is worth the same as an in-person visit,” (Participant 2).

Reimbursement for telehealth services is a significant concern for healthcare professionals; many participants in this study recognize that if insurance does not adequately cover telehealth services, then patients will not choose to use these services, which affects providers as well.

“We’ve lost a lot of patients in our program or not taking them on as patients, because it’s not covered by insurance, and they’re not willing to pay out of pocket” (Participant 5).

access to those telecommunications needs to be considered a part of healthcare” (Participant 3).

In addition to the need for telehealth to be comprehensively covered by insurance, another participant added to this idea.

This participant brought to light the idea that if proper technology, such as a strong wi-fi connection is needed to receive telehealth care, then should this technology be considered a

part of healthcare delivery in general? This concept circles back to the insurance companies and their degree of willingness to participate and pay for these services.

Access

William Kissick's "iron triangle of healthcare" consists of cost, quality, and access. The ability of patients to access care has always been a concern in the United States. While telehealth care has been marketed as a way to reach more individuals and, therefore, to increase access, this may not always be the case.

This participant went on to mention how patients in vulnerable situations such as living in a remote area, being impoverished, or lacking transportation could see great benefits from telehealth care but likely struggle the most to access it.

Equity

The United States healthcare system has been striving for equitable care but often comes up short. One study participant discussed how telehealth care can help to decrease inequalities and

"I think digital health is one way of transforming or improving health care inequality, not just in the United States, but throughout the world.

Dissemination of knowledge and expertise can be done much easier"

(Participant 12).

make the U.S. healthcare system more equitable:

This participant emphasized that telehealth could increase equity and decrease inequality as the most knowledgeable healthcare professionals can now be reached much more easily by patients not only within this country but across the world.

Conversely, another participant highlighted how telehealth care has the potential to create further inequalities due to the technological capabilities of different patients.

“I do feel like my patients who are younger are more successful with telehealth visits, versus, say my elderly patients, who you know, they can’t figure out how to turn on the camera and then they’re just not able to get on. And so, the visit is shorter” (Participant 8).

Because of the large generational gaps that have been highlighted through the increased use of technology, healthcare inequity among age groups is a problem that needs to be further examined.

Final Participant Comments on Telehealth Care

Note: Most responses to this question simply repeated answers from previous questions. Only new answers and information will be included in this section, specifically unique comments.

Family Communication via Telehealth

Throughout this study, telehealth was discussed primarily as an outpatient tool. As many study participants have inpatient telehealth experiences as well, some shared their experiences during

the COVID-19 pandemic. One participant highlighted the important role virtual communications played for loved ones of the will when social distancing was mandated.

“[...] inside the Covid unit we had family members who could not visit their loved ones. So, what that entailed was if the patient or their loved one was dying, we had to find a way for them to be able to communicate or see their loved one and that had to come through video services through the Monitor, in the room where they could use an iPad where they could log in and have a video visit with their loved one. Say, goodbye” (Participant 1).

The experience this individual shared shows the ways telehealth can be implemented in healthcare beyond of an operational standpoint, as a board communication tool.

Telehealth Usage via Telephone

When discussing access in terms of telehealth care, one participant mentioned the struggles associated with blocked numbers and spam messaging.

“I think if we could do something about locked numbers [...]. The numbers are often blocked, or they come up as some type of spam or unknown. And so, people don't answer those, right, and then we play some phone tag, or they never look at it” (Participant 13).

This participant went on to describe the burden of “phone tag” that is created when patients and providers have barriers in their communication.

Healthcare Professional Personal Experience

One participant dove deeper into the provider experience than most.

“I think one of the things that lacks in telehealth is you don’t have the relationships that you’re together like you always are when you’re in the hospital.” (Participant 9).

This quotation is referring to peer relationships between individuals working in a healthcare setting. While this individual confirmed that they do not believe that the lack of personal connections between staff affects quality of care for patients, questions about the impact on morale and work outcomes could be raised.

While this participant believes that interpersonal relationships between co-workers are weakened due to the rise of virtual work, they also believe that for certain individuals this loss is worth the benefits they will gain from working at home.

“[Telehealth] is a great opportunity for people who are leaving bedside nursing, who have the skills and assessment training. [...] I could see that it would be very attractive to the nurse who is getting to the end of [2] career, [...] It is great for nurses with young families and childcare” (Participant 9).

Participant 9 also stated that working from home in a virtual care setting may benefit individuals who are immunocompromised.

Education and Telehealth

Through this research, multiple study participants felt that educating patients and providers are essential as telehealth grows. However, the idea of education for future providers was brought up by two participants.

“I think that [telehealth] is an emerging field that needs to be learned by med students and learned by residents” (Participant 8).

Beyond specifically educating medical students about evaluating patients via telehealth platforms, this participant displayed their concern for the healthcare field due to increased access for patients via telehealth without an increase in primary care education.

“My biggest fear with all of this is that improving access to more patients is great, but what it means is that we are making enough family doctors to take care of all of these people. There just aren’t enough primary care doctors. [...] So, we really need to simultaneously boost primary care education and have more people doing it” (Participant 2).

Lack of a Global Definition for Telehealth

When summing up their opinions about telehealth care, one participant highlighted an idea that this study may help to understand.

“What we don’t have is really just a definition of telehealth. [...] Some people may think that it’s only video. Some people may think it’s only patient portal type things” (Participant 13).

Although telehealth has existed for years, the rapid grow since 2020 has brought it to the forefront of healthcare conversations. Because of this expansion, this participant insists that all

people need to have a consistent definition of what telehealth means. This will allow for more productive conversations and a deeper understanding of telehealth care overall.

Chapter 4

Discussion

Introduction

The COVID-19 pandemic forced telehealth care to rapidly expand. This accelerated growth likely would not have occurred without the great need for virtual care in times of social distancing. This study seeks to understand more deeply the opinions about telehealth care of professionals in the healthcare field.

Quantitative Summary

A large majority of participants, who are experienced professionals in healthcare, believe that telehealth encompasses the use of phone calls, video calls, texting/online messaging, and e-mailing. The Mayo Clinic defines telehealth as “the use of digital information and communication technologies to access health care services remotely and manage your health care” (Mayo Clinic Staff, 2022). An even larger group of participants in this study currently utilize video calls the most in their roles. Prior to the COVID-19 pandemic, many participants had neutral feelings about telehealth, but in 2023, most patients indicated that they strongly like telehealth care. Overall, all participants like or strongly like telehealth, but all health care professionals have some concerns which will be detailed in the qualitative discussion.

Qualitative Summary

The convenience that telehealth care brings to the very complicated world of healthcare was mentioned throughout this research as a large benefit to both patients and providers. Moreover, increased access to healthcare is an important factor mentioned by many participants. More user-

friendly technology could help to further increase access by reaching individuals who are less tech savvy. However, as access is increased and more patients use telehealth services to receive care, all individuals involved in this process need to be aware of the types of conditions and symptoms that can and should be seen virtually versus those that need to be seen in-person. One of the most important concepts repeated by providers was the need for provider embracement of telehealth. While all the participants in this study said that they like or strongly like telehealth, other providers who do not feel as positively about this technology.

Provider Experiences

According to the American Hospital Association, due to transportation problems, 3.6 million U.S. residents do not receive the healthcare they should (American Hospital Association, 2017). Many Americans are not receiving proper healthcare, but to make matters worse the healthcare industry is facing large provider shortages. “The U.S. Bureau of Labor Statistics projects that more than 275,000 additional nurses are needed from 2020 to 2030,” (Haddad, 2023, para. 2). Due to the nursing shortage that the United States is currently facing, relieving responsibilities from the current overworked nursing staff is a great benefit of virtual healthcare in the form of virtual admissions and discharges. In 2021, 35% of healthcare employees were working virtually (Saad, 2022).

Multiple participants highlighted their positive experiences with telehealth working in an inpatient setting, while others also emphasized their love for working from home. Positives mentioned were keeping a job in healthcare if immunocompromised, providing childcare, and continuing to work if near retirement age and unable to manage the physical challenges of in-

person care. While all healthcare professionals in this study like or strongly like telehealth, some individuals in healthcare do not like it for multiple reasons. One issue is that some providers may feel as though they are being surveilled via telehealth. If staff is uncomfortable with certain telehealth platforms, this is an issue that needs to be addressed.

By 2030, all baby boomers will be 65 years or older (America Counts Staff, 2019). Due to the large number of individuals who will be in the elderly population in the coming years, much healthcare spending and services will be needed to care for these individuals. Healthcare professionals can utilize virtual care to their advantage during the nursing shortage to take some burden off the in-person clinicians caring for these individuals.

Care Coordination and Quality

The topic of care coordination is essential to consider when adding a new mode of care, such as telehealth, to the healthcare system. The need to coordinate services such as video visits and phone calls into the current in-person healthcare system is essential. This will entail new workflows being established in all organizations that utilize these types of services. If new workflows are created, providers will need to take the time out of their schedules to learn about them. Since these are potentially services that certain providers do not support, engaging them could be a challenge faced by the healthcare administrations. Even if providers are educated on telehealth care; patients also need to be educated. When thinking about educating patients, willingness as well as proper delivery of educational concepts needs to be considered.

Another important topic brought up in this study is the potential for delayed diagnoses. Based on an article published by Patient Engagement HIT, from 2017 to 2022, patient wait times for in-person visits have gone up 8%, reaching approximately 22 days in 2022 (Heath, 2022). This highlights a positive of telehealth since patients can have shorter wait times by seeing a provider virtually. However, in this study two providers highlighted that delayed diagnosis is a potentially negative aspects of telehealth care for two reasons. One reason is the lack of a physical exam, during which important indicators of illness can be missed. The second threat is incorrect patient or provider selection of virtual health as the mode of care. In both scenarios, the patient may be receiving inferior care as compared to in-person. Moreover, educating patients and providers about what types of symptoms may be suitable for a telehealth visit versus in-person can move patients through the system more quickly and not delay diagnosis. Future studies concerning proper techniques and triage of patient into a virtual setting are necessary so that these dangers are minimized.

Equity Concerns

Increased access and convenience were discussed as large benefits of telehealth and these ideas are often associated with increased equity. While some participants in this study agreed with this viewpoint, one participant highlighted the need to assess telehealth equity more deeply. In addition to inequity surrounding wi-fi access to reach providers virtually, ageism in telehealth care is a concern that needs to be acknowledged. A study about ageism in healthcare technology emphasizes that providers may be less likely to share telehealth service information with older patients (Zoorob, et al., 2022). Providers may have unintentional biases toward the elderly population or those who are not technologically inclined.

Another large equity concern in healthcare is the healthcare literacy of patients. This important concept of healthcare literacy is also relevant in telehealth care. According to the Milken Institute, 88% of patients do not have the healthcare literacy to comprehensively understand their care and navigate the healthcare system (Lopez, Claude, et al., 2022). If few patients can navigate traditional healthcare, this begs the question of how many patients can navigate virtual healthcare. Overall, the United States healthcare system needs to better educate patients, but in relation to telehealth care, education may be even more pertinent. Practices need to be put in place in healthcare to ensure that all patients are receiving all information needed to make educated decisions about their care.

Payment Issues

One of the largest concerns expressed by participants in this study is provider reimbursement and insurance coverage for telehealth care. The Emergency Use Authorization Act and the official first case of the pandemic occurred in 2020 (Office for Civil Rights, 2021). This act allowed for providers to be reimbursed for virtual care services. However, this is an emergency act, so many are concerned that this reimbursement may not last. For telehealth care to continue to grow and provide benefits to both patients and providers, providers need to be compensated for their virtual work. Moreover, one participant highlighted that patients or payers may feel as though telehealth care is not worth as much as an in-person visit due to the lack of physical exam as discussed previously.

Study Strengths and Limitations

A key strength of this study is the use of a mixed methods approach. Through the combination of quantitative and qualitative components in the interviewing process, a more in-depth understanding of participants' answers was acquired. Additionally, the ability to ask probing questions during interviews allowed for each interview to take a unique course and uncover new information. This study provides a strong basis of information surrounding healthcare professionals' opinions of telehealth care that can be expanded upon in future research.

This study does have some limitations. The sample size was only 13 participants. While this number would be small for a purely quantitative study, it is more standard for qualitative research. With more time, more participants could have been acquired and studied to add more opinions and thoughts to this research. Furthermore, the sampled population is not very diverse. Most participants are White females, which could potentially affect the types of answers being received. Moreover, since all participants have worked in the field of healthcare for over 16 years, these individuals are likely invested in telehealth because of how prominent it is in their jobs. Participants' telehealth experiences may impact their answers as compared to healthcare professionals who do not work with telehealth in any capacity. The results would have likely been different with a different group of participants

Future Research and Policy

Future research using larger and more diverse samples will improve the validity and generalizability of similar studies. Many concepts highlighted in this paper should be further researched. One of these concepts is how to best implement telehealth care in medical school training. As telehealth care grows, more conditions will likely be seen or potentially diagnosed

virtually. For this expansion to occur safely, clinicians need to be properly trained in examining patients virtually. Care coordination needs to be addressed as telehealth services are being integrated into all patients' care. Patient care needs to be as seamless as possible when using both modes of care, in-person and virtual. Lastly, equity concerns about telehealth need to be examined so that future policies and technologies can reach and help as many patients as possible.

As stated previously, the emergency use provisions allowing for reimbursement for telehealth care will not last forever. This act is what has allowed providers to be reimbursed for providing telehealth care services. The future of telehealth will most likely be determined by how the government reimburses for virtual care in the future and how insurance companies decide what will be covered.

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ACADEMIC VITA

Goal-oriented and highly accomplished undergraduate honors student seeking acceptance into a top healthcare master's program. Seeking to apply my abilities to collaborate well with peers and effectively apply my analytical skills to actively participate in a highly interactive program to earn the required credentials to serve as a healthcare administrator.

Education

Schreyer Honors College Scholar at The Pennsylvania State University, Bachelor of Science in Health Policy and Administration (HPA); Graduation May 2023

- College of Health and Human Development
- Dean's List (2019, 2020, 2021, 2022)
- Fasola Honors Scholarship Recipient (2022) – Selected based on top academic performance
- Honors Thesis Topic: Healthcare Professional's Perspectives on Telehealth Care (Completion May 2023)
- PSU HPA Marshall Raffel Student Showcase Finalist (2023)

Relevant Work and Skills

Intern at Massachusetts General Hospital in Ambulatory Operations and Services (May 2022 – August 2022); Mass General is the teaching hospital of the Harvard Medical School.

- Served at MGPO (Mass General Physicians Organization), the largest multi-specialty group in New England, to complete various high-priority projects managed by the Ambulatory Practice and Project Management team
- Utilized a complex provider template analysis software tool to redesign and optimize provider schedules
- Created and managed a survey to collect requirements from eight (8) specialty divisions.
- Engaged with Practice and Project Management Team members in informational interviews
- Completed training in Epic, the leading U.S. electronic medical record system.
- Earned recognition for taking initiative, adherence to best practices, dedication to teamwork, and adaptability

Peer Writing Tutor/Mentor for Health Policy and Administration Department (September 2021 - Current)

- Assist and advise 25+ students with classwork and writing assignments
- Guide students through class material twice a week in lectures
- Meet with students outside of class as needed, post weekly on message boards, and communicate regularly with students about upcoming events

Medical University of South Carolina (MUSC) Case Competition (Fall 2022)

- Earned opportunity to serve as a team member from Penn State University Staff
- Competed nationally against other universities in creating the most comprehensive plan to decrease hospital-acquired infections at MUSC
 - Placed in the top three universities based on our team's recommendation and presentation

Intern for SheSyndicate: TechSavvy Working Group (Summer-Fall 2020)

- Mentored women re-entering the workforce who needed to improve their computer literacy
 - Co-managed the program after being selected by the TechSavvy Working Group Lead
- Created 25+ informational documents and presentations; hosted 2 virtual sessions for participants, led 2 group discussions, and formed onboarding program for future interns
- Earned praise for leadership skills, quality of materials, communication, and organizational skills

Activities

National Honor Society for Health Professionals Member, Upsilon Phi Delta (Initiated April 2022)

Executive Board Member, Health Policy and Administration Club (August 2021- Current)

- Lead team of 115 club members serving as HPA Club President for the 2022-2023 academic year
 - Lead bi-weekly club meetings to educate about careers in HPA with guest speakers
 - Research and facilitate volunteer opportunities for club members
 - Served as the Service Chair, 2021

Phi Sigma Sigma Sorority (Initiated February 2019)

- Assistant Chair, Philanthropy Committee, 2020
- Philanthropy Committee Member, 2020 – Current

Penn State THON (largest student-run philanthropy; pediatric cancer fundraiser)

- FOTO Special Interest Organization member, 2020 – 2021

(Fundraising organization supporting THON)

- THON Rules and Regulations Committee member, 2020 – 2021 & 2022 - Current

(Committee dedicated to making THON weekend a safe event for all students)

- THON Operations Committee member, 2021 – 2022

(Committee focused on making THON a clean and smoothly run 48 hours)