AN EXPLORATORY STUDY OF PHYSICIAN PERSPECTIVES REGARDING VIRTUAL VISITS AND PATIENT HEALTH OUTCOMES

By

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DEDICATION

I would like to dedicate this paper to the following individuals. I could not have done this without you. First, I thank God for the strength and grace He granted me throughout this entire process. To my husband Richard, thank you for always believing in me and for tolerating my ups and downs. Thank you for being so patient! To my daughters Rayanna and Zephani, you were my biggest cheerleaders and constant prayer team. To my son Rick, you encouraged me like no one else. To my grandchildren Roslyn, David, Chambers, and Collins, you are far too young to know just how much you inspire me and make my life better. To my sons in law Daniel and Eric, thank you for being silently in my corner. And to my dad, Ramon V. Velasquez, who never saw me achieve my advanced degrees. I love you all.

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LIST OF ABBREVIATIONS

Abbreviation	Description
AHIMA	American Health Information Management Association
CPT	Current Procedural Terminology
EMR	Electronic Medical Record
HCPCS	Healthcare Common Procedural Coding System
ICD-10	International Classification of Disease-10th Ed.
IRB	Institutional Review Board
JAMA	Journal of the American Medical Association

ABSTRACT

Virtual visits can offer increased access to providers, convenience, and cost savings to patients, providers, and healthcare organizations. Although telemedicine's virtual visits are increasing in popularity and use in healthcare, few studies have included the perspective of physicians regarding the benefits and disadvantages to patient health outcomes by virtual visit participation. This study explored how physicians perceived patient health outcomes would be affected by virtual visit participation. This qualitative study was constructed using grounded theory methodology and data collected from twelve physicians representing different specialties. The data collected from the physicians resulted in three main themes: exam, money, and provider. The participants of the study offered knowledgeable and experienced insight into the role a virtual visit has in healthcare and patient health outcomes.

I. INTRODUCTION

Who purposefully wants to go to the doctor? Not only are doctor visits stressful, they are time consuming and inconvenient. Today's healthcare environment offers an option for patients to offset some of the inconvenience surrounding a doctor visit; the option is a virtual visit. The term *virtual care* is also used to describe a healthcare interaction where the physician and patient are not in the same room at the same time (McGrail, Ahuja, & Leaver 2017). There are many terms used when describing virtual healthcare. While distinctions are made in some situations, for the purposes of this study the following terms are interpreted to have the same meaning: *virtual visit, virtual care* and *telemedicine*. This study will use the term virtual visit throughout the text however, in some cases, where the participant stated telemedicine versus virtual visit, the term used by the participant will remain. A virtual visit is a visit to the doctor however, the patient and provider visit via a computer, smart phone, or tablet (Harvard Health Publications, 2016). A virtual visit offers physicians the ability to diagnose and treat patients remotely using different means of technology.

The word *telemedicine* is also used by healthcare agencies and associations when describing a virtual visit. According to an AHIMA Practice Brief, telemedicine is defined as "telecommunications systems that link healthcare organizations and patients from diverse geographical locations and transmit text, data and images for (clinical) consultation and treatment" (Kadlec & Buttner, 2017, p 48). The United States government website for Medicaid Services provides statute 42 CFR.410.78 which describes telemedicine as:

> For the purpose of Medicaid, telemedicine seeks to improve a patient's health by permitting two-way real time interactive communication between the patient, and the physician or practitioner at the distant site. This electronic communication means the use of interactive telecommunications equipment that includes at minimum, audio and video equipment. (Centers for Medicare & Medicaid Services, 2019)

Fast paced lives, demanding jobs, physical and travel difficulties are a few of the reasons a virtual visit appeals to today's patient. In the United States, the National Rural Health Association reports there are 200 networks that provide telemedicine with 3,500 service sites (Dostic, 2017). Telemedicine programs can provide virtual visits to serve patients who live in rural areas where physician access is limited as well in other areas where physicians or other medical providers are not easily accessible. Virtual visits can offer convenience and greater access to physicians from virtually anywhere. Dr. Ateev Mehrotra, internist, stated in *Virtual Doctor Visits: A New Kind of House Call*, "you're home sick, and 24/7 you can see a doctor on your electronics" (2016, p. 4). Teladoc Health, a phone based medical care provider based in Dallas, Texas, provided over 150,000 medical visits remotely during the first 3 months of 2015 (Roberts, 2015, p. 545). Today, Teladoc Health provides patients access to physicians in 130 countries. According to the Teladoc Health website, the company reported providing 2.6 million virtual visits in 2018 and states its membership, or patient population is currently 23 million individuals (Teladoc Health, 2019).

Virtual visits are not intended to replace all face to face visits. The article, *The Two Minute Virtual Doctor Visit*, describes how SmartExam, a virtual visit service,

encourages its patients to seek care for common conditions (i.e., seasonal allergies, coughs, colds, ear pain) however, serious conditions should be scheduled as traditional face to face visits (Livingston, 2017). According to a study of otology patients in India who used a telemedicine device, results indicated positive health outcomes as a result of increased access to care (Gupta, Chawla, Dhawan & Janacki, 2017). The study reported that due to a shortage of specialists trained in otology, patients with hearing problems were issued a smartphone enabled with a camera and otoscope. Community healthcare workers, not physicians, were then trained to use the telemedicine devices in effort to meet the demand for care. Patients who lived in remote areas received the devices and were then provided hearing screens and consultations via telemedicine with the healthcare workers. As a result, patients who required further care, for example surgical intervention, were then referred to and successfully treated by physicians who specialized in ear, nose and throat care. While virtual visit examples like this indicated telemedicine is beneficial and cost effective among cases for patients who experienced hearing issues, further study is necessary to include the perspective on outcomes from a variety of medical specialties.

Telemedicine's virtual visits can also be a complement to and an economic boost for healthcare organizations and some providers. As technology continues to improve, virtual visits are now available in most every medical specialty (Hersh et al., 2001). Using the American Medical Association's 2016 survey, Kane and Gillis estimated that 15.4 percent of physicians use telemedicine in their practices (2018). Additionally, some healthcare systems are adding virtual visits to complement their current patient care model (McGrail et al., 2017). Virtual visit encounters are expanding health care

interactions beyond the United States. In a 2013-2014 study conducted in British Columbia, Canada, results concluded that there were 7,286 virtual visits involving 144 physicians and 5,441 patients (McGrail et al., 2017).

Studies found in the literature mostly address, from the perspective of the institution or the patient, the access, convenience, and cost saving capabilities of virtual visits. As more patients begin to familiarize themselves with virtual visits and their use increases, additional study on the merits and concerns of its use by physicians, as well as their perspective on resulting patient health outcomes is important.

Purpose Statement

The purpose of this study was to explore the perspectives of physicians regarding how participation in a virtual visit may impact patient health outcomes. This research sought to identify whether some physicians perceived a virtual doctor visit, filtered through technology, may have negative impacts on patient health outcomes. This study explored patient safety and quality of care during a virtual visit as perceived by physicians. Care was taken to explore and understand whether the participants believed a virtual visit could benefit patient outcomes when compared to a traditional face to face physician visit.

II. LITERATURE REVIEW

Access and Convenience

There are three goals used when healthcare organizations measure performance. These performance goals: access, quality, and cost are referred to as "the iron triangle" of healthcare (Smolensky, 2003, p.14). Telemedicine's virtual visit has the potential to influence the iron triangle of healthcare. Dr. Aaron Carroll, health services researcher and Vice Chair for Health Policy and Outcomes in the Department of Pediatrics at the Indiana University School of Medicine, states in his blog post *The "Iron Triangle" of Health Care: Access, Cost and Quality*, that telemedicine can make the healthcare system more affordable, but at the expense of reducing quality or access. He goes on to say that [telemedicine] could also improve access, but at higher financial cost or lower quality (Carroll, 2012).

Telemedicine allows for the delivery of healthcare services and medical education for patients remotely (Sood et al., 2007). Patients who experience physical or emotional difficulty when needing to visit with their doctor now have alternate means for visiting with their doctor when previously there may have been none. In 2018, the Pew Research Center reported that 95% of consumers in the United States own a mobile phone, and 77% own a smartphone (Grewel, Beitelspacher, Noble, & Nordfalt, 2018). As a result of this considerable technological and cell phone ownership, connecting to a virtual visit physician is easy and makes healthcare more accessible to Americans today.

In their recent study, McGrail, Ahuja, and Leaver (2017), reviewed physicians who provide care by virtual visit. They identified these physicians to be working in low

operating clinics, those with smaller operating costs, rather than high. This indicates physicians likely to be using virtual visits are those who provide care in a *virtual walk in* clinic. Physicians working in a retail walk in clinic provide care to patients without an appointment. A walk in clinic is defined by the Centers for Medicare & Medicaid Services as a health clinic located "within a retail operation *other than an office,* urgent care facility, pharmacy or independent clinic not described by any other place of service code" (Centers for Medicare and Medicaid Services, 2009, p.1). A virtual visit is like a retail walk in clinic visit because pre-scheduling of an appointment is not necessary.

Cost

In a recent study, Skilled Nursing Facility (SNF) hospitalizations were reviewed and found to be costly. The researchers of this study reported that due to the unique approach telemedicine provides, it may assist with greatly reducing SNF hospitalizations (Driessen, Castle, & Handler, 2016). Off-site SNF providers who use telemedicine's technological support, for example audio or video consultations and wound care cameras, are available to consult with patients who are homebound or have limited access to transportation which can result in reduced SNF hospitalizations (Grabowski & O'Malley, 2014). In addition, telemedicine facilitates accessibility and empowers patients to assist with the management of their own health which results in cost savings (Smith & Satyshur, 2016; Byung-Kwang, Minchul, Tomoko, Melnikow, & Marcin, 2016).

Telemedicine provides cost benefits for both patients and physicians (Kadlec & Buttner, 2017). However, according to *Telemedicine Still Struggles to Gain Traction*, due to its restricted billing policies, the business of telemedicine was found to be slow in its

expansion. In the article, Mario Guiterrez, president of the Center for Connected Health Policy in Sacramento, cites the Center for Medicare & Medicaid Services (CMS) beneficiary eligibility criteria to participate in a virtual visit as one such barrier for the delayed expansion (HCPro, 2017, p 3).

Quality

A recent study on the economic benefits of telemedicine states how this technology can impact and improve quality patient care when utilized for follow up care. According to Kolltveit et al., (2017), because telemedicine is capable of supporting management of patients between primary care physicians and specialists who are at a distance, hospital visits are reduced. One example of how hospital visits are reduced is during treatment of diabetic patients. Patients with diabetic foot ulcers often need frequent hospital consultations however, virtual telemedicine enables change in this treatment protocol. With the use of telemedicine, healthcare professionals can transfer and review images of foot ulcers thereby facilitating wound care in a patient's home (Kolltveit, et al., 2017). The patient's quality of care remains high while the time required to receive care is greatly reduced. In another study, Smith & Satyshur found the caregivers of children with diabetes to be highly satisfied with not only the quality of care their children received but also with the ability to see a provider sooner via telemedicine (2016). Additionally, some respondents in the study stated that visits to the doctor which usually took the entire day due to travel, were reduced to an hour with telemedicine (Smith & Satyshur, 2016).

Although accessible and quality care is possible via virtual visit, there can be circumstances where quality can be negatively affected. One example of improving access while potentially impacting quality is the possible absence of a complete medical history during a virtual visit. When participating in a virtual visit, the provider may have limited access to a patient's medical history. Combined with the probability of seeing an unknown provider during a virtual visit, the potential exists for the provider to not have all the necessary previous medical information on the patient seeking treatment. Because a virtual visit physician is unlikely to know a patient's lab results, complete medication list, and complete medical history, diagnosis and subsequent treatment may be problematic (Harvard Health Publications, 2016). While access to a physician is facilitated, a limited medical history could lead to incorrect diagnosis and treatment which could decrease quality health outcomes and overall care quality.

It is important to the world of healthcare to study the access, convenience, cost benefits, and quality of care telemedicine's virtual visits *can* provide today's patients and healthcare organizations, however, it is also important to understand from the perspective of physicians *how* this all may impact patient health outcomes. Although research on health outcomes includes projected benefits and suggested healthcare outcomes from statistical data, the research includes limited input from physician perspectives (Hersh et al., 2001). There is little research dedicated to patient outcomes from the perspective of physicians and it is likely due to the relative newness of the virtual visit service and limited participation among physicians.

III. METHODOLOGY

This qualitative research study was designed using a grounded theory approach. Grounded theory involves systematic collection and analysis of data as it pertains to a phenomenon (Strauss & Corbin, 1990). Grounded theory is a method used for rigorous critical analysis (Charmaz, 2012). This method was chosen due to "emphases on examining processes, making the study of action central and creating abstract interpretative understandings of the data" (Charmaz, 2006, p.9). A principle technique for grounded theory, inductive analysis, was applied throughout the study, beginning with the collection of data from the first interview subject. Qualitative data was gathered from a series of interviews to achieve confluence from various physicians' perspectives and record rich, detailed data. According to Glaser, "the product of classic grounded theory is abstraction, not accurate description, thus classic grounded theory is not aimed at solving the accuracy problem" (Glaser, 2001, p. 129). By using inductive analysis, patterns, categories, and themes emerged from the data "rather than being imposed on them prior to data collection and analysis" (Patton, 1980, p. 306). As I applied grounded theory and continued to analyze the data, three themes resulted and I was then able to produce a theory (Bowen, 2006).

Sensitizing concepts helped shape this study (Bowen, 2006, p 3). Because I had worked in medical clinics, and based on my prior observations, I was motivated to explore whether virtual visits are good for health outcomes from the perspective of physicians. The subject of virtual visits was especially interesting to me because when I worked in healthcare, over five years ago, virtual visits were unheard of in healthcare clinics. I sought to understand how physicians felt about virtual visits and if they

perceived any outcomes might be negative. These sensitizing concepts, or starting points, helped "inform the overall research problem" with an initial framework to organize and examine the research data collected (Charmaz, 2003). By using an inductive approach to generate a theory from the data, I was able to systematically identify patterns which then emerged as themes (Lincoln & Gruba, 1985).

Research Question

To gather data which would offer insight to and address my sensitizing concepts, I developed a research question I believed would do just that. The research question addressed by this study was, "How do physicians perceive the increased use of virtual visits may impact patient health outcomes?" Few studies have explored how physicians perceive patient virtual visits and patient health outcomes. This research sought to understand, from physicians who practiced medicine in various specialties, their perspectives, common practices, concerns, and ideas regarding virtual visits in the clinic setting.

Sampling and Recruitment

The primary method of identifying participants for this study was purposeful convenience sampling. Convenience sampling of physicians with whom I worked in the past was used. Twelve participants were interviewed for this study. The participants range in ages from thirty-seven years of age to sixty years of age. Ten of the providers were male and two were female. Seventy-five percent of the physicians practice medicine in Texas. To achieve the desired level of diversity, the specialties represented in the study are: pain care management-, internal medicine, family medicine, podiatry, general

medicine, primary care, psychiatry, dermatology, and emergency room care. To recruit subjects for participation with this research, the physicians were invited to participate via email or text message of a recruitment notice. The recruitment notice is provided as Appendix A. Physicians were asked to reply with their decision to participate by return email or text. Although unsuccessful, snowball sampling was attempted by inviting each physician to identify one or two other physicians from their specialty who might also have useful insight to contribute. Two physicians assisted me by contacting additional participants however, I was not provided the physicians' contact information for privacy. As a result, I was unable to send a recruitment notice to the physicians myself. I was informed the consenting physicians would contact me so that I could provide them with further study details however, neither reached out to me. The study proposal submitted by me to the Texas State University IRB stated ten participants would be interviewed during the time-constrained study. After interviewing twelve participants, I did not recruit any additional participants as I had met and exceeded the proposed number of participants to be included and the collected data was sufficient for analysis.

Data Collection

Grounded theory depends on data. Data was collected by means of semi-structured 30-minute private interviews with physicians from various specialties. Interviews were conducted beginning March 1, 2019 and concluded on April 28, 2019. For local physicians, the interviews were conducted in the physician's clinic and private conversations were digitally recorded. Physicians who were remote were interviewed using a recorded online meeting in a room either at their office or other private location. The interview protocol is provided as Appendix B. During interviews, follow-up

questions were used when necessary to elicit rich details and to allow participants to freely express their perceptions based on their understanding of the original question.

Informed Consent, Compliance, Confidentiality

The Texas State University IRB determined that no signed informed consent was required for this study and that voluntary participation implied consent. The IRB approval letter is provided as Appendix C. All participants were verbally notified of their ability to withdraw at any time or to decline to answer any question.

With respect to confidentiality, all collected data, written, recorded and transcribed was maintained and secured in a locked cabinet in my office at Texas State University when not in use. No other person had access to the collected data. During transcription of recorded data, the identity of each participant was hidden using a pseudonym to maintain confidentiality. Where appropriate, quotes used throughout the text were modified slightly to protect the safety and privacy of the subjects and the confidentiality of the data. Modifications are explicitly indicated near the quotations.

Risks, Benefits, Compensation

The risks to participants of this study were deemed minimal by the IRB. A potential risk was that a physician might unintentionally disclose patient private health information during reflection of an experience or scenario while participating in a virtual visit although unlikely. Appropriate steps, such as deletion of the comments, were used immediately when needed. The anticipated benefits of this research included further understanding of the impact on healthcare outcomes of patients who participate in virtual visits and how this knowledge may be shared among physicians and or healthcare

providers. No compensation was offered or provided for participation or upon completion of the interviews.

Coding and Analysis

According to Strauss, to become proficient at qualitative analysis, a researcher must learn to code (1987). A code is a word or short phrase that captures the essence of collected data (Saldana, 2009, p 3). Codes are used by qualitative researchers to develop categories, followed by development and identification of themes which will then lead to a theory of the data coded (Saldana, 2009).

I share the following paragraph to expound a touch of humor on the coding process I followed for this study. In order to refine my coding skills, *I coded everything*. I even coded the transcription of my weekly peer review sessions. That effort resulted in my finding two consistent codes, *more* and *add*. Those codes translated into a significant theme that not only summed up each review session, but the overall study. The resulting theme was *Expand*. I was able to expand all areas of my data combined with the guidance provided during and after peer reviews. As a result, I better understood the information I collected and strategized on how to use it.

I began my research by organizing my notes, journals, articles, and any books to be used throughout the study. Interview transcripts, journals, memos and peer review notes were all divided so as not to confuse or dilute the process. I then applied the first cycle coding methods, attribute, structural-holistic, descriptive, and in vivo to the data I collected (Saldana, 2009, p 48). For example, during first cycle coding, I divided each transcribed interview based on the question asked and the response given. The initial

codes generated are presented in Appendix D. I then coded each paragraph within the question-answer section. The second cycle codes are provided in Appendix E. I gave explicit attention to in vivo coding. In vivo coding is not only suggested to be appropriate for all qualitative studies, but is used according to Saldana to, "prioritize and honor the participant's voice" (2009, p 74). I certainly wanted the participants knowledgeable and experienced voices to be heard throughout this study.

After first cycle coding was completed, I began second cycle coding. Second cycle coding is an advanced way to code by re-analysis of the data via first cycle codes. During second cycle coding, I was able to sense the shaping of categories and eventual themes of the data collected. I read, reviewed and analyzed the study data daily. Although my codes became fewer, my data became rich. The data became meaningful with actions and explanations and my study was underway. I applied the second cycle coding methods of focus coding and theoretical coding vigorously as these methods are those that develop grounded theory (Saldana, 2009, p 151). Paragraph by paragraph coding was again used to allow for further exploration of research focus and assignment of theoretical categories as described by Charmaz (2012). Codes were collected, sorted, and organized into recurrent themes. The relationships among codes and themes are provided in Appendix F. In post-coding, I transitioned from analysis of codes to pre-writing followed by the final development of my theory and writing of my study (Saldana, 2009).

Trustworthiness

Trustworthiness is an important standard among qualitative researchers. Trustworthiness was addressed in order to achieve maximum dependability of the

collected data. To ensure trustworthiness, my study process included weekly audits and peer review of my notes, codes, and collected data with my thesis committee chair. I documented my research and provided traceability of previous and current research and committed to processing data in a logical means (Tobin & Begely, 2004). Trustworthiness consists of four criteria: credibility, transferability, dependability, and confirmability (Lincoln & Gruba, 1985). Table 1 illustrates the criterion and techniques used to prepare my study.

Establishing Trustworthiness

CRITERION	TECHNIQUE
Credibility: *Confidence in the truth*	Persistent Observation Peer Debriefs Member Checks
Transferability: *Findings have applicability*	Journal Writing Memo Writing Thick Description
Dependability: *Findings are consistent and can be repeated*	Inquiry Audit
Confirmability: *Extent to which findings are shaped by respondents and not the researcher bias*	Audit Trail Triangulation

Table 1. Establishing Trustworthiness

The plan for this research study was written within the proposal submitted to the Texas State University IRB. I enlisted the assistance of experts, a committee of three graduate faculty from Texas State University's Health Information Department, to review the findings of this study. One faculty member was selected as my study chairperson and the remaining faculty were study committee members. I participated in scheduled and

impromptu peer debriefs with my study chairperson to add credibility to my study. I also participated in member checks with the entire committee by providing study drafts to them for their review and feedback. In order to address transferability, I kept a journal that included my field notes while conducting interviews. I documented in my journal my feelings and thoughts while conducting this research in order to reflect, recount details I may have forgotten, and to encourage myself. For example, shortly after I began one interview, one of two electronic devices I was using failed. I reflected on a 'to do' list I had prepared for myself which included that I needed to be prepared for technological failures. I was grateful that I had prepared myself well because, I had a third device with me which I was able to use during the interview. I was able to move forward with confidence and no disruption of the interview. After the interview, I included a note in my journal about the gratitude I felt for being so well prepared. I wrote memos throughout the entire study to capture events and secure an audit trail.

I kept a log of all interview dates and times and included any observations I made. In my memos, I included the setting during my conversations as well as the attitude of each participant during their interview. I noted how during each interview, every participant was eager and willing to contribute to this study. I found each participant to be serious with their responses however, one hundred percent of the participants were humorous and lighthearted as well. In addition, during peer reviews, I was guided to capture exactly what it was I was being told by the study's participants. As noted by Butterfield, Borgen, Amundson & Maglio (2005), to further ensure trustworthiness, I made certain with participants during interviews that I understood their responses to interview questions in order to ensure accurate interpretation of those

responses for quality and credible analysis of data. All participants were responsive when I asked for and needed clarification. Each participant happily obliged me without hesitation.

The committee chair reviewed categories from the data analysis in order to determine that the findings were accurate and useful, thereby establishing further credibility of the research. Upon completion of the study and the final paper was composed, findings were submitted to my study committee for additional debriefing to strengthen accuracy. I committed to this process to inspire trustworthiness of my study. The entire process took over twenty-four months as it began immediately after the decision was made to pursue this study in February of 2017 and did not end until the study's defense date of June 26, 2019. According to Lincoln and Guba (1985), readers are able to judge the dependability of research better when they are able to review the entire research process.

IV. RESULTS

Upon analysis, the data revealed three substantial themes: exam, money, and provider. These themes described the narrative of the participants perceptions, thoughts, and ideas on telemedicine, specifically, a virtual visit. The first theme revealed the providers felt the ability to complete a *comprehensive* exam is removed due to the separation of a patient and physician. The second theme identified how the physicians' felt about money and the role it plays in healthcare. The third theme revealed how the participants felt regarding telemedicine's virtual visits and how it applied directly to providers. Each theme will be addressed below.

Exam

All twelve participants perceived virtual visits would allow patients faster access to treatment however, the participants also perceived patient health outcomes will remain the same with virtual visit participation. According to one physician, "access is faster [but] good health requires a *commitment*." The participants of the study also believe that virtual visits will be beneficial to patients regarding the cost of care. About these perceptions, one physician stated, "[virtual visits] are getting healthcare quicker to the patient …that is part of the outcome…[patients] are spending less money to get the same result."

Physicians interviewed for this study perceive telemedicine as good for some aspects of health outcomes however, they included serious concerns about others. For example, one hundred percent of the participants believe virtual visits are good for follow-up care and common illnesses. However, a serious concern raised by several

physicians was that some illnesses, even common ones are far more complicated than they initially appear. A cough was used as one such example. One participant explained, "there are some medical conditions where [virtual visits] are not going to be a problem…but there are others that may be…for example, someone who is complaining of a cough but might have a little bit of shortness of breath which [changes] things." In cases such as this, several physicians felt a virtual visit would result in an inadequate examination which would hinder a providers' ability to render the right care.

All study participants said they had participated in at least one form of virtual visit based on their understanding of a virtual visit. Examples of the virtual visit providers stated they had participated in included: follow up care via cell phone, email correspondence, communication via patient portal, and facetime. All participants stated they had participated in courtesy virtual visits with established patients or someone they already knew. Hypothetical examples were used with those patients to illustrate and or explain their concerns or perceptions. Additionally, two of the twelve participants stated that not only do they offer courtesy virtual care to their established patients, they also currently provide reimbursable virtual care to unknown patients as part of their work. Neither participant used actual clinical visit examples during interview responses as precise care was taken to maintain patient privacy.

Several physicians stated while some examinations can be conducted by visual means, most patient examinations require a *hands on* examination by a physician. One participant stated, "you have to *see* the patient [in person] first and then they can go to telemedicine." Additionally, according to several participants, many examinations require the use of diagnostic tools such as lab work or x-rays to complete an assessment and

render a diagnosis. The participants noted while not all diagnostics are available during a face to face visit, the additional diagnostic tools would not be possible during a virtual visit.

Physical Separation

For most individuals, *going to the doctor* means, to be *in the presence* of the doctor. Patients may expect to be examined by means of physical touch during a doctor visit. Although telemedicine has great potential for reducing healthcare costs and may improve health outcomes, physicians who participated in this study expressed concern over the removal of human touch during participation in a virtual visit. The participants believe the distance and physical separation created during a virtual visit would result in greater opportunities for miscommunication and misunderstanding which could impact patient outcomes.

When asked to consider the perceived disadvantages of virtual visits, participants reflected on patient encounters throughout the workday. Collectively, all twelve participants cited human touch as vital for a thorough examination. The participants perceive the loss of physical touch during patient encounters is a disadvantage which can negatively impact care. Participants stressed the importance of needing to *touch* and *see* their patients. The physicians voiced concern over the potential loss of the *patient-doctor relationship* aspect of healthcare. The participants worried the separation and distance created by a virtual environment might impact a physicians' ability to stay personally connected to their patients. All twelve participants were certain that the need for human touch was too valuable to dismiss during a healthcare visit. The providers stated that in

many cases, a response to treatment results from not only the physical examination of the patient, but the personal connection created during the visit. *Touch, see, hands on* and *complete picture*, were terms consistently mentioned throughout the interview process.

One participant explained:

> without a good *hands on* physical exam, without an opportunity to really assess the patient in person, you're not getting a complete picture and when you don't have a complete picture, you tend to develop a more defensive style of medicine and so what that means is you may prescribe more often than you should.

This general concern was additionally supported when two participants, from different specialties, commented respectively, "you have to know, be there, get to *feel* it [patient illness]…*touch* it and that's what makes a good physician, you have to *feel* the situation to know this patient" and another stated, "I still don't see how we're going to get past the *physical part* of *touching* and pushing." While access and convenience are favorable reasons to participate in a virtual visit, communication by physical touch matters to physicians. As one physician cautions, "when [physicians] do not have access and convenience to something as basic as a set of vitals, you are already making assumptions and that causes a cascade reaction where those assumptions lead to errors."

Additionally, five of the twelve participants expressed that in order to establish a healthy relationship which, according to them, leads to better patient health outcomes, they need to connect on a personal level with their patients. The providers stated they wanted their patients to feel comfortable and be willing to disclose any and all health concerns. They felt this level of comfort may be more difficult to achieve from a

distance. One participant commented “being able to connect is huge and important to physicians” and another stated “it [virtual visit] seems cold.” The participants felt it is important to capture and maintain real rather than virtual connections with patients to wholly understand their patients and the patient’s illness. In a recent article, the narrative supports the participants concern. The physician author notes concern for diminishing patient-doctor relationships. He states that while few physicians will question the value of long-lasting personal relationships, these relationships are increasingly rare. He lists restrictions by payors that make staying with the same provider of choice difficult for patients as well as an increasing mobile society as culprits (Cifu, 2018). Establishing a good personal relationship with one’s healthcare provider brings added value and benefits to patient outcomes.

Furthermore, research participants expressed concern that some physicians may become complacent during virtual visits resulting from lack of human touch and personal relationships. Eleven of twelve participants used the word the “miss” to communicate thoughts regarding this subject. The central matter repeatedly raised was that physicians could “miss” important clues as a result of the separation and distance between patient and provider. Several respondents were found to suppose care could become robotic. In addition, study results indicated half of the participants felt that loss of personal interaction would be a huge disadvantage for health outcomes. According to one participant, “science is hard, medicine is soft.” These findings conveyed the perception on how the convenience of virtual visits could promote random doctor-patient relationships rather than the substantial familiar relationships gained when patients establish with a primary care physician in a brick and mortar clinic.

Respondents offered the following examples as to why they perceive lack of personal interaction with patients is a disadvantage. When comparing a face to face visit to a virtual visit and the lack of personal and physical interaction, one physician said, "I need to [be] with them in person to detect detail…it is vital to reduce errors." Another physician stated, "I need to personally *see* the patient's pain and it's impossible with a virtual visit." One physician said, "I need to be able to *see* if a patient is making adjustments to their own health." And, yet another related both the missing personal relationship and the inability to touch a patient during assessment as "*feeling* and *touch* [are] necessary for many correct diagnosis and treatment plans." Evidenced by multiple responses, some physicians interviewed perceive that a virtual visit may indeed complicate health outcomes without the ability to touch or physically connect with patients. The physicians indicated the removal of those two components during a virtual visit would certainly create a gap in assessment which could lead to diagnostic errors.

The participants of this study consistently caution the absence of personal relationships and human touch will negatively impact healthcare. So important are physical relationships, physicians who participated in this study were additionally found to agree that there will never be a "good time" to deliver devastating news to a patient via technology. In a recent article, the San Francisco Chronicle reported about the granddaughter of a dying patient who posted to social media about how she and her family were given the prognosis of their loved one. The article stated the granddaughter and her family, *including the patient*, were told by a Kaiser Permanente virtual doctor, on video, the patient's only option was comfort care as [he] no longer had functional lungs (Allday, 2019). The article stated further that the family was not only devastated to hear

the news but also deeply hurt the news was delivered by a robotic doctor. During two interviews, this article was briefly referenced. One participant, while discussing the article, stated, “when the time comes for me to have my face on a screen to tell a patient devasting news or they are imminent, I’m out.” Another physician eloquently said, “if we are committed to healthcare through education, studies that include conversations like these are beneficial, useful and serve to help us understand how we can improve health outcomes both face to face and virtually for all.”

It is important to note, while a personal connection may be more difficult with the distance and separation a virtual visit provides, diagnostic and communication errors can also occur during traditional face to face encounters. An investigation of diagnostic errors by physicians reports physicians miss or delay care resulting from either failure to report, order or follow up patient care. An analysis of 583 self-reported physician errors concluded that 69 percent of those errors were of moderate or major impact to health outcomes (Schiff, Hasan, Kim, Abrams, Hasler, & Odwazny, 2009). However, an online report on patient safety states errors by physicians are currently unmeasurable. The report indicates when physicians are unable to follow up with patient care after diagnosis, physicians will likely be unaware of any error they may have committed. Unreliable systems for patient follow ups and triage by telephone were among the reasons listed for the increased errors. In addition, the report states further research on computerized error support is a current undertaking (Agency for Healthcare Research and Quality, 2019).

From the perspective of participants, doctors who fail to value human touch and personal relationships may pose a risk to health outcomes that reach beyond just the patient. Physicians who participate in virtual visits should exercise caution to not become

an extension of the technology they use and become programmed themselves. In *The Moral Quest*, the author discusses morality among medical care providers in one chapter. He states even the most motivated physicians to do the right thing, those who commit to high level patient care, can become merely a professional rather than a care professional over time (Grenz, 1997). He writes, in effort to uphold beneficence and non-maleficence, the central virtues of healthcare, actions by healthcare professionals can sometimes also become "mechanical" (Grenz, 1997, p 292). When healthcare becomes devoid of human to human exchange at the expense of technology, there will only be the humans to blame.

Medical History and Medical Record

Participants of the study highlight an incomplete medical history or lack of a complete health record as an additional area of concern during participation in a virtual visit. A patient's health record includes transcribed or handwritten notes, images, and electronic data that *details* a patient's health information furnished by healthcare providers (Oachs & Watters, 2016, p 98).

During an initial visit, it is important for physicians to not only establish a good relationship, but to also acquire a complete patient medical history. It is possible that during a virtual visit, the provider might not have a complete medical history because he is engaging with a previously unknown patient. According to two participants who currently provide commercial virtual visit services, they usually do not have access to patient medical records during a visit. They stated they receive health status and some additional health information from a patient intake questionnaire. The questionnaire is completed by the patient seeking a virtual visit just prior to the visit itself. The depth of

medical history gathered from the questionnaire is unknown to me however, based on the information given by the participants who provide virtual visits, it is limited.

When considering the virtual visit's assertion of a *quick, accessible, easy* and *convenient* visit for the patient, fulfilling that expectation might not allow time to access a complete medical record from a patient's primary care provider. During a virtual visit, time spent is a part of the focus. Half of the study's participants described the time they are given to devote to a single *traditional* patient encounter is presently not long enough and feel a virtual visit would shorten encounter time even further. According to several participants, their time with patients is limited because their practice administrators are results driven. One physician said, "there's so many things that I have to do during [a] 15-minute visit…that 15-minutes is not just 15-minutes of taking care of the patient, I'm doing all these other requirements I'm supposed to do." Another participant stated, regarding allotted encounter time, "this is an environment for unrealistic healthcare." When combining the possibility of an incomplete medical history, the physical separation and an expectation to fill schedules, the physicians perceive health outcomes could be negatively impacted by virtual visits.

Study participants agree a medical history could also be withheld during a face to face visit. However, they perceive a virtual environment may make withholding a medical history more likely. All twelve participants agree that inadequate patient assessments result in misdiagnosis which delay and complicate health outcomes. An example of an incomplete assessment complicated by lack of a complete medical history was explained by one physician using a patient with a headache as the example. The participant noted, "with a headache, there are many times when a physical eval and

[medical] record is very important…especially in the case of a virtual visit with a provider they have never met before." Similarly, when reflecting on the potential lack of a medical history, one study participant stated, "virtual visits leave a lot of room for a physician to presume things about the patient on the other end…medicine does not work on presumption." One physician added, "we have two scenarios, where a patient comes in the office and the patient is sitting one on one speaking to the history being examined by the doctor…versus the other scenario when the patient is sitting at home *trying* to communicate."

Equally, all participants felt patient health outcomes may be compromised by incomplete medical histories. One physician expressed the lack of a reliable medical record as "with virtual visits, the patient can tell the provider whatever they want." Another equates the lack of medical history during a virtual visit as "basically third word of mouth" and a third explains that without a complete history, "you really want to screen someone to ensure…appropriate treatment…it's going to be hard…it's virtually impossible." One physician added about medical histories, "most important is also the medical history…90 percent of what you need to know during a visit is in the history."

Another physician described the lack of a medical history as treating patients "blind." According to several participants, some patients do not know their own medical history. Patients who are poor historians add to the disadvantages perceived by physicians regarding virtual visits. A patient's education of their own health history is important to health outcomes although the physicians agree, medicine is not up to the patient to understand. According to four participants, patient memories can sometimes be

unreliable, and unknowns can have serious consequences. The following example was provided by a study participant:

> with a virtual visit, there is a break in the [history] system, the break is the unfamiliar to the physician with no previous [patient] history, the patient appears to have a urinary tract infection so an antibiotic is prescribed, but I know the patient and they are resistant to that antibiotic and then they see me two weeks later far worse off…the virtual doctor did not have the rich history to show that the antibiotic they chose, the patient has been resistant to every single time and the patient did not remember either because they do not know what medicines they have been prescribed.

Although the study's participants' thoughts are that medical history details during a virtual visit are paramount for quality health outcomes, patients do not always disclose a complete medical history during a traditional face to face visit either. Jessica Girdwain explains how patients do not always provide doctors with all the necessary information they need to make a sound diagnosis. She describes how lies, details that are omitted, and facts that are twisted are not only dangerous for patients but can also be life-threatening (2013). To further substantiate this, one participant commented "during a [virtual visit], a patient could just click off even if they're being forthcoming…they're going to change their mind, the [visit] is not going to proceed…I'm sure as easily as it [happens] in the clinic." Yet another physician said, "[a patient] is talking to a physician that's never examined [them]…[we physicians] know patients may not completely divulge all the appropriate medical history." Whether in person or at virtual distance, clearly not everyone is, or chooses to be, unreserved and frank with their physicians.

Regarding a medical record and how it is used in healthcare assessments, a 2017 study found discrepancies between what patients report and what was included in an electronic medical record. Medical records may not always have accurate and or complete patient histories. In this ophthalmological study, researchers found there to be inconsistencies that were significant between what patients self-reported and what was documented in their electronic medical record. The study reported a bias toward more reporting of symptoms by the patients than that which was noted in the medical record. The study concluded that these discrepancies have implications for patient care and note caution should be exercised when using electronic medical records (Valikodath et al, 2017). This is not to say medical records are unreliable, but medical records can often include inaccuracies.

In healthcare, having a familiar primary care physician is an advantage. At some point, most people will experience changes in health status. Although all twelve participants believe and agree that virtual visits can be advantageous for patients, the physicians felt strongly that patients who seek treatment consistently from the same provider fare much better with outcomes. One physician pointed out, “things change, but you know your patient.” Another said, “being the physician that knows this patient, you know their history.”

The study results indicate the potential absence of a complete medical record during a virtual visit raises concerns among the study’s physicians, nevertheless, the physicians offered ideas for improvement on this matter. Nine out of twelve participants noted and believed direct access to medical records by unknown virtual visit providers would be a benefit that would add to the success of health outcomes. Fifty percent of

respondents recommend outside services such as virtual visit providers have at the very least 'read only' access to medical records. One physician noted "they're technically a partner." When discussing patient privacy and medical history, one physician stated, "to be done properly, this simple [virtual] communication…we need to be compliant with the various [rules] and guidelines…not to be, it's not ok." From the perspective of the physicians in this study, one clear advantage to better health outcomes during a virtual visit is consistency by means of a complete medical history, provided privacy rules are maintained.

Laboratory Testing and Diagnostics

Laboratory and diagnostic tests will always be a part of medicine. Physicians rely on test results to rule out or confirm a diagnosis. Participants of the study indicated that in many cases they require diagnostics, for example x-rays and lab work, to render accurate diagnosis. All study participants expressed concern as they tried to determine how they would gather test findings during virtual visits. Nine out of twelve respondents said that some patients who are seen in their clinics often forgo instructions to get diagnostics. They worried a virtual environment might increase the tendency further.

Several physicians mentioned specialties which require a "heavy touch" and those that do not. According to the physicians, *heavy touch* was used to describe examinations that require palpitation or pushing on and moving of the patient as well as very specific provider skill. As stated by one physician, "putting hands on it." The heavy touch specialties referenced were, physiotherapy, podiatry, cardiology and neurology. Every physician in the study stated the specialties mentioned are not well suited for virtual

visits. One physician added, “telemedicine or a virtual visit, it’s a huge benefit for certain things [but] I wouldn’t want my heart surgeon to do it.” Because the diagnostic measures involved for diagnosis and subsequent treatment among these specialties is critical and require specific skills, the physicians felt the risk to a patient during a virtual visit was far too great. One physician remarked, “the more detailed the examination needs to be, the less amendable the visit is to telemedicine.”

The physicians added further examples when discussing missing diagnostics. During interviews, hypothetical scenarios were often used by physicians to illustrate their concerns. One example was provided when discussing patients who may need medication refills. One physician commented, “how would you [physician] do a urine screen?” Another hypothetical scenario described a patient who may have either sprained an ankle or broken it. The focus was the inability to get an x-ray needed to not only confirm diagnosis but to also initiate correct treatment. During a virtual visit, getting the necessary x-ray would certainly be difficult. One physician added, “they are going to need to be sent somewhere for an x-ray, meanwhile that’s a waste of time and that’s if they really do go get one when they are told.”

The participants agree diagnostics are not always easy to obtain with traditional visits. All participants used words such as, “need lab work”, “need x-rays” or “need tests” when discussing how lab work and diagnostic testing factor into their decision making. One physician said about virtual visits, “they’ll have to get it [x-ray or lab work] somewhere and it’ll be pretty hard to confirm if they do.” Another physician remarked, “[without diagnostics] we may have an idea of the diagnosis, but they’ll require the other studies to [absolutely] confirm it.” Additionally, one physician stated a serious concern

that some virtual visit providers may "bypass diagnostics to provide [an] immediate result to [a] patient on a virtual visit" and that would be "incredibly dangerous." The inability to secure diagnostic measures is perceived by the study participants to be a greater disadvantage to achieve better outcomes during virtual visits. The consensus among participants regarding lab work and diagnostic tests was they are necessary to determine the best course of treatment. One physician simply said, "some specialties are too complex for virtual visits." According to the doctors, early treatment causes early recovery but if treatment is delayed as a result of missing diagnostic tests, a small problem can become a big problem.

Patient Education

As virtual healthcare expands, the study participants believe the medical community must come up with a model to meet the virtual healthcare expectations of the next generation. The model must include what is necessary to ensure the best interest of the patient is met. One study participant stated "[a virtual visit] works when doctors are active participants and not merely a person on the other end of technology providing a service." Physicians rely on a patient's account of symptoms combined with their own expertise to recognize signs to accurately diagnose illness. However, facilitating this exchange can often be a challenge.

Physicians think in medical terms. Medical terminology is the language of doctors and is necessary for them to examine a patient and render an accurate diagnosis. As one physician stated, "everything has a name." According to several of the physicians, medical language or medical terminology barriers are common between them and their

patients. Study results indicate the physicians interviewed believe patients who combine the convenience and access to virtual physicians with self-treatment and education via the internet can lead to more and serious health complications. One participant exclaimed, "the internet doctor!" The participants perceive too much internet access [to medicine] is not always a good thing.

One participant noted that some patients do not know their left from their right. Several providers shared how terms like lower and upper can be difficult for patients to articulate to a doctor. Respondents felt that the inability to communicate specific areas of pain or problems by patients is an added disadvantage when patient and doctor are not in the same room. One physician stated, "directions and instructions are harder to follow when patient and doctor are separate." Another physician explained "at least when we are together, I can guide them." And yet another described the following event:

> I've done this before…you feel like you're talking in circles, ok, you know that big bone, go down from there, go a little forward, I'm not sure you're pushing in the right place…when you talk to a patient that's not familiar with anatomy or the names of things, it gets a little more difficult…you're always questioning…it may get a little frustrating.

The medical language barrier can certainly be problematic during a traditional visit but could be far more difficult during a virtual visit. This is especially true, according to several participants, when they as physicians feel they should have *hands on* the problem instead of it just being described. The following example was shared by one physician; "has it gotten bigger...patient says no during a virtual visit but when seen in person, the

physician would absolutely disagree." To this point, one physician is quoted as saying "I will need to imagine what it must be like." Clearly, interpretation by a patient can be grossly contrary to a doctor's opinion.

According to several participants, people need to be clear about the importance of prevention and proactive healthcare. One physician explained, "patients will need to understand when it is important to make the time at all costs to be seen in person or when a virtual visit is okay." While physicians of this study perceive virtual visits as good because access and convenience are important to today's patient, all twelve participants agree combing patient knowledge with doctor expertise will be another driving force as to how beneficial those outcomes will be.

With the inclusion that medical language barriers are encountered daily in their respective clinics, the participants suggested the language barrier may be further complicated during a virtual visit. Each physician interviewed was able to recall a situation or situations within their clinic to support this concern. Several indicated that while medical language barriers make their jobs difficult in person, it is of greater concern over distance. To be clear, the study participants were quick to point out the lack of medical terminology, anatomical and physiological knowledge is not the fault of patients.

Benefits of Virtual Visits

Participants of the study collectively agree there is a good place for virtual visits in medicine. When asked to share their perspective on how virtual visits would benefit health outcomes, all participants were quick to cite management of chronic illnesses as its

highest benefactor. All participants agreed access to physicians for continuum of care would be most beneficial. According to one physician, “stable patients comprise 75 percent [seen] so virtual visit follow-up care is extremely beneficial.” All physicians interviewed mentioned better outcomes result when an established, chronically ill patient can be monitored, even over distance. Because chronic illness is managed best with routine follow ups, including post-operative cases, when minor issues arise, during a virtual visit, patients can be treated quickly and conveniently while the patient remains at home.

According to the physicians of this study, there are illnesses that do not require a physical exam at every visit. Patients who can be monitored via written documents such as lab results, medication lists, diet and exercise are ideal candidates for follow up by virtual visit. As a result of the convenience a virtual visit provides, study participants stated this as good for patients and physicians alike. One example of how virtual access and convenience make a difference is during management of chronic diseases such as diabetes. Diabetic monitoring can be completed while not only the patient, but the physician remains at home. Lee & Lee explored and found in a diabetes management study that chronic management of such illnesses is not only beneficial to patients but cost effective as well (2018). The participants relate the improved access to physicians by established patients in need of continuum of care as a positive impact on outcomes. Figure 1 illustrates interpretation on how by means of intertwined virtual visit technology; access to physicians is facilitated, patient care management is improved, care costs are contained, and the patient-provider relationship remains strong.

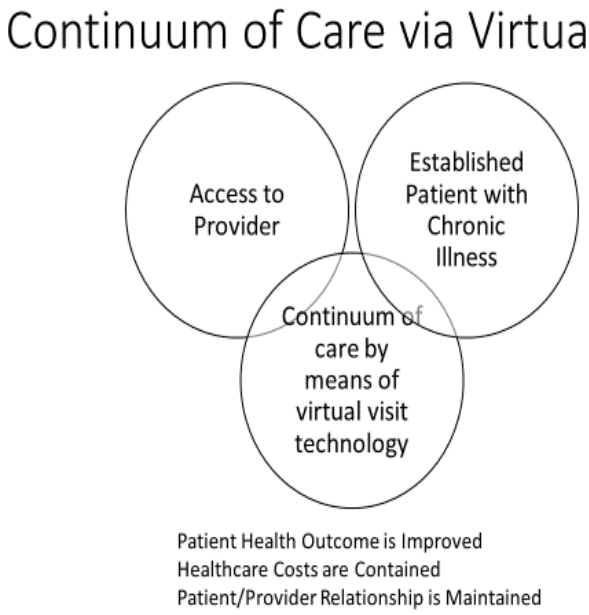


Figure 1. Continuum of Care and Virtual Visits

Another example of how access to physicians and the convenience of virtual visits facilitates care was explained in 2016 study on hip replacement. Researchers found that by using telemedicine, patients who underwent hip replacement surgery could be released from the hospital after only one day and have their post-op monitored over distance. The study concluded that not only was the hospital length of stay (LOS) reduced, patients recovered without sacrifice to safety or compromise to their quality of health post-op (Vesterby et al, 2016). In addition, the continuum of care resulting from an *acute* illness was noted by four study participants. One study participant was able to broaden the depth for follow up care after acute illness with the following illustration:

> after acute illness, for example a car accident, follow up care is manageable although the result of the accident may mean no more vehicle, the convenience of

> a virtual visit from home eliminates the delay and follow up is easy…the added stress of having to *plan* for follow ups is eliminated…no need to worry about *how* you will get to the doctor…acute illnesses are very disruptive and costly…a virtual visit can eliminate [such] barriers.

Time matters in healthcare and a virtual visit can be a huge asset to time management. A combination of traditional and virtual visits are perceived time and cost savers by participants. Time management is a cost-effective goal in a medical practice. Virtual visits with established chronically ill patients would enable fast and convenient review of patient status. Follow up care can be expedited with virtual visits and although study participants remained concerned about "missing something", their concerns were greatly reduced since a patient history is known during continuum of care with established patients. Patients can be seen and treated faster while at home. One provider stated, "follow up care is good when adjustments need to be made [quickly] and virtual visits offer the convenience to do so with an established patient…that's really nice."

Another noted positive was waiting time is eliminated. Waiting rooms would not be congested and physicians could treat more complicated patients with face to face visits. Seventy five percent of study participants stated that the time they could save by participation in virtual visits would result in freedom to not only see patients from anywhere but to also see more patients. The physicians felt that because a virtual visit is quick and ideal for continuum of care, they could see more complicated patients in their clinics thus increasing their daily encounters which is cost effective for all involved.

Visits of the Future

The study results found that physicians routinely place the needs of their patients before their own. Results consistently suggest that the providers who participated in this study are committed to doing the right thing not only for their patients, but also the healthcare community they serve. Results also indicate that all participants agree virtual visits will be a large part of healthcare in the future. The participants of the study perceive newer generations will drive the way healthcare is delivered. One physician stated, "telemedicine is going to happen regardless…it is like a snowball, either we defy it or assimilate…you are in or you are out." Another physician said, "ahh, it's the future [and] it's going to take some adjusting." Undoubtedly, the participants of this study will do everything *they* can to ensure quality health outcomes during virtual visits now and perhaps in their futures however, their responses suggest they may be hindered to do so. Several physicians stated the US healthcare system was once such hinderance. One study participant stated:

> trying to do the right thing for the patient every virtual visit wouldn't really make that much of a difference as far as quality goes…there are other things that would make [health outcomes] better as far as quality…we need a better healthcare system in general…I don't think telemedicine makes that much difference.

Another physician said, "I don't think telemedicine makes that much difference in other countries with very good healthcare…I just see that their healthcare systems are better period." When taking into consideration how previous technological advances have impacted health and the current US healthcare system, future use of telemedicine and virtual visits would benefit with additional and careful planning. A well-planned delivery

model for virtual care is important to help avoid future unintentional poor health outcomes. Therefore, the responses shared by the study's frontline experts are to be valued and deeply considered before going 'all in' with virtual medicine.

Money

It is important to discuss the influence money has on healthcare. Money drives patients and healthcare organizations alike. All stakeholders, patients, providers and organizations understand money matters with healthcare. In a recent poll report titled *The US Healthcare Cost Crisis*, 1 in 4 Americans do not seek medical treatment because of the cost of healthcare (Gallup, 2019). The poll reports the US spends more on healthcare than other advanced economies. According to the poll results, in order to pay for healthcare costs, 4 million Americans borrowed, at minimum, five thousand dollars. Therefore, the total Americans borrowed to cover their healthcare costs was $88 billion dollars (Gallup, 2019). However, the global content network, PR Newswire, describes telemedicine as *lucrative*, new and trending in the medical industry (PR Newswire, 2016). While healthcare can be a profitable business, the participants also included how they felt about the role of money in the world of healthcare.

The study participants provided valuable and important insight on how they believe money impacts healthcare. Included in their perceptions on the value of virtual visits, the participants of the study shared thoughts on the following potential financial barriers they feel should be addressed. The participants remind us of how money factors into healthcare and how often it is the quality of healthcare for the patients which is a tangible casualty because of money and its role in healthcare.

Reimbursement

Study participants identified money matters such as billing and reimbursement to be strong factors that impact health outcomes. All participants expressed frustration about the role money has in medicine. Half of the study participants felt that the current cost of medicine shapes doctor attitudes that may cost healthcare more in the long term. Several participants also felt virtual visit participation was not accurately valued based on its current reimbursement structure. Participants specifically referred to the current Medicaid and Medicare reimbursement guidelines on virtual visits as examples. They all felt current laws and policies for virtual visit reimbursement are an obstacle not only to its [telemedicine] growth but also to the patient care its use can provide. Participants point out inconsistent billing procedures as a large part of the problem.

Eleven out of twelve participants noted they are dissatisfied with insurance and its effect on medicine. All twelve said insurance and its politics is an obstacle that impacts health outcomes in mostly negative ways. One physician boldly stated, “insurance is a nuisance.” According to the physicians of this study, they felt CPT and ICD-10 billing codes for virtual visits are not standard or clear. Participants highlighted their frustration due to guidelines that make billing difficult. Although study participants felt excited about the potential benefits virtual visits bring to health outcomes, 100 percent stated that their reimbursement return on investment with virtual visit participation must also be there. According to one participant, “in this incentivized healthcare system…administrators do not recognize a virtual visit as equal to face to face…*doctors do the same work for less pay and not given the credit for [virtual] visits as they would with face to face in clinic appointments.”* All physicians underscored how during virtual

visits many doctors will treat patients the same and dedicate the same amount of time as with a traditional visit yet will be reimbursed significantly less.

Currently, Medicaid allows physicians who treat patients by virtual visit to bill for such services however does not recognize telemedicine as a distinctive service. To compound the frustration felt by respondents, Medicaid allows *each state* to determine billing codes rather than standardize billing. According to the Medicaid telemedicine website, each state may decide to utilize, from a variety of HCPCS codes, CPT codes and modifiers, which codes to use for telemedicine billing purposes and reimbursement. Additionally, each state can decide whether to cover telemedicine services or not (Centers for Medicare & Medicaid Services, 2019). The online Medicare telehealth insurance coverage information page states that telehealth services include office visits however, "these services are available in *some* rural areas, under *certain* conditions, but *only* if you're located at one of these places" (Centers for Medicare & Medicaid Services, 2019).

Nine physicians who took part in this study practice medicine in Texas. I looked to the Texas Medical Association for information on its telemedicine or virtual visit guidelines. In 2017, the Texas Medical Association established three core principles regarding telemedicine. One principle, licensure, states that the practice of medicine occurs *where the patient is, not where the physician is*. Therefore, a physician who participates in telemedicine in Texas must hold a license in Texas. The second principle, adherence, states that the standard of care for telemedicine is *to be the same* standard as that for in-person care. Lastly, the third principle, payment, states when medically necessary, a covered service is to be paid *regardless of how it is provided* (Texas Medical

Association, 2019). With this information, it is reasonable to understand provider frustration. One physician stated, “I don’t know all the reimbursement details…I believe Texas is making [or] has made changes…[the] case of reimbursement is a challenge now.” Participant dissatisfaction regarding these policies was further made clear as one provider is quoted as saying, “we have all these requirements from the state…each state is different and that’s part of the issue” while another quipped, “I have to learn more things…why do I have to learn that…I already have all the CPT codes…another nine-nine codes, great…seriously, great.”

According to the participants of the study, high patient volume, or patient encounters are expected in their respective clinics. In order to meet administrative expectations, participants state they often must delay charting and routine follow up notes and extend beyond the regular workday. The participants stated they do not receive pay for the extended hours and are not given credit by employers for doing so. Participants stated from their experience that currently insurance companies do not pay physicians for the additional time spent on documentation. The physicians feel precedent has been set. One physician commented, “why would [insurance] pay for this part of doctor workday with virtual visits when they do not pay for it now…physicians are doing it anyway for free.” Added frustration was equally shared among all the physicians that regardless of the type of visit, traditional or virtual, their liability remains the same therefore they should be reimbursed the same.

Technology

Combined with reimbursement dissatisfaction, the providers felt the startup cost of telemedicine technology could impede virtual visit participation by doctors. Nine out of twelve respondents felt that not all physicians will be able to afford bringing a virtual visit option to their practice. Participants felt that high quality technology, the best for quality outcomes, would be a financial burden to most physicians. If the technology needed to provide adequate assessment during a virtual visit exceeds profit capabilities, physicians are not likely to invest. To help understand this dilemma, one provider offered the following hypothetical example:

let's say the virtual equipment costs one million dollars…and reimbursement for it [virtual visit] is low because it is ideal for common illnesses which makes most sense...the virtual visit [hypothetically] pays $28 per visit…well, the investment does not make sense because you get paid $125 for the same face to face visit…[many patients would need to be seen] to make up the difference.

The physicians also felt the quality, or lack of, telemedicine technology would impact health outcomes. Technological failure, by both the equipment and user, is important to consider with healthcare. Technological equipment for healthcare must be of excellent quality and the provider using the technology should have the excellent ability to use it. Physicians of the study believe the ability to provide a good examination with technology is impacted when either the equipment or its user is not good. Participants additionally expressed concern regarding patient participation capability. Some physicians worried that patients who are not comfortable with technology could be

negatively impacted as well as older patients who are unable to access healthcare via technology.

To make virtual visits effective, providers stated they would require, or at very least desire, the proper and right equipment to *see* and *hear* patients without difficulty or interruption. Sound and lighting could be problematic. Faulty equipment could make conversations unclear and or distort visuals. The location of the patient and the device they use are important to consider as well. One physician imagined this scenario as an example of concern:

> lighting…I may have to say, you need to be near a light source so it's not so dark, those kinds of things…the last thing you want to do is look at something in a dark room and say it doesn't look infected and three days later you hear from them again and now it's really infected.

According to one study participant, the US Department of Veteran's Affairs (VA) has issued a healthcare mandate and stated the mandate goal is to provide US veterans the ability to access physicians quickly and conveniently from anywhere. As a result of this mandate, all VA providers will be able to support virtual care for veterans. The participant included the VA plans to issue high quality technology necessary to meet this goal to all VA providers and that presently cameras are being provided first to psychiatrists. This mandate allows veterans who require psychiatric follow up care the convenience to deal with non-issues conveniently and with minimal disruption. Restrictions apply to the mandate, for example, veterans in need of psychiatric care must be thoroughly assessed and deemed to not have any risk associated with virtual care.

Patients must agree to participate by means of virtual care however, this agreement does not apply to the initial visit. Veterans of the VA healthcare system who reside in rural and urban areas have seen an increase in access to providers resulting from clinical video utilization. This increase is noted especially among veterans who necessitate mental health care (Adams et al., 2019). Regarding the access and convenience given to a patient seeking psychiatric care, one physician stated, "if [veterans] can utilize telepsych or telemedicine, there is no excuse not to be seen." Given access to quality cameras and technology is a tremendous value for VA providers and the veteran patient population they serve. That is a healthcare win.

Consumerism and Health

With healthcare in mind, quick, easy and cheaper may not always in our best interest. Participants of this study, by means of their responses, alerted me to examine how technology has impacted healthcare in the past and continues its impact today. Healthcare consumers, or patients, have expectations of healthcare and those expectations are changing. Today, time is a valuable commodity for many. More access to healthcare is deemed necessary by many because people want an easier and faster way to seek treatment for an illness. Today, people want time for other, more exciting life options. The following describes the perception of one study participant;

> the new generation is tech savvy…they do not want to come in to an office…they order things online and [items] arrive [fast]…they do not want to call, make an appointment, wait for the day of the appointment, take off work, drive to the visit,

fill out papers, wait in the office…they look at [this] as, nah, that's got to be upgraded.

Traditional visits take too long to schedule. Traditional visits with physicians can take a lot of time out of the day. Convenience is important because often patients do not wish to simply be inconvenienced. And, the cost of care must be advantageous to the consumer patient as well. Advanced technology can certainly provide and fulfill those expectations. However, we cannot deny that the very technological advances we covet to make life better, easy and convenient, might indeed make things worse.

We cannot deny virtual visit technology is indeed convenient and increases the opportunity for faster and often less costly healthcare and treatment. However, history tells, in effort to conform to societal demands for quick, easy, cheaper lives, by means of technology, often the opposite occurs. The following examples serve to show how consumerism can translate into negative health outcomes with technology.

The invention of the telephone made access to others easier. Rather than take the time to drive to someone's home to visit and enjoy conversation, a telephone call could be made instead. A telephone call *saved time*, was *easy* and saved transportation *costs* while accomplishing the basic task of communication. As technology advanced, smartphones were invented. Smartphones made life easier by offering access to so much more. Smartphones made shopping, education, social interaction and even searching for love convenient, and today, healthcare. People do not need to leave the confines of their home for many things if they do not wish to do so. However, personal relationships and human interaction has declined as a result. Some studies find an increase in anxiety and

depression among many who use smartphones. In his study, Cain (2018) finds that smartphone use has indeed created negative effects in users and correlates a rise in depression and anxiety particularly among today's generation and youth. In another study, the results indicate smartphones have negative effects among users. Among the effects listed were increases in negative emotions, compulsive behaviors, lack of control and maladaptive coping skills (Horwood & Anglim, 2019).

Similarly, there is television. Television offered consumers great *access* to entertainment. Television saved people *time* and *money* because they could now be entertained while at home. To further save time, TV dinners were introduced to the home. Although TV dinners might not have been nutritionally sound, many enjoyed them. Many people now delighted in staying home, eating TV dinners and watching television from the comfort of their couch. People then became sedentary, gained weight and welcomed a host of poor health conditions into the home as well. Studies on how the television and or screens have affected healthcare produced alarming results. For example, a study on the effect of watching screens found significant health concerns among children (teens) ages 12-17. Suchert, Hanewinkle, and Insengee (2016) found teens this age will spend an average of 3 hours per day watching a screen. Their study of 1,228 individuals found the teens to have increased body fat. The study found the teens to be positive for obesity. The findings also found the teens to have negative concepts of self which resulted from dissatisfaction with their bodies.

For many, money has also been touched by technology. Paper money often does not make good sense to some people. Virtual money does. Virtual money has impacted health. To make items for purchase *accessible* and the buying experience *convenient*,

credit cards were introduced to consumers. It became easy to buy what one liked and required little effort. Today, for example, after a quick internet search and a scan of items desired, by using a credit card to pay for the items, instant gratification is only a click away. Now food delivery to one's home can take less than two hours and online retail stores can deliver goods in two days. However, as a result of credit card use, consumer credit card debt is high.

Increases in anxiety, depression, regret, and anguish over the debt can also occur. Individuals who experience chronic debt stress are found to have increased blood pressure and reduced immunity. The American Psychological Association (APA) website lists health risks to the body that result from chronic stress. Within the cardiovascular system alone they have found an increased risk for hypertension, stroke and heart attack for those who experience ongoing stress. According to the APA, chronic stress can have serious effects on health and the body (American Psychological Association, 2019). The promise by technology to make life accessible, convenient and cost effective has the potential to impact consumer health and be as much of a disadvantage as an advantage.

Provider

Additionally, respondents expressed concern regarding who may currently and or eventually be providing care via virtual visits. All study participants cited the skills and knowledge possessed by virtual visit providers as crucial for successful outcomes. The providers feel having both competencies will have the most impact on quality health outcomes.

Skill and Knowledge

To meet the convenience promised to patients and meet the expectation of administrators to see as many patients as possible, virtual visits may fulfil both requirements. However, participants feel the fulfillment may not be with fully credentialed physicians. The respondents felt the low virtual visit reimbursement structure will lead to more non-physicians, for example; APRN's or PA's being hired as virtual visit providers. The physicians did not doubt the capability of non-physician providers to render care however, stressed gaps in assessment and treatment capabilities exclusive to non-physician providers. The following policy was perceived as a clear disadvantage associated when rendering a diagnosis for non-physician providers.

An Advanced Practice Registered Nurse (APRN) does not have the authority to diagnose and treat without the oversight of a supervising physician in most states. The scope-of-practice laws are varied and although APRN's have the education and training, independent practice is difficult (McCleery, Christensen, Peterson, Humphrey & Helfand, 2014). As a result of the policies that govern non-physician providers, physicians of this study note that they must review the encounter however, they do not receive reimbursement for their knowledge, skill and time. A noted primary disadvantage here is a delay in diagnosis which in turn delays treatment. The participants cited the possibility of a cursory assessment by a mid-level virtual visit provider could negatively impact patient health outcomes and patient cost savings as well. A recent study on a telemedicine program specializing in pediatric diabetic care discussed the collaboration among APRN's, physicians, and other ancillary healthcare providers. The study stated the program was successful, the standard of care had improved adherence, both caregivers

and patients were satisfied, and there was quality improvement. The study stated the APRN's provided leadership and expertise on the technology used although, to ensure all the information required by the diabetes physician specialist, much additional coordination was necessary (Smith & Satyshur, 2016).

Half of the study participants felt due to the current reimbursement structure of telemedicine's virtual visit many virtual visit providers are not, and will likely not be, medical doctors. One physician commented, "[we have to think] the other person on the other end of the virtual visit doesn't have a medical degree either…an evaluation is only as good as the person providing it." The physicians reiterated how important both the skill and knowledge levels of a virtual visit provider can impact health outcomes and believe reimbursement should reflect and match both.

Disadvantage

Because a *detailed* examination during a virtual visit is not possible, the study physicians believe over prescribing of medications, particularly antibiotics, by virtual visit providers may occur. Half of the participants felt some provider's judgement could be clouded by the virtual patient's expectation of quick access and convenience to do something. Although not all illnesses require medication, participants of this study felt that a prescription would likely be given to satisfy a patient's expectation of receiving care. Regarding this *virtual* dilemma, one physician commented, "we know, many illnesses we deal with in primary care [are] really viral…antibiotics are not appropriate…but there's always this pressure to give the patient something…for the effort they made to contact us." Collectively, all participants expressed concern that

prescribing of unnecessary medications, particularly antibiotics, may result from a virtual and inadequate patient assessment. Nine physicians raised serious concern that patients who participate in virtual visits may do so with the expectation to have their illness cured during the visit which could lead to provider to rush to judgement.

Ten physicians of the study felt many providers of virtual visits might satisfy patient expectations by prescribing unnecessary antibiotics. One physician passionately stated, "we are currently trying to combat overuse of antibiotics worldwide." Another physician stated, "over prescribing can give rise to complications and creates an environment for worsening illnesses." The physicians included that combined with being unable to gather a good history and a good physical exam during a virtual visit, a start down the wrong path is likely. The wrong path possibly being medication misuse. One physician said, "with a face to face visit, [a physician] can see patterns of health and antibiotic use." The physicians felt that misuse of medication not only delays care but is also costly to the patient and healthcare provider. One physician said potentially, "you end up finding out later that you made a mistake or missed something…now you have to rethink everything you've done…in the meantime, you and [the patient] have wasted a bunch of money and [time]."

In a study of 13, 400 telemedicine visits resulting in a respiratory infection diagnosis including bronchitis, pharyngitis, and sinusitis, findings indicated that 67% of those encounters resulted in antibiotic prescription (Martinez, Rood, Jhangiani, Boissy, & Rothberg, 2018). The authors concluded a direct correlation between shorter (time) visits such as a virtual visit and the increase in antibiotic use as it may be faster to prescribe an antibiotic to the patient rather than explain why it is not needed. When citing the need for

antibiotic prescriptions, one participant said, “there is a one in eleven chance you will make someone better with antibiotics…there is also a one in eight chance that you are going to hurt someone with antibiotics.” The participants repeatedly cautioned that by giving a patient an inappropriate antibiotic, the condition escalates.

In the United States, the Centers for Disease Control (CDC) states antibiotics are not needed to treat runny noses, bronchitis, the flu or colds as overuse of antibiotics leads to antibiotic resistance. Currently, the CDC reports that 30% of all prescriptions (47 million) for antibiotics are unnecessary. Antibiotics are effective when patients are at high risk for developing infections. Patients who are undergoing surgery, chemotherapy, and those with End Stage Renal Disease are among those who will benefit from antibiotic prescriptions and not those with common illnesses. The CDC reports that among the current threats to public health, antibiotic resistance is among the “most” urgent (Centers for Disease Control and Prevention, 2019). The CDC’s website offers online literature, relevant studies and a variety of posters to further promote antibiotic stewardship. There is significant evidence to support the concern raised by the study’s physicians on the overuse of antibiotics nationally as well as globally. For example, a study in the British Journal of General Practice, the authors estimated that 80-90% of primary care visits resulted in antibiotic prescriptions. The study noted that the Royal College of General Practitioners (RCGP), which provides professional guidance in the UK, did not recommend antibiotics for patients with coughs, colds or viral sore throats. However, the study reported half of all patients who were seen for these common illnesses were prescribed antibiotics (Shallcross & Davies, 2014).

This area of concern among the participants may be the most important to note regarding health outcomes. Evidence shows that not only does over prescribing of antibiotics impact the patients for whom they are prescribed, but also those for whom they are not. From their perspective, over prescribing medication in effort to deliver *value* to a virtual visit is dangerous. The study participants state medications are a good thing. However, overuse or misuse of medication is not. Physicians of the study point to how worldwide, the potential for prescribing of unnecessary antibiotics is concerning. Superbugs result with the misuse of antibiotics. According to the CDC, resistance (bacteria) to drugs is making people sicker which carries the possibility of people being unable to be cured. The CDC drug resistance initiative site states that antibiotic resistance could potentially impact every American (Centers for Disease Control and Prevention, 2019). According to the physicians in this study, antibiotics definitely have their therapeutic benefits when providers agree to consider all aspects of care regarding their use. Virtual visits, according to the participants, may contribute to dilution of some of those benefits.

Benefits

Participants of the study perceive that virtual visits can benefit patient health outcomes as a result of better and more substantial learning and work opportunities for physicians themselves. Physicians are taught different philosophies and various treatment styles on how to practice medicine depending on where they receive their education. Physicians develop their own style of practicing medicine over time and with experience. Study participants believe that virtual visits can contribute to a physician's experiences as collaboration among physicians is made not only better, but at a faster rate. Although

physicians already communicate and conference among one another, several participants stated that virtual visits could enable physicians to immediately *visually* share cases that may not be the types of cases seen by their peers. The participants felt this is good for healthcare because physicians who engage in virtual visit collaboration gain a quick and valuable education. Exposure to cases uncommon to physicians in their respective practices was perceived as good for everyone.

Another area the participants cited as important, and where collaboration is beneficial, was among care coordination or triage. Half of the study participants perceive there is considerable value if, and when virtual visits are used as a triage mechanism. Virtual visit technology can provide added triage capacity which, according to several participants, leads to not only better patient outcomes but cost savings too. For example, when emergency medical services (EMS) are needed, EMS personnel are better able to access a physician who is at the local emergency room (ER). EMS personnel can perform the necessary field work while simultaneously contacting an ER physician. The ER physician can complete a more in-depth analysis of the situation, offer a diagnosis and provide a course of treatment which sufficiently stabilizes the patient. The ER physician can then direct EMS to proceed with either bringing the patient to the ER or to release the patient. The patient is then able to begin the prescribed treatment if an ER visit is not needed. In the event the patient must be brought to the ER, the ER personnel are prepared, equipped and ready for the patient as a result of the virtual coordinated care. Thereby virtual visit triage can save time, costs and resources for all involved. In a study which explored ambulance triage, researchers found that although it may cost more to equip ambulances with technology initially, the cost savings to an ER, human resources

and patient expenses would be compelling, and patient outcomes would also benefit (Espinosa et al., 2017).

Study participants felt there are several ways physicians could reinvent their jobs as a result of telemedicine. One physician stated the virtual visit concept could be an excellent way for a new physician to start and build a practice. The physician described the opportunity by saying, "a new physician [could] build clientele [from home], [they're] being paid for a virtual visit but their cost is lowered, no overhead." Also, physicians would now able to work outside the regular 8-5 workday hours if they choose to do so. The opportunity to provide care any time day or night is now possible with virtual visits. This is important for patient access since the US has different time zones. For example, a physician could be working at 8pm in the evening however, it is midnight for the patient seeking care. The patient could access care right away regardless of the hour and according to the study participants, access to a visit faster means access to treatment is faster. One participant stated, "typically when we see things earlier the treatments are more effective than [for] people that delay." The ability for physicians to work outside regular hours was perceived as a new and interesting opportunity for participants. One physician added cleverly, "[in the past], you had a physician come to the house with his stethoscope and bag, well now, the bag is my phone…I can get everything I need from it." Several physicians included that virtual visits may extend a physician's career. During retirement, a physician could still practice medicine from their home. One physician humorously devised a plan:

> you get a guy that's retired from practice and doesn't want an office anymore…he sits and waits on these virtual visits…he sees, diagnoses, starts treatment, follows

up, and if they’re not getting better, he refers them to someone else [in a traditional clinic].

V. DISCUSSION

Using the qualitative method grounded theory, I explored how physicians perceived virtual visits may impact health outcomes. Study results suggest the physicians perceive health outcomes will remain the same. Additionally, results suggest 100 percent of the physicians interviewed perceived the impact to healthcare would be beneficial to a degree however, much skepticism remained. After analysis of study results, I learned there is much to be addressed with the current healthcare system and traditional face to face visits before we progress too quickly to a virtual visit society.

I found that money greatly influences the US healthcare system and healthcare outcomes as a result. I did not anticipate finding, to the degree which I did, that money outside of healthcare is one of the greatest barriers between people and good health. The physicians I interviewed want to do so much more for patients and healthcare but money or profits, which they do not control, are a huge obstacle. I found that physicians genuinely want to spend more time with their patients and treating their illnesses. Physicians of this study were found to be dissatisfied with the administrative side of medicine. One hundred percent of the study participants addressed money and the impact it has on healthcare and health outcomes, and their concerns for healthcare overall as a result. Healthcare is a big and expensive business. Technology is also a big and expensive business and the physicians who provide healthcare services by means of technology are positioned directly between the two. I found when combining technology and medicine, the creators of technology and the policy makers of medicine share equal responsibility to contemplate the intangible costs of healthcare before profit. Money and payment should be less of a focus when it comes to healthcare. Before financial profits, if virtual visits are

to expand across the United States, healthcare gains should be studied carefully and purposefully. The participants of the study identified areas where change is necessary with the current virtual visit structure to potentially avoid further negative health outcomes. If we consider and include the perspectives from the physicians who provide healthcare, telemedicine's virtual visits will make sense and can indeed profit everyone.

The value of virtual visits and their use must be made clear. The real motivation behind appealing to the demands of society will dictate health outcomes. I found a decision must be made whether virtual visits are going to be treated a money-generators or better health outcome generators. There is a lot to be learned and considered from studies such as this as well as the studies referenced throughout the study. If societal demands include making healthcare more accessible and convenient by means of technology, then those who are in the position to aid its facilitation bear a huge responsibility to focus not only on technology's history of success but more so reflect and learn from its failures.

Overall, I found that in effort to maximize benefits to healthcare by means of a virtual visit, its implementation requires a bold commitment from patients, providers, healthcare organizations and the suppliers of technology. Patients will need to understand that perhaps some inconveniences, such as doctor visits, are well worth the inconvenience. While access to a provider is indeed improved with virtual visits, the quality of care could suffer without a fully credentialed licensed physician providing care on the other end. As suggested by the study, when it comes to healthcare and patient health outcomes, limited provider skill and knowledge can be dangerous. Failing to position the most skilled and highly trained provider for virtual visit care could prove to

be costly to us all. Healthcare organizations must consider the qualifications of the virtual visit provider hired to provide care. Profits cannot come at the expense of quality healthcare. I found that the credentials and experience of virtual visit providers can greatly impact health outcomes beyond just one visit. Providers with a lesser scope of care, less education and training can cause delays in care that result from ineffective decision-making and limited treatment opportunities. Providers with limited skill and knowledge could increase healthcare costs, not save them. And of course, the technology itself cannot be cost prohibitive to healthcare providers if the intention is to offer more and convenient healthcare choices to patients. As a result of listening to the study participants, they suggest the cost of virtual visit technology could be a barrier to its implementation. Physicians are typically perceived to be wealthy. However, study results suggest physicians struggle to be compensated for their knowledge and expertise just as often as other professionals do. Mismanagement of healthcare resources, both human and financial, affect everyone.

As I reviewed the results of studies which focused on virtual visit monetary gain, I reflected and found the providers who participated in this study are in a unique position and their perceptions are invaluable. Regardless of how much money influences healthcare and health outcomes, the physicians of the study remained focused on reaching successful patient outcomes. As indicated by the participants' responses, healthcare's virtual visit technology can assist many individuals with isolation issues and debilitating social issues receive necessary healthcare. When used thoughtfully, by means of technology, patients can overcome difficulties they believed were too great to conquer. Virtual visit access can give people the opportunity to sooner begin the healing process

and restore health when previously those opportunities were more difficult which is indeed beneficial. We learn from the study participants how society is better served when there is understanding that regardless of all the advances we have from technology, human relationships, the value of people, cannot be replaced nor should we try to replace them. The study results support that it is not beneficial to anyone to bypass the fundamental human to human connection in healthcare. This study benefitted from the strength that 100 percent of respondents, from their experience in healthcare, believe the capacity to personally connect with one another is too precious to abandon for the sake of convenience and profits. The study results found healthcare to be a delicate matter and suggests patient outcomes can improve via virtual visits of the future however, it behooves us to address the perspectives of the study's participants regarding virtual visits first.

Strengths and Limitations

This study found its strength by exploring not only the perceptions held by practicing physicians, but by also including their prior and current clinic experiences. The study was limited due to the small convenience sample size of participants. Future studies on health outcomes resulting from virtual visit use could include a larger sample size of participants and clinical measures.

Future Research

Further research is needed to explore how virtual visits may impact additional facets of healthcare. Exploration on the effect of virtual visits beyond health outcomes is encouraged among, but not limited to, the fields of health information technology,

healthcare administration and clinical laboratory research. Studies among these fields could provide comprehensive and timely results to inform, promote and facilitate a well-planned transition from traditional face to face healthcare visits to virtual visits.

VI. CONCLUSION

The theory which emerged from the data is that physicians rely on multiple factors, combined with their knowledge of medicine, to perform high level, comprehensive examinations on patients. The absence of any one of these factors will impact a physician's effectiveness and negatively impact health outcomes.

Several factors were identified as necessary during a patient encounter to complete a comprehensive examination, assist in sound decision making and achieve quality health outcomes. The factors identified included: the ability to perform a *hands-on* examination, the ability to personally connect with patients and establish a healthy doctor-patient relationship, the ability to review diagnostics, such as lab work and x-ray results, effective communication, and access to a complete patient medical history.

It is also evident that outside influences will shape physicians' attitudes about healthcare and how healthcare is delivered. I found that reimbursement to providers for a virtual visit, due to regulations, is below that of a traditional doctor visit. After analysis of the study's data pertaining to reimbursement, it is my observation that it is unlikely licensed medical doctors will choose to participate in virtual visit care beyond the follow up and courtesy care already provided for established patients. With the allure of access, convenience, and cost savings, virtual visits appear to be a good option for patients seeking healthcare. It is also reasonable to anticipate improved health outcomes will result from virtual visits however, I concluded otherwise. I found that filtered through technology, virtual visits restrict physicians from the ability to perform a comprehensive patient examination thereby limiting their capacity to achieve higher quality health

outcomes. I concluded that until virtual visit protocols are standardized, its reimbursement is adjusted to reflect the skill and knowledge of the provider of care, and the afore mentioned necessary factors are reconciled, patient health outcomes will likely remain unchanged.

APPENDIX SECTION

APPENDIX A

Recruitment Notice

The recruitment email/text read as follows; “Hello, this is Sylvia Benitez from the Health Information Department at Texas State University. I would like to invite you to participate in a 30-minute interview with me for a sponsored research study on how the increased use of telemedicine by physicians will impact long-term healthcare outcomes. This project was approved by the Texas State IRB on December 17, 2018. Questions or concerns pertinent about the research, research participants rights, and/or research-related injuries to participants should be directed to the IRB chair, Dr. Denise Gobert, 512-245-8351 (dgobert@txstate.edu) or to Monica Gonzales, IRB administrator, 512-2452314 (meg201@txstate.edu).”

APPENDIX B

Interview Questions

Interview questions were developed to gain perspectives from physicians so I could better understand how they perceived the increasing use of telemedicine in healthcare would impact health outcomes. Specifically, my study sought to understand provider views on how virtual visits might impact their specialty. I wanted to understand which barriers they perceived and what they suggest may overcome those barriers.

Interviews consisted of the following questions:

Q 1-What does the term telemedicine mean to you?

Q 2-Which telemedicine services does your clinic provide?

Q 3- What aspect of telemedicine interests you the most?

Q 4-What are your perceived benefits to healthcare outcomes when using telemedicine?

Q 5-What are your perceived disadvantages to healthcare outcomes when using telemedicine?

Q 6-How do you feel telemedicine can/may improve healthcare outcomes?

Q 7-How do you feel telemedicine can complicate long healthcare outcomes?

Q 8-How do you feel about the role of telemedicine and your specialty?

Any barriers you perceive and what adjustments (if any) would you make

APPENDIX C

IRB Approval

TEXAS STATE UNIVERSITY
SAN MARCOS
The rising STAR of Texas

In future correspondence please refer to 6235

December 17, 2018

Sylvia Benitez
Texas State University
601 University Drive.
San Marcos, TX 78666

Dear Sylvia:

Your IRB application titled "An exploratory study of physician perspectives regarding telemedicine and patient health outcomes" was reviewed and approved by the Texas State University IRB. It has been determined that risks to subjects are: (1) minimized and reasonable; and that (2) research procedures are consistent with a sound research design and do not expose the subjects to unnecessary risk. Reviewers determined that: (1) benefits to subjects are considered along with the importance of the topic and that outcomes are reasonable; (2) selection of subjects is equitable; and (3) the purposes of the research and the research setting is amenable to subjects' welfare and producing desired outcomes; that indications of coercion or prejudice are absent, and that participation is clearly voluntary.

1. In addition, the IRB found that you need to orient participants as follows: (1) signed informed consent is not required as participation implies consent; (2) Provision is made for collecting, using and storing data in a manner that protects the safety and privacy of the subjects and the confidentiality of the data; (3) Appropriate safeguards are included to protect the rights and welfare of the subjects. (4) Compensation will not be provided.

This project is therefore approved at the Exempt Review Level

2. Please note that the institution is not responsible for any actions regarding this protocol before approval. If you expand the project at a later date to use other instruments, please re-apply. Copies of your request for human subjects review, your application, and this approval, are maintained in the Office of Research Integrity and Compliance.

Report any changes to this approved protocol to this office. All unanticipated events and adverse events are to be reported to the IRB within 3 days.

Sincerely,

Monica Gonzales

Monica Gonzales
IRB Regulatory Manager
Office of Research Integrity and Compliance

CC: Dr. David Gibbs

OFFICE OF THE ASSOCIATE VICE PRESIDENT FOR RESEARCH
601 University Drive | JCK #489 | San Marcos, Texas 78666-4616
Phone 512.245.2314 | *fax* 512.245.3847 | WWW.TXSTATE.EDU

APPENDIX D

All 1st Cycle Code List

Distance, Separate, focus, hands on, face to face, see, concern, accuracy, settle, frustration, give up, understanding, laws, safety, diagnostic tools, money, payment, new, learning, possibilities, multi-task, multi-thinking, faster, access, treatment, indifferent, healthcare system, cost, technology, touch, communication, security, courtesy, second opinion, process, developing, convenience, future, concern, hope, difficulty, delay, diagnosis, urgency, triage, consideration, volume, wound care, confusion, anatomy, words, language, descriptions, experts, directions, compassion, equipment, setting, caution, errors, helpful, quicker, speed, fast, finance, expenses, youth, instant, too much, many steps, job, retirement, cell phone, limited, audio, video, age, legal, new patient, limited, visual, eyes/need to see, continuum of care, travel, home, freedom, unknown, delay, availability, reimbursement, exam, time, constraints, elimination, damage, difficult, signs, symptoms, health status, location, mistakes, guessing, knowledge, assumption, guess, inconvenient, simple, options, discussion, interview, portal, EMR, intentional, video, physical, cautious, misdiagnosis, listen, review, skill, training, bypass, sicker, worsen, loyalty, misleading, illness, incomplete, situational, specialty, medication, prescriptions, telemedicine, virtual visit, good, risk, codes, billing, policy, insurance, fixed, abuse, state law, regulations, business, corporate medicine, over medicate, schedule, conflict, familiar, relationship, outlook, history, established, work, stop, medical terminology, hands, understanding, license, credentials, supplemental, personal, evolving,

barriers, early, soon, education, fraud, verification, face time, in clinic, communication, familiarity, regulations, simple, reflection, chronic, acute, medication, coding, type of visit, doubt, unclear, presume, early, detection, peers, methods, delivery, differences, technique, time zone, work day hours, cold, impersonal, disconnected, fear, personal, status, science, medicine, teacher, comprehensive, monitoring, written, documents, self-care, self-treatment, palpable, investment, funding, value, alternatives, liability, doctor replacement, provider, collaboration, participation, priority, relationship, empathy, options, response, urgency, medical record, decision making, adequate, planning, precaution, advocate, family, data, stability, real, not real, habits, attractive, honesty, blind visit, reluctance, instinct, accreditation, validity, scripted, ineffective, inefficient, initial, common, unnecessary, patient history, breech, obstacles, failure, awareness, prohibitive, statistics, sabotage, risk, attitude, track, monitor

APPENDIX E

First Cycle Codes (paragraphs)

Q1	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
separate	X	X	X	X	X	X	X	X	X	X		X
distance		X				X	X		X	X	X	X
remote	X		X	X	X			X	X			X
No physical contact		X		X		X	X	X				X
Video Phone		X	X	X	X	X	X			X	X	
process			X									
Pt care treatment			X	X						X	X	

Second Cycle Coding

Category: Telemedicine. VV Meaning. Phones. Face time. Text. Fast. Access.

Theme: Exam

APPENDIX E (continued)

First Cycle Codes (paragraphs)

Q2	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
No new patients	X	X	X	X	X	X	X	X	X	X	X	X
Technology Phone	X	X	X	X	X	X	X		X	X	X	X
Difficult			X									
See		X	X									
Hands on		X	X									
Security Legal Policies		X	X			X			X		X	
Payment courtesy	X	X	X	X	X	X	X	X	X	X	X	X

Second Cycle Coding

Category: Telemedicine. VV current use. New. Use of technology as courtesy. Cell phones. Pt portal. Limited use. Skype. Face time.

Theme: Exam

APPENDIX E (continued)

First Cycle Codes (paragraphs)

Q3	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
Touch Hands on Listen	X	X		X		X						
see	X	X		X								
Doctor development		X				X	X	X	X	X	X	X
access		X				X						
No travel Freedom Time		X	X			X						
Exam				X								
Money Reimbursement					X							

Second Cycle Coding

Category: Interest. Concern. How to navigate the need to touch. Prescription mgmt. Chronic mgmt. More patients. See patients from anywhere. Future.

Theme: Provider

APPENDIX E (continued)

First Cycle Codes (paragraphs)

Q4	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
Better- sooner access	X	X	X	X	X		X			X	X	X
Knowledge- no improvement	X	X	X									
Hope		X	X						X			
Sooner- faster Treatment	X	X	X	X	X	X	X	X	X	X	X	X
Future		X	X				X				X	X
Not sure			X									
Prevention		X		X	X		X				X	

Second Cycle Coding

Category: Benefit. Positive view. Better due to faster treatment. Situational benefits. Chronic care mgmt.

Theme: Exam.

APPENDIX E (continued)

First Cycle Codes (paragraphs)

Q5	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
Accuracy	X	X		X	X							X
Concern Skill level of provider-knowledge	X	X	X	X	X							X
Misdiagnosis Touch See	X	X		X	X				X	X	X	X
Medical Record	X	X	X	X	X	X	X	X	X	X	X	X
Technology User	X	X		X	X			X		X	X	X
Delay		X	X	X	X		X					X
Reimbursement			X	X					X	X		X

Second Cycle Coding

Category: Disadvantages. Errors. Reimbursement. Complex Care. Regulations. Incomplete exam. Diagnostics.

Theme: Money. Exam. Provider

APPENDIX E (continued)

First Cycle Codes (paragraphs)

Q6	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
Access Convenience	X	X		X	X			X		X	X	X
Time to treatment	X	X	X	X	X		X	X	X	X	X	X
US Healthcare System			X									
Acute care	X			X		X	X					
Money Cost savings					X			X		X	X	X
Continued Care Follow up mgmt	X	X	X	X	X	X	X	X	X	X	X	X
No complex care												

Second Cycle Coding

Category: Improvements as a result of VV. Patients gain access to treatment sooner.

Theme: Exam. Provider. Reimbursement.

APPENDIX E (continued)

First Cycle Codes (paragraphs)

Q7	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
More to learn (codes) Billing	X	X		X						X		
Age		X	X	X		X						
Reimbursement	X	X		X		X	X			X		X
Examination Criteria		X	X	X	X			X			X	X
Not able to touch patient		X		X				X				X
Skill level of provider	X	X		X	X				X	X		X
Laws Regulations Policies	X			X	X			X	X	X	X	X

Second Cycle Coding

Category: Complications. Physicians perceive payment is lower although work is the same as in clinic visits. Misdiagnosis. Technology. Antibiotics. Prescription errors.

Theme: Exam. Money. Provider.

APPENDIX E (continued)

First Cycle Codes (paragraphs)

Q8	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
Quality patient care Med Term	X	X		X	X			X	X	X	X	X
Laws Regulations	X	X		X	X	X		X	X		X	X
Distractions Technology	X	X		X	X	X	X	X	X	X		
Touch patient for accurate DX	X	X	X	X	X	X	X	X	X	X	X	X
Good Better Ok			X	X	X			X	X	X		X
Not good No significant impact	X	X		X	X	X	X					X
No difference No opinion				X		X						

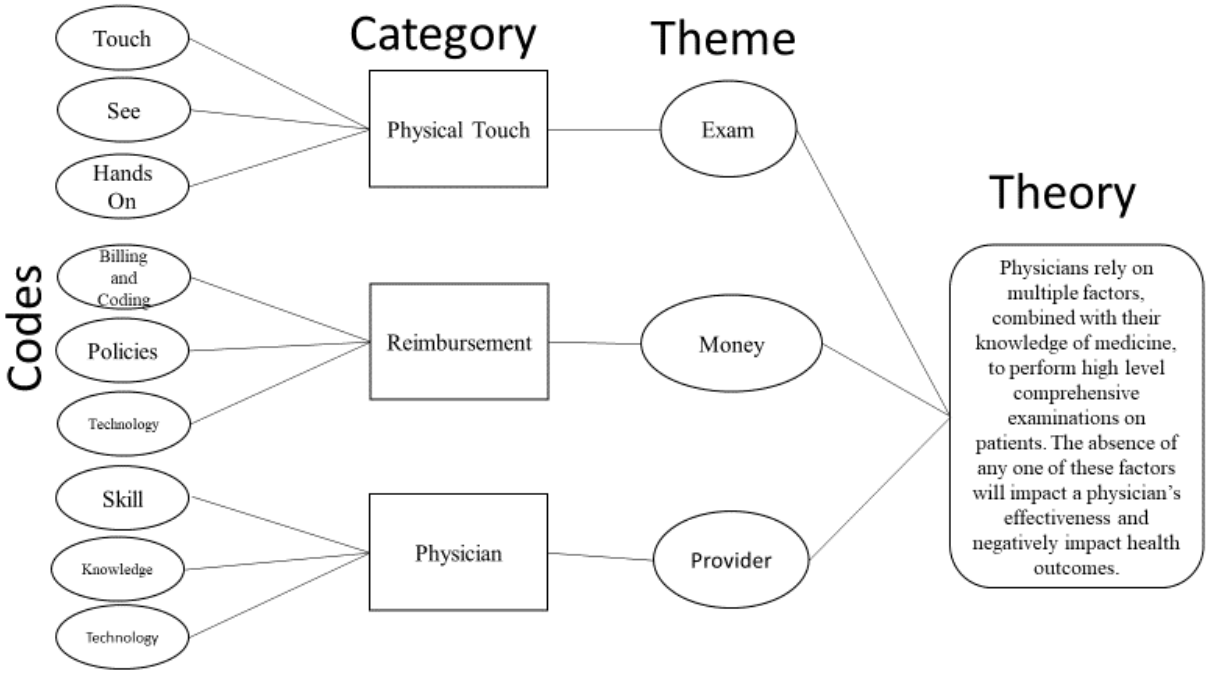
Second Cycle Coding

Category: Specialties. Not good for all visits- Detailed specialties. Heavy touch. Presumptions. Good for follow up.

Theme: Exam. Provider.

APPENDIX F

Codes and Resulting Theory



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