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TELEHEALTH AND REHABILITATION: EXTENDING OCCUPATIONAL THERAPY SERVICES TO RURAL MISSISSIPPI

Melody M. Burrage

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TELEHEALTH AND REHABILITATION: EXTENDING OCCUPATIONAL THERAPY SERVICES TO RURAL MISSISSIPPI

by

Melody M. Burrage

A Doctoral Project Submitted to the College of Education and Human Sciences and the School of Education at The University of Southern Mississippi in Partial Fulfillment of the Requirements for the Degree of Doctor of Education

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ABSTRACT

The purpose of this study was to assess healthcare providers’ perceptions, attitudes, and knowledge of occupational therapy telehealth services in rural areas of Mississippi. The results of the study have the potential to impact patients’ awareness of alternative methods to receiving occupational therapy and increase healthcare providers’ referral to occupational therapy telehealth services in rural Mississippi. Rural healthcare providers in Mississippi were surveyed. Of the 165 remote connections identified on the University of Mississippi Medical Center’s telehealth website, 48 were selected for the study. An additional eight healthcare providers were recruited through contact from the Mississippi Office of Rural Health. A 26-item survey was emailed to the selected 56 rural healthcare providers. A follow-up reminder email was sent three weeks after the initial email to remind participants to complete the survey. Of the identified 56 healthcare providers, 30 responded to the survey, a 54% response rate.

Three themes emerged from this research: telehealth practical usage, experience with telehealth, and occupational therapy telerehabilitation. Analysis of the responses indicated that nursing and rehabilitation therapists were more interested in learning more about telehealth. Nursing tends to use telecommunication equipment more frequently for patient care than other medical disciplines. The consensus of all healthcare practitioners was that telehealth can be beneficial in saving time and money, can increase access of healthcare for a continuum of care, and can improve the quality of care services in rural areas. The information derived from this capstone project can serve as a catalyst to increase the implementation of telerehabilitation services in rural Mississippi.
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DEDICATION

“To understand the world, you must first understand a place like Mississippi.”

-William Faulkner.
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LIST OF TERMS AND DEFINITIONS

American Telemedicine Association – (ATA) is an international telehealth advocacy organization providing education and advancing the telehealth policy, standards, and guidelines (American Telehealth Association, 2010).

Delta – The Mississippi State Department of Health coined the term the “Delta” to represent 18 counties lying in the northwest part of the state.

Occupation – “Daily life activities in which people engage. Occupations occur in context and are influenced by the interplay among client factors, performance skills, and performance patterns. Occupations occur over time; have purpose, meaning, and perceived utility to the client; and can be observed by others (e.g., preparing a meal) or be known only to the person involved (e.g., learning through reading a textbook). Occupations can involve the execution of multiple activities for completion and can result in various outcomes (AOTA, 2014)” (American Occupational Therapy Association, 2018).

Occupational Therapy – “The art and science of applying occupation as a means to effect positive, measurable change in the health status and functional outcomes of a client by a qualified occupational therapist and/or occupational therapy assistant (as appropriate)” (American Occupational Therapy Association, 2018).

Occupational Therapist – healthcare practitioner who “helps people across the lifespan participate in the things they want and need to do through the therapeutic use of everyday activities (occupations)” (American Occupational Therapy Association, n.d, para.2).
Telehealth/telemedicine – “The application of evaluative, consultative, preventative, and therapeutic services delivered through telecommunication and information technologies. Occupational therapy services provided by means of a telehealth service delivery model can be synchronous, that is, delivered through interactive technologies in real time, or asynchronous, using store-and-forward technologies. Occupational therapy practitioners can use telehealth as a mechanism to provide services at a location that is physically distant from the client, thereby allowing for services to occur where the client lives, works, and plays, if that is needed or desired (AOTA, 2013b)” (American Occupational Therapy Association, 2018).

Telerehabilitation – “is the application of telecommunication and information technologies for the delivery of rehabilitation services” (American Occupational Therapy Association, 2013a).

Store-and-forward – telehealth interaction that does not take place in real time (asynchronous) (Olson & Thomas, 2017; Movahedazarhouligh et. al, 2015).

Real-time interaction – interactions occurring in the present moment (synchronous) (Olson & Thomas, 2017; Movahedazarhouligh et. al, 2015).
CHAPTER I – INTRODUCTION

Consumers residing in rural and remote areas are at a significant disadvantage as it pertains to access to healthcare services. Hoffman and Cantoni (2008) alluded that the disadvantages were due to urbanization of health services, extended travel distances required to receive services, lack of transportation, and difficulty with recruiting and retaining healthcare providers. A survey conducted in 2013 indicated that 74% of American consumers would use telehealth services, 70% are comfortable with virtual communications with their healthcare providers, and 80% have no hesitation about submitting personal information online (Olson & Thomas, 2017). When planned and implemented correctly to suit the consumers’ needs, telehealth has a high favorability among consumers and healthcare providers. By 2020, virtually all employers will offer some healthcare benefits that will involve telehealth services for their employees (Tuckson, Edmunds, & Hodgkins, 2017).

Telehealth is defined as the remote delivery of a variety of healthcare and rehabilitative services for persons with physical and cognitive disabilities and medical conditions through telecommunication technology via an array of interfaces (Forducey et al., 2003). Medical conditions and specialties often seen utilizing telehealth and associated practices at the University of Mississippi Medical Center, includes but is not limited to: Alzheimer’s/dementia care, allergy/immunology, cardiology, corporate health, dermatology, e-Intensive Care Unit, emergency medicine, endocrinology, infectious diseases, mental health services/psychology, nephrology, retinal exams, obesity and wellness, obstetrics/gynecology, radiology, trauma, urgent care, wound care, various pediatric services, neonatology and urology (UMMC Healthcare, 2018).
Tuckson, Edmunds, and Hodgkins (2017) emphasized that telehealth can be implemented in various areas of healthcare with positive outcomes and benefits. To demonstrate how universal telehealth practicality can be, the following areas have shown to be appropriate and relevant:

- real-time video consultations with off-site specialists in fields such as cardiology, dermatology, psychiatry and behavioral health, gastroenterology, infectious disease, rheumatology, oncology, and peer-to-peer mentoring; telephone, e-mail, and video visits for primary care triage and interventions such as counseling, medication prescribing and management, and management of long-term treatment for diabetes, chronic obstructive pulmonary disease, and congestive heart failure; technologies for transferring imaging data for off-site radiologic review; hospital-based services, such as emergency and trauma care, stroke intervention, intensive care, and wound management, that are supported by specialty consultations through videoconferencing and securely transmitted high-resolution images; post discharge coordination and management of chronic and other illnesses in home and community-based settings, supported by remote monitoring capabilities, improved resolution of smartphone cameras, and growing consumer familiarity with video interactions; and wellness interventions, in areas such as health education, physical activity, diet monitoring, health risk assessment, medication adherence, and cognitive fitness, that use video channels, smartphone apps and texts, and Web portals. (p. 1586)
The arguments offered by Tuckson, Edmunds, and Hodgkins (2016) pertaining to the appropriateness of telehealth within medicine is in alignment with fellow researchers.

Background

Telehealth is used interchangeably with telemedicine or telerehabilitation and has been characterized as the use of medical information that is shared between sites via electronic communication to improve a patient’s health (Tuckson, Edmunds, & Hodgkins, 2017). Additionally, telehealth is a generic term that includes specialty areas such as “e-health, telemedicine, telematics, and telerehabilitation” (Movahedazarhouligh, Vameghi, Hatamizadeh, Bakhshi, & Khatat, 2015, p.1). The World Health Organization (2010) further defines telehealth as the delivery of healthcare services, with location being a critical factor, by all healthcare professionals using information and communication technologies for the exchange of relevant information to diagnose, treat, and prevent disease and injuries, research and evaluate, and for continuing education of healthcare providers in the interests of advancing the health of individuals and their communities.

Telemedicine

The American Telemedicine Association (ATA) describes telemedicine as a general term that refers to the “use of medical information exchanged from one site to another via electronic communication to improve patients’ health status” (Cason, 2012, p. 132). Telemedicine is unique in that healthcare practitioners are able to use telecommunication technology to connect with patients who do not have or have very limited access to local healthcare services (Ayatollahi, Sarabi, & Langarizadeh, 2015).
Telehealth

Telehealth is a broad concept encompassing many aspects of healthcare being delivered using telecommunication technology (Richmond & Cason, n.d.). In some instances, telehealth is discussed as a modernized trend that has advanced considerably over the past 30 years. An expanding number of interventions are utilizing technologies to deliver health services at a distance rather than engaging in a face-to-face delivery model (Standing, Standing, McDermott, Gururajan, & Kiani Mavi, 2018). Adelphi University (2019) explored the telehealth market and discovered that there were five recent advancements in telemedicine and health IT: the advancements were wearable medical devices, smartphones as diagnostic tools, health informatics, digital therapy and advice, and new applications. The researchers at Adelphi University indicated that these five advancements have shown effectiveness in reducing financial obligations while saving time.

Olson and Thomas (2017) indicated that telehealth originated as early as the mid-1800s when the telegraph and the telephone were invented; furthermore, telecardiology has been noted to have occurred as early as the mid-1920s, when the telephone was used to send heart rhythms between physicians located in remote locations. Baumann and Scales (2016) argued that the exact date in which telehealth was first used for medical interventions has been debated and some historians describe the first example of telehealth as occurring in the late 1950s and early 1960s in Nebraska. More specifically, between 1959 and 1964, the Nebraska Psychiatric Institute in Omaha collaborated with the Norfolk State Hospital to develop the first interactive video link that allowed medical professionals to provide medical services over the 112-mile radius distance between the
two facilities (Iafolla, 2018). Schleicher (2015) described in detail how University of Nebraska Medical Center (UNMC) became a pioneer in telemedicine. Furthermore, the foundation established by UNMC made it possible for the collaboration between the Nebraska Psychiatric Institute and the Norfolk State Hospital. The former Nebraska Psychiatric Institute was under the leadership of Dr. Cecil Watson, MD, when he first proposed the utilization of the Bell Telephone Company to share weekly lectures of the psychiatric institute to individuals nationally and with four other mental hospitals in different states (Schleicher, 2015). Bashshur and Shannon (2009) describes the time frame from 1955 to 1972 as the “pioneering period” for telemedicine.

Even among historians and researchers, consensus has yet to be reached as to an accurate time frame or the level of complexity in which telehealth has been in existence. However, it is apparent that the development of telemedicine has been a continuous process in which additional services have continually been added to existing systems and technologies. Despite the lack of agreement regarding the timeline of telehealth, historical accounts have been documented. Currently, over 52% of hospitals use some form of telehealth and roughly 10% had begun to implement telehealth by the year 2013 (Olson & Thomas, 2017). In addition, the internet and mobile technology have facilitated telehealth to the forefront of healthcare in recent years as technology has advanced and the costs associated with medical services have increased. Historically, telehealth has been used primarily in rural areas to extend healthcare services to communities either by a physician or nurse; however, a multitude of other healthcare providers are exploring ways to utilize this mode of delivery within their professions (Calouro, Kwong, & Guiterrez, 2014).
Telerehabilitation

Telerehabilitation is a segment of telehealth. The term telehealth encompasses both telemedicine and telerehabilitation; furthermore, telehealth refers to the utilization of electronic information and telecommunications technology to provide health-related services over a specified distance (Cason, 2012). Telerehabilitation is the “application of evaluation, preventative, diagnosis, and therapeutic services via two-way or multi-point interactive telecommunication technology” (Cason, 2012, p. 132).

Statement of Problem

Providing healthcare to rural areas has been problematic for years. With the increased use of technology being incorporated into healthcare, administering healthcare services to these remote locations through technology may be a solution to the problem. In addition, healthcare providers are also looking for ways to manage costs while providing effective healthcare services and extend healthcare services to rural locations. The 2010 Census indicates that 19.3% of the United States’ population live in rural areas. Consumers and institutions are spending millions of dollars on services related to readmission and multiple hospitalizations within rural areas. With the growing use of telehealth, many states and institutions are recording success in offering healthcare services to isolated and rural areas. In the state of Mississippi, telehealth has played a key role in increasing access to the rural areas of Mississippi by offering much-needed healthcare services in locations with few or no medical specialties (UMMC Healthcare, 2018). Telehealth appears to be an option for extending healthcare to remote and inaccessible areas in Mississippi. With evidence of success with increasing healthcare in various medical disciplines, telehealth can also be a viable option for extending
occupational therapy services to rural areas. Similar to other medical disciplines, occupational therapy services are also limited in rural areas and healthcare providers are not knowledgeable as to how occupational therapy can provide relief to their patients’ underlying impairments or deficits.

**Healthcare in Mississippi**

Mississippi has been known to have one of the poorest healthcare rankings in the United States, according to Pittman (2015). In addition to high rates of obesity, diabetes, cancer deaths, and infant mortality, Mississippi has the highest physician shortage in the country and continues to worsen (Pittman, 2015). In a recent study that analyzed the financial stability of 2,045 rural hospitals throughout the country, it was revealed that “Mississippi had more rural hospitals at risk for closing” than any other state; where, 48% of the rural hospitals in Mississippi are at risk for closure compared to the national rate of 21% (Campbell, 2019). Approximately 12% of Mississippians lack healthcare insurance, a majority of whom reside in rural Mississippi. With the limited resources and healthcare practitioner shortage, the saturation of uninsured individuals in rural areas increases the strain on the hospitals servicing the areas. This report also indicates that approximately 60% of trauma deaths occur in rural parts of the country and that figure could increase if the resident must travel longer distances to receive healthcare (Campbell, 2019). Also, after experiencing a medical episode, therapy is usually prescribed for regaining of strength and function. Thus, medical intervention and physical medicine rehabilitation are a continuum for achieving optimal health and recovery.

Campbell (2019) indicates that several of the medical facilities located in rural Mississippi are independently operated while others are associated with The University
of Mississippi Medical Center (UMMC). Mississippi has only two medical schools: The University of Mississippi Medical Center in Jackson, Mississippi and William Carey University in Hattiesburg, Mississippi. The University of Mississippi Medical Center, Doctor of Medicine medical school, has remote connections to 165 sites across the state, making Mississippi’s telemedicine program one of the top seven in the United States (Pittman, 2015). The Doctor of Osteopathic Medicine medical school at William Carey University has taken action to train and supply the rural areas of Mississippi with qualified physicians. However, UMMC has taken a predominant role in extending telehealth to consumers in rural Mississippi. Services are being offered in community hospitals, local clinics, health centers, K-12 schools, colleges, businesses, prisons and correctional centers, and nursing homes; furthermore, the University of Mississippi Medical Center extends services to 69 out of 82 counties within Mississippi with 35 medical specialties being offered (UMMC Healthcare, 2018).

The services being offered through UMMC for adults include Alzheimer’s/Dementia Care, Allergy/Immunology, Cardiology, Corporate Health, Dermatology, eICU, Emergency Medicine, Endocrinology, Infectious Diseases, Mental Health Services, Nephrology, Obesity and Wellness, Obstetrics/Gynecology, Ophthalmology, Psychiatry, Psychology, Radiology, Trauma, Urgent Care, and wound care. Services being offered to children include Cardiology, Child Development, Child Maltreatment Services, Emergency Medicine, Genetics, Neonatology, Neurology, Psychiatry, Psychology, and Urology. Ancillary services include pathology, remote telemetry, retinal exams, radiology, and remote monitoring of at-home patients (UMMC Healthcare, 2018). Despite offering a moderate number of specialties, the coverage
continues to be limited and some counties do not have access to all the available specialties. The primary offerings appear to be adult and pediatric cardiology, mental health, and emergency medicine (UMMC Healthcare, 2018). UMMC is the only academic institution responsible for training registered occupational therapists in the state of Mississippi; however, they do not actively endorse occupational therapy telerehabilitation. The specialties currently supported at the academic institution involve either a physician, nurse, or x-ray/medical technician, as indicated on their telehealth website.

This capstone project seeks to explore rural Mississippi healthcare practitioners’ perceptions and knowledge of occupational therapy telehealth. The current service delivery model, when available, in which occupational therapy is being offered is through direct face-to-face interaction. Offering occupational therapy or segments of occupational therapy through telecommunication is not an option at this time in rural Mississippi. The availability of occupational therapy services by telehealth could lead to a comprehensive interdisciplinary approach to patient care in rural areas of Mississippi.

**Occupational Therapy**

Occupational therapy is one of three rehabilitation disciplines whose primary focus is to educate and restore a person’s ability to function with daily activities to the highest level of independence. The American Occupational Therapy Association (AOTA) (n.d.) states that occupational therapy is the only profession that supports individuals across the lifespan to help them engage in daily activities and tasks of their choice. Within the field of occupational therapy, these daily activities or tasks are interchangeably referred to as *occupations*. Occupations may be “characterized as being
meaningful and goal-directed but not necessarily considered by the individual to be of central importance to her or his life. . . . [and] may be viewed as (1) activities in which the client engages, (2) activities that have the added qualitative criteria of giving meaning to the person’s life and contributing to his or her identity, and (3) activities the individual looks forward to engaging” (Pendleton & Schultz-Krohn, 2018, p. 5). The primary goal of occupational therapy practitioners is to enable people of all ages to “live life to its fullest,” a phrased coined by The American Occupational Therapy Association, by helping them promote health, and prevent—or live better with—injury, illness, or disability while engaging in their desired occupation at the highest level of independence (AOTA, n.d.). According to Clark et al. (1991), participation in occupations has been shown to “significantly relate to multiple outcome variables such as health, self-esteem, social competence, happiness, and satisfaction with life” (p. 306).

The standard occupational therapy process includes “an individualized evaluation, during which the client/family and occupational therapist determine the person’s goals, customize intervention to improve the person’s ability to perform daily activities and reach the goals, and an outcomes evaluation to ensure that the goals are being met and/or make changes to the intervention plan” (AOTA, n.d.). These practices are implemented with a holistic approach that also involves modifying or adapting the environment to accommodate the person and caregivers. The practices offered by the occupational therapist are evidence-based practices that can be supported by science (AOTA, n.d.). Occupational science is a “scientific discipline that is defined as the systematic study of the human as an occupational being” in which the individual’s primary focus is to
actively pursue and orchestrate occupations throughout their lifespan (Clark et al., 1991, p. 300).

**Occupational Therapy and Telerehabilitation**

Notable areas of occupational therapy heavily influenced by the use of telehealth include:

- wheelchair prescription,
- neurological assessment,
- adaptive equipment prescription and home modification,
- ergonomic assessment,
- school-based practice,
- early intervention services,
- health and wellness programming,
- and rehabilitation for individuals who have experienced stroke, breast cancer,
- traumatic brain injury, polytrauma, Parkinson’s disease, and other neurological and orthopedic impairments. (Cason, 2014, p. 29)

Telehealth has played a key role in increasing healthcare and rehabilitation access to rural areas for many years but has yet to reach saturation in some areas (Standing, Standing, Mcdermott, Raj, & Reza, 2018). Mississippi is one of those areas that could benefit from this service delivery model.

With the rise of various modes of telecommunication devices and technology, the potential for physical, occupational, and speech therapy to expand its services to remote locations appears to be positive. Upon assessing the community’s needs and desires to receive these services, the information can be used by colleges and universities, government agencies, rehabilitation companies, insurances, and other healthcare providers to change policies to make these services available to consumers.
Purpose Statement

The purpose of this research study was to understand healthcare providers’ perceptions, attitudes, and knowledge of occupational therapy being offered via telehealth services in rural Mississippi and to identify the potential barriers and challenges for extending occupational therapy services in these areas through telecommunications. This study examines how receptive healthcare providers in rural Mississippi are towards referring patients to occupational therapy telerehabilitation services, when appropriate. Furthermore, this study can have indirect impact on patient care as it can facilitate a continuum of care, aide in managing chronic healthcare conditions, and reduce the time and cost typically incurred from the standard brick-and-mortar practices.

This research will provide foundational data to understand how well occupational therapy telehealth services would be accepted and welcomed in rural Mississippi as a way to expand occupational therapy services to inaccessible or isolated locations. The primary research questions were:

1. What are clinicians and other healthcare providers’ perceptions, attitudes, and knowledge of occupational therapy telehealth services?
2. How receptive are healthcare providers in rural areas in the state of Mississippi towards referring their patients to occupational therapy rehabilitation services through telehealth?

This research study has the potential to indirectly impact educational practices, extending healthcare coverage, and policy-making. Furthermore, information gathered from this research may provide the foundation for future research to assist in managing rehabilitation costs as the rural areas have less access to financial resources. Also, other
benefits of this study include: provide insight to continuous rehabilitation services after an acute episode or for managing chronic medical conditions, increase patients’ and caregivers’ knowledge through educational training, and educate academic programs to modify curriculums to prepare future therapists and healthcare providers as they strive to meet the needs of the population they will serve.
CHAPTER II – LITERATURE REVIEW

The advancement in technology coupled with the need to extend healthcare services to rural areas has prompted the development of various models and modes to patients who would not ordinarily have access. In particular, occupational therapy practitioners and other therapy providers are devising alternative ways to offer evaluation, consultation, preventative procedures, and therapeutic services through telecommunication and information technologies (American Occupational Therapy Association, 2013a). According to Olson and Thomas (2017), “the combination of consumer demand, technological advances, and practice demands for efficiency is increasingly moving telehealth into the mainstream” (p. 348). Recent literature advocates that telehealth can be an effective and efficient delivery model for both medical and allied healthcare practitioners (Barlow, Liu, & Sekulic, 2009; Olson & Thomas, 2017). Tuckson, Edmunds, and Hodgkins (2017) believe the top five trends that will influence the growth of telehealth services are:

(1) continuous innovation in the consumer technology market, which will continue to attract financial capital for product development; (2) continuous advancement in electronic health records and clinical-decision support systems, which has the potential to better integrate telehealth services into care-delivery processes and thus make care delivery more efficient for clinicians; (3) projected shortages in the health professional workforce, which will increase the need to provide access to primary and specialty care for rural and underserved urban populations; (4) reorganization in the delivery and financing of medical
care, as a result of private-sector initiatives and the Affordable Care Act, toward value-based reimbursement, which provides an incentive for service delivery in lower cost care settings outside of traditional hospital facilities; and (5) growth of consumerism in healthcare, with increasing public expectations for convenient and real-time access to health services, personal health information, prescription refills, and other health interventions in a manner similar to other sectors of the economy.

(p. 1586)

Current trends show an increase of telehealth services by 52% of hospitals within the United States with usage steadily increasing the expansion of healthcare services to rural and underserved populations. Using a combination of the top five trends can further increase the utilization of telehealth services in rural areas.

History

In 1876, Alexander Graham Bell patented the telephone and began the telecommunication movement. Several decades later in 1924, Dr. Hugo Gernsback coined the term “teledactyl,” which consists of having robotic fingers with video that allowed for the ability to examine patients from an extended distance (Iafolla, 2018). Less than thirty years later, beginning in the 1950s, medical personnel began using closed circuit television. During the initiation of telerehabilitation, between the 1900s and 1940s, rehabilitation specialists relied heavily on the use of “telephone, radio/telegraph, and closed-circuit television” to communicate with patients (Jafni, Bahari, Ismail, & Radman, 2017). The improvement with technology occurred around the 1960s with a combination of “television, satellite, and visual pre-recorded video to deliver video conferences with
patients” (Jafni, Bahari, Ismail, & Radman, 2017, p. 453). In 1964, picturephone was the first example of videochat and was invented by AT&T; this innovation allowed for transmitting of video over telephone lines (Iafolla, 2018). Baumann and Scales (2016) noted that NASA used telehealth to monitor astronauts’ physiological data while in space (i.e., when geographic barriers prevent immediate access to services). Furthermore, it was in 1967 that Boston’s Logan Airport and Massachusetts General Hospital established a telemedicine system constructed upon the use of an interactive television and the transmittal of patient data to physicians at a remote location to facilitate the diagnosis of patients (Nestor, 2001).

In the late 1960s and early 1970s, the United States federal government provided financial support for telemedicine projects, several of which were in rural areas to determine if telemedicine was the solution to providing the access to healthcare in rural locations (Baumann & Scales, 2016). Between the early and mid-1970s, Space Technology Applied to Rural Papago Advanced Healthcare (STARPAHC) program consisted of NASA partnering with Indian Health Services to provide remote healthcare to the Papago Indian Reservation; furthermore, x-ray machines allowed for medical record results to be transmitted via two-way microwave to nearby hospitals (Iafolla, 2018). By the early 1980s, NASA carried out its first international telemedicine project in Armenia and in 1989, the first patient was defibrillated by telephone. As early as 1993, The American Telemedicine Association (ATA) was created to facilitate an increased quality of resources, standards, and legislation for telemedicine (Iafolla, 2018). Widening its exposure to the mass population to extend healthcare coverage, Medicare began to use this new service model of healthcare. In 1999, Medicare started paying for telehealth
consultation services for patients who reside in underserved rural areas. According to Jafni, Bahari, Ismail, and Radman (2017), telerehabilitation technologies became more advanced in the 2000s with the use of the Internet with high-speed wireless capabilities. Approximately 10 years later, the American Recovery and Reinvestment Act (ARRA) assisted in expanding telemedicine by offering health information technology. From 2010 until the present, telehealth has continued to grow tremendously, and multiple avenues are being created to improve healthcare coverage, decrease healthcare cost, and provide effective and convenient means for patients and their families to receive healthcare (Iafolla, 2018).

Service Delivery Models

Telehealth is a service delivery model, which the American Occupational Therapy Association defines as “the application of evaluative, consultative, preventative, and therapeutic services delivered throughout telecommunication and information technologies” (Cason, 2014, p. 29). The occupational therapy practitioner, the healthcare provider, must “determine if there are prescriptive telehealth laws, regulations, or policies in the state wherein the practitioner is located at the time of service and the state wherein the client is located at the time of service” (Cason, 2014, p. 30). The means and manner in which telehealth is administered is determined mostly at the state level whereas federal laws typically monitor the prescription of controlled substances under the Ryan Haight Act of 2008 (Breuer et al., 2018). While it is necessary to follow federal government guidelines, it is mostly up to the state to determine what types of service delivery models should be implemented through telehealth. In addition to adherence to the laws, it is crucial that the delivery of occupational therapy meets the “Health Insurance Portability
and Accountability Act (HIPPA) and the Health Information Technology for Economics and Clinical Health Act requirements for privacy, security, and confidentiality of protected health information” (Cason, 2014, p. 30).

Telerehabilitation is categorized and practiced in three broad categories: store-and-forward mode, real-time interactions, and hybrid mode (Movahedazarhouligh et. al., 2015). First, the store-and-forward mode involves the storing and saving of information for future retrieval. For example, an MRI can be conducted on a patient at a specific location and saved as an electronic file for another healthcare provider to access in a different location. Real-time interactions indicate “live interactions” between the consumer and the healthcare provider. A real-time interaction may involve a video conference in which the physician communicates with the consumer and asks the consumer to perform specific tasks and movements. Lastly, the hybrid mode is a combination of the real-time interactions and store-and-forward modes referenced above (Movahedazarhouligh et. al., 2015).

Additionally, the three categories can be subdivided into two groups: synchronous and asynchronous. Synchronous service models offer the exchange of health information in real time or “live” between the patient and the healthcare practitioner using interactive audio and video (Breuer et al., 2018). This is most often via videoconferencing through voice over the internet protocol (VoIP), mobile videoconferencing, plain old telephone service (POTS), videoconferencing, high-definition television (HDTV), telehealth network with commercial videoconferencing system, and virtual reality (VR) technologies with live-streaming data to remote practitioners (American Occupational
Therapy Association, 2013). Breuer et al. (2018) indicate that this option, synchronous, is preferred during urgent situations or when the patient is unable to travel.

The alternative to synchronous technologies when offering telehealth services is the use of asynchronous technologies. Moreover, the asynchronous service delivery model is referred to as “store-and-forward” data transmission in which the healthcare provider is located at a remote location from the patient at the time of service (Breuer et al., 2018). Examples of asynchronous technologies in which the occupational therapy practitioner offers telehealth include video recording devices, cameras for photographs, devices enabling electronic communication, and VR technologies. Services that can be either synchronous or asynchronous are telemonitoring technologies that involve home monitoring systems, devices with wireless sensors, and VR technologies that include remote use of VR systems or devices (American Occupational Therapy Association, 2013a & 2013b). Breuer et al. (2018) suggest that the asynchronous model is preferred when immediate feedback is not critical or possible. The asynchronous model is especially favored when cost management is considered as this delivery model is less expensive than “services provided in the traditional setting” (p. 45).

The most often prescribed technologies used by occupational therapy rendering telehealth services are: 1) textual-based technologies like e-mails, 2) audio-based (voice/sound) technologies like video conferencing, 3) virtual reality like computer games and avatars, 4) web-based technologies like real-time chatrooms and discussion boards, 5) wireless technologies like PDAs (Personal Digital Assistants) and GPS (Global Positioning Systems), and 6) integrated systems like robots. These communication models are a combination of real-time video and store-and-forward
methods (Movahedazarhouligh et al., 2015). Teleconsultation, telemonitoring, and the use of technologies for supervising occupational therapy students during rotations/fieldwork are three primary methods for occupational therapy practitioners to use telehealth models to extend services to rural and underserved populations and areas throughout the United States (American Occupational Therapy Association, 2013a & 2013b; Cason, 2014). Rush et al. (2018) concluded, from a systematic review regarding the efficacy of telehealth delivered educational approaches, that while web-based technologies are common, no particular technology emerged to be superior than the others.

Training for Telehealth Providers

The Department of Health and Human Services estimates that more than 60% of all healthcare institutions and approximately 40 - 50% of all hospitals within the United States utilize a model of telehealth (Tuckson, Edmunds, & Hodgkins, 2017). After the implementation of a secure and cutting-edge infrastructure platform that meets federal and state guidelines and is capable of protecting patients’ privacy and confidentiality, healthcare providers must receive training for telehealth models to be carried out successfully. Healthcare providers should receive highly specialized training to implement the technology and learn how to manage the unique issues and challenges not associated with the standard brick-and-mortar practices. Some of the concerns these healthcare providers must be trained to assess and solve includes but are not limited to: “appropriate clinical environment, state and federal regulations, the telehealth history and physical exam, referral practices, and emergency procedures” (Empowering Patients with Telehealth, 2016, p. 13). Because technology advancement is continuous and can become
outdated very quickly, healthcare providers must be aware of practices that allow them to adapt their practice efficiently and effectively to meet patients’ needs and respond the evolving dynamics of telehealth. Olson and Thomas (2017) argue that training and implementing new technology has the potential to increase the cost of operating a telehealth program.

According to the white paper produced by American Well and Deloitte Consulting LLP, the level of training healthcare providers must continually engage in includes the following categories: “provider training/oversight; developed clinical oversight process; robust quality management program; individual clinical practice training to cover prescribing policies, emergency care protocols, and referral practices for both in-person and telehealthcare; clinical protocols for individual telehealth use cases and diagnosis along with associated workflows; general computer skills tutorial to acquaint providers with the tools needed to effectively provide care using technology; training on video conferencing skills and ‘website manner’; and ongoing or periodically scheduled training to address clinical/technology updates” (Empowering Patients with Telehealth, 2016, p.13). Depending on the discipline and the complexity of services being provided, the required training may vary slightly. Consistency between facilities and patients during the facility rollouts is key to the success of telehealth practices.

Legality and Regulation

Healthcare practices are monitored and controlled through laws and regulations established at the state and national levels. The National Institute on Disabilities and Rehabilitation Research created a Rehabilitation Engineering Research Center for Telerehabilitation in 1998; the purpose was to “support research and development of
rehabilitation consultation, assessment, monitoring, and intervention at a distance” (Wakeford, Wittman, White, Schmeler, & Brayman, 2005, p. 658). Nationally, standards are set forth by the Centers for Medicare and Medicaid Services (CMS), The Joint Commission (TJC), and the Affordable Care Act determine the scope in which healthcare agencies and facilities must abide (Olson & Thomas, 2017). As of 2016, the list of CMS approved telehealth providers included physicians, nurse practitioners, physician assistants, nurse midwives, clinical nurse specialties, certified registered nurse anesthetists, clinical psychologists, clinical social workers, and registered dieticians/nutrition professionals (Olson & Thomas, 2017).

On a local level, the state enacts laws regulating medical practice and health insurance, including Medicaid. It is up to the state to determine how much focus and investment will be put into advancing telehealth practices, i.e., financial and regulatory (Olson & Thomas, 2017). Since the majority of governance resides at the state level, the location of the patient and healthcare provider is critical when determining qualification for coverage, cost, and payment. Thus, it becomes necessary for healthcare providers to understand the laws in the state in which they provide telehealth services. In addition, occupational therapy and other healthcare practitioners must comply with licensure laws and state regulations for their respected practices (Wakeford, Wittman, White, Schmeler, & Brayman, 2005).

As referenced above, occupational therapy healthcare providers are devising ways to implement telehealth to areas experiencing a shortage of therapists. Cwiek, Rafiq, Qamar, Tobey, and Merrell (2007) agree that occupational therapists must abide by the laws and regulations established by the respected state when implementing the telehealth
service model within occupational therapy. The full implementation of the Patient Protection and Affordable Care Act (PPACA) calls for an increase in demand for allied healthcare professionals to extend telehealth practices and meet the increased demand (Calouro, Kwong, & Guiterrez, 2014). Researchers have discovered that 46 states lack telehealth laws and regulations that apply specifically to physical, occupational, and speech language pathology. Furthermore, of the five states that have identified guidelines, their approaches tend to differ significantly as indicated below (Calouro, Kwong, & Guiterrez, 2014).

The following five states have specific rules and regulations pertaining to occupational therapy and telehealth: Alaska, California, Colorado, Illinois, and Kentucky (Calouro, Kwong, & Guiterrez, 2014). Alaska has a law or regulation regarding the use of telehealth to render occupational therapy services and requires the therapist be physically located in the state where services are being provided. California requires occupational therapists obtain informed consent at the remote location, and regulations also exist for professionals to determine whether in-person evaluation or intervention is necessary (Calouro, Kwong, & Guiterrez, 2014). In general, most states’ physical and occupational therapy regulatory boards have not been active on telehealth-related concerns; furthermore, few states provide limited guidance and hold occupational and physical therapists to the same standard of care regardless if the services are provided in-person or via telehealth (Calouro, Kwong, & Guiterrez, 2014). According to Calouro, Kwong, and Guiterrez (2014), Alaska, Kentucky, and California have more detailed criteria for occupational and physical therapists to offer rehabilitative services via telecommunications. Some critics indicate that the specific and restrictive laws and
regulations pose more of a barrier to inhibit the use of telehealth, as the standards are above and beyond the standard of care (Calouro, Kwong, & Guiterrez, 2014).

As indicated above, Mississippi has limited restrictions and guidelines as it pertains to the utilization of telehealth to offer occupational therapy services. However, Mississippi’s physical therapy administrative code incorporates telehealth within the definition of “practice of physical therapy” setting by capitulating the following: “Telehealth is an appropriate mode of service delivery when it is provided in a manner consistent with the standards of practice, ethical principles, rules and regulations for Mississippi physical therapy practitioners” (Calouro, Kwong, & Guiterrez, 2014, p. 19).

Unlike some states, the state of Mississippi does not impose any standards beyond the normal standard of care on telehealth use in therapy. More specifically, Mississippi does not offer statutes or regulations specific to occupational therapy and telehealth, but other statues allow for occupational therapy providers to implement telehealth services (AOTA State Affairs Group, 2018). According to the AOTA State Affairs Group (2018) compilation of state statutes and regulations, Mississippi offers the following:

TITLE 41. PUBLIC HEALTH CHAPTER 127. TELEMEDICINE SERVICES § 41-127-1. Licensed healthcare practitioners authorized to provide healthcare services via electronic means; standards of practice subject to the limitations of the license under which the individual is practicing, a healthcare practitioner licensed in this state may prescribe, dispense, or administer drugs or medical supplies, or otherwise provide treatment recommendations to a patient after having performed an appropriate examination of the patient either in person or by the use of
instrumentation and diagnostic equipment through which images and medical records may be transmitted electronically. Treatment recommendations made via electronic means, including issuing a prescription via electronic means, shall be held to the same standards of appropriate practice as those in traditional provider-patient settings. (p. 10)

The AOTA (2013b) encourages occupational therapy practitioners to directly contact each state’s regulatory board to obtain written permission; furthermore, the policies and guidelines of the payers should be examined for compliance. Usually, this information can be located on the state licensure boards’ websites (AOTA, 2013b).

Financial Support and Reimbursement

Olson and Thomas (2017) argue the importance of the costs, benefits, and risks associated with a new telehealth program for everyone as there is no model that is suitable or applicable to every patient or healthcare provider’s needs. The initial cost analysis begins with distinguishing between fix and variable costs. Fixed costs include the actual “purchase of the equipment and technology” necessary to operate the telehealth program, and variable costs consist of “maintenance and periodic replacement of equipment, training, technical support, provider and telepresenter wages, administrative support, and supplies” (p. 354). The expectation is for telehealth costs to be equal to or less than operating costs for the standard brick-and-mortar practices as the costs are generally “driven by provider and support staff wages” (p. 354). Also, reimbursement for telehealth services are impacted by geographical location, payer mix, and alternative payment models.
Greenspun, Casey, and Kane (2016) report the average telehealth visit costs between $40-$50 when compared to face-to-face acute care visits of $136-$176. Because approximately 83% of patients’ problems are solved during the initial telehealth visit, the researchers concluded that a telehealth visit could save Medicare approximately $45 per visit and lower overall cost. Olson and Thomas (2017) argue that telehealth cost, fixed and variable, can be much lower than traditional approaches due to: the encounter involving less of the healthcare provider’s time, less travel time to receive services, and using technology to augment an existing program. Sabesan et al. (2014) articulate that telehealth reimbursement may or may not be “financially viable option” for specialist practice. The state licensure boards across the United States are responding to the demand, and academic medical institutions are making it possible to extend services statewide. However, there remains a disconnect in providing telerehabilitation via the telehealth program being implemented in the state of Mississippi.

Because this model of delivery is new to many in Mississippi, how receptive individuals in rural Mississippi will be has yet to be determined. Various lobbyists are challenging lawmakers to increase reimbursement rates and services for therapy as approved providers (Colick, 2017); however, according to Wakeford, Wittman, White, Schmeler, and Brayman (2005), only four states have approved telerehabilitation services to be covered by Medicaid programs: Louisiana, Hawaii, Minnesota, and Nebraska. The rationale for Medicaid being approved as a payor source for occupational therapy services in these states is due to occupational therapy practitioner shortage in the rural areas. No additional information is available regarding the circumstances, frequency, or
condition regarding payment arrangements (Wakeford, Wittman, White, Schmeler, & Brayman, 2005).

As of 2014, 22 states have legislative mandates for reimbursement coverage by private insurance (Cason, 2014). Some options exist for contractual arrangements with private pay sources. Private insurance companies typically follow the trend established by Medicare. The Children’s Community Health Plan (CCHP) argues that while some states are moving forward with establishing laws that support telehealth, other states are enacting limitations on telehealth-delivered services (Wicklund, 2016). Mississippi is one of several states that receives an ongoing grant from the USDA through the Distance Learning and Telemedicine (DLT) Grant Program; furthermore, the equipment will use broadband to help rural communities connect to advanced learning and specialized medical services (Wicklund, 2018b).

The Department of Defense and the Veterans Health Administration have extended their financial support to well over $500 million for telehealth services (Cason, 2014). Gitlin-Nitti, Shah, and Kharlamb (2015) note that this expansion will allow for increased access for veterans to receive healthcare and telerehabilitation services. Inevitably, this method saves time, resources, and money for the therapist, insurance provider, medical staff, and medical facility. Currently, the U.S. Department of Defense and Veteran’s Health Administration have included occupational therapy practitioners as eligible healthcare providers for select telehealth programming (American Occupational Therapy Association, 2013a).

Medicare has been more restrictive, reimbursing only when the beneficiary resides in a rural area or an area with a health professional shortage (Greenspun, Casey,
& Kane, 2016). While at a slow pace, reimbursement is expanding under the Medicare Access and CHIP (Children’s Health Insurance Program) Reauthorization Act of 2015 (MACRA). In addition to these two areas, a new bundled-payment formula for cardiac care and joint replacement as well as in the Next Generation Accountable Care Organization payment model has been initiated (Tuckson, Edmunds, & Hodgkins, 2017). Keeping up with the telehealth usage trend, the 21st Century Cures Act requires the federal government study the effect of telehealth on Medicare beneficiaries, which could impact payment and reimbursement for telehealth services received across the board (Tuckson, Edmunds, & Hodgkins, 2017). Historically, occupational therapists and occupational therapy assistants utilizing telehealth technologies have been dependent upon state and federal grants. Wakeford, Wittman, White, Schmeler, and Brayman (2005) contend that some practitioners have been successful in negotiating fee-for-service with third party payers and with private pay.

Perceptions and Attitudes of Telehealth

Consumers residing in rural and remote areas are at a significant disadvantage as it pertains to access to healthcare services. Hoffman and Cantoni (2008) allude that the disadvantages exist due to urbanization of health services, extended distances required to travel to receive services, lack of transportation, and difficulty recruiting and retaining healthcare providers into those areas. When considering telerehabilitation, Russell (2009) indicated that the slow advancement of therapies using telehealth is multifaceted; moreover, rehabilitation therapies are heavily “skilled-based” with physical touch, and diagnosis and interventions are derived from objective measurements of performance. One of the most important factors to consider when implementing a successful telehealth
program is the acceptance of healthcare providers (Brewster, Mountain, Wessels, Kelly, & Hawley, 2014). Rogers (2003) argues that perceptions and attitudes toward telehealth technological services will be influenced by exposure and experience. When planned and implemented correctly to suit the consumers’ needs, telehealth has a high favorability among consumers and healthcare providers. The same findings were evident in a study conducted by Schein, Schmeler, Saptono, and Brienza (2010) in which the researchers concluded that the use of telerehabilitation services resulted in a high level of patient and healthcare provider satisfaction. Jafni, Bahari, Ismail, and Radman (2017) argue that “readiness” is an important theme as it pertains to the healthcare providers’ (stakeholders) willingness and acceptance towards implementing telerehabilitation services, which can be viewed as a willingness to receive and apply the telerehabilitation to the patient.

Brewster, Mountain, Wessels, Kelly, and Hawley (2014) completed a mixed-method systematic review with ten studies and concluded that the most common facilitators of staff acceptance were “easy to use, reliable equipment and collaboration; whereas, the most identified barriers were negative impact of service change or implementation, negative impact on staff-patient relationships, low expectations of outcomes or need, and negative impact on staff autonomy or credibility” (p. 21-22).

Gustke, Balch, West, and Rogers (2000) examined patient satisfaction from 495 real-time telemedicine clinical consultations in Greenville, NC at the Telemedicine Center at East Carolina University School of Medicine. According to the researchers, the patient satisfaction rate was around 98.3%; furthermore, issues that patients often complain about with traditional medicine, i.e., appointment scheduling, travel time, and patient
involvement in the physical examination, received higher patient satisfaction with telemedicine consultations.

When looking at demographics, Lowitt, Kessler, Kauffman, Hooper, Siegel, and Burnett (1998) reported that more than 80% of the patients under the age of 45 preferred a teleconsultation versus commuting more than two hours for a face-to-face visit. However, less than 70% of patients over than age of 70 preferred a teleconsultation visit. The researcher determined no significance existed when education, type of medical procedure or exam being rendered, or the distance the patient resided from the medical facility were considered (Lowitt, Kessler, Kauffman, Hooper, Siegel, & Burnett, 1998). Similarly, Movahedazarhouligh and colleagues (2015) concluded that age influences the perceptions and attitudes towards telehealth and telemedicine. Moreover, the study conducted by Movahedazarhouligh and colleagues (2015) showed that patients under the age of 30 reported a greater interest in modern telehealth technology and a more positive view of utilizing the technology. As age increased, less patients reported a “definite agreement” with a willingness to incorporate technology into medical treatment sessions.

As mentioned above, telehealth practices establish a connection between the patient and a medical professional often not located within rural areas. In a study conducted by Huston and Burton (1997), only 16% of patients reported a preference of having a face-to-face visit with the specialist. Burke and Hall (2015) argued that while the overall consensus towards telehealth is positive with most patients being accepting of the delivery model, it is the healthcare providers who appear to have more reservations. Brewster, Mountain, Wessels, Kelly, & Hawley (2014) commented the same ideation that in order for the program to be successful, it is important to achieve acceptance by the
healthcare provider. In their study of telehealth, Burke and Hall (2015) concluded that the healthcare provider’s acceptance revolves around “the ease of use” and “perceived usefulness,” while the patients were more concerned with their privacy, adopting new healthcare methods, and worries of operating the telehealth technology. Bradford, Caffery, and Smith’s (2015) research revealed that in order for telehealth to continue to grow and be successful, the public must be educated to increase awareness and understanding of the powers and benefits of its use. In addition, encouraging patients to formulate the partnership to manage their healthcare may also be another growth factor for telehealth.

Rehabilitation Telehealth

The American Occupational Therapy Association is advocating for additional research to be conducted to gain insight as to how therapy services can be rendered via telecommunication as virtual rehabilitation is inevitable and is becoming a rapidly developing service model. Papanagnou, Sicks, and Hollander (2015) argue that it is imperative for healthcare providers to learn how to incorporate telehealth into their practice. According to the American Telemedicine Association (2010), telerehabilitation has the “capacity to provide service across the lifespan and across a continuum of care.” Savard, Borstad, Tkachuck, Lauderdale, and Conroy (2003) indicate that one significant benefit of rehabilitation telehealth is the potential to formulate connectivity between general clinicians and specialists. Researchers believe telerehabilitation has the potential to bridge the therapy service delivery gap to rural areas (Russell, Blumke, Richardson & Truter, 2010). While delayed in their response to licensing rehabilitation therapists as qualified healthcare providers, Mississippi is currently one of fifteen states enacting laws
that grants therapists the ability to extend their practices via telemedicine (Wicklund, 2018a).

Through healthcare policy changes and the availability of information and communication technologies, occupational therapy has been forced to modify its mode of delivery and adjust to the changing times with the application of telehealth (Cason, 2014). Research supports the use of telehealth as a viable service delivery model due to its efficiency and effectiveness that results in similar or better clinical outcomes in comparison to traditional interventions (Cason, 2014). Studies indicate similar outcomes between telehealth and conventional methods for occupational therapy for the areas of wheelchair assessment, pre-admission orthopedic occupational therapy home visits, assessment of activities of daily living, hand function with individuals with Parkinson’s disease, and ergonomic assessment (Cason, 2014).

The American Occupational Therapy Association advocates for occupational therapy students to acquire upon graduating or through their program the skills and knowledge to use telehealth upon graduating from an accredited occupational therapy program (Cason, 2014). The Accreditation Council for Occupational Therapy Education (ACOTE) has set aside special requirements for students to increase their competency with telehealth as well as knowledge and understanding of technology to deliver occupational therapy services (American Occupational Therapy Association, 2018; Cason, 2014). Cason (2012) articulates that occupational therapy has the potential to use telehealth to increase “accessibility of services to clients who live in remote or underserved areas; improve access to providers and specialties otherwise unavailable to clients; prevent unnecessary delays in receiving care, and decrease isolation for
practitioners through distant learning, consultation, and research, among other activities” (p.133).

Occupational Therapy Telehealth

Cason (2014) argues that research supports the use of telehealth as a viable service option to receiving occupational therapy services. In an academic setting, faculty members can take advantage of telehealth to facilitate clinical reasoning skills training during a student’s rotation/fieldwork via ongoing dialogue about client cases through online assignments, discussion board forums, and the use of videoconferencing technology (Nicholson, Bassham, Chapman, & Fricker, 2014). Nicholson et al. (2014) also indicate that other occupational therapy practitioners have determined videoconferencing as an effective alternative to in-person interactions for caregivers, paraprofessionals, and other supportive individuals for home assessments with a therapist in a remote location.

Before an occupational therapy provider decides to implement a telehealth model of service, the patient’s diagnosis, client’s preference, access to technology, and ability to measure outcomes must be taken into consideration. An occupational therapy provider must also consider: “technology availability and options for the occupational therapy practitioner and the client; the safety, effectiveness, sustainability, and quality of interventions provided exclusively through telehealth or in combination with in-person interventions; the client’s choice about receiving interventions by means of telehealth technologies; the client’s outcome, including the client’s perception of services provided; reimbursement; and compliance with federal and state laws, regulation, and policy, including licensure requirements” (American Occupational Therapy Association, 2013a,
Savard, Borstad, Tkachuck, Lauderdale, and Conroy (2003) found two occupational therapy assessments to be just as effective when administered electronically versus face-to-face interaction. Furthermore, the researchers indicated that the Kohlman Evaluation in Living Skills and the Canadian Occupational Performance Measure illustrated agreement when completed locally versus remotely.

Occupational Therapy Telehealth Challenges and Opportunities

Extending occupational therapy services to rural areas presents many challenges as these individuals have “greater challenges accessing these services, experience more difficulties in daily activities, and often have worse prognoses than those in urban communities” (Nicholson, Bassham, Chapman, & Fricker, 2014). Researchers agree that populations in rural settings have even more difficulty with accessing medical attention from healthcare providers other than physicians, dentists, or pharmacists; furthermore, occupational therapy practitioners have an opportunity to change this inclination but are often faced with the realization of resistance due to the “anticipated feelings of isolation and lack of support” (Nicholson et al., 2014, p. 1). In addition, the idea of isolation and lack of support is often related to “isolation from resources for professional development” and “responsibility for service provision across wide geographical areas” (Nicholson et al., 2014, p. 1). Other challenges that may present to the patient and/or healthcare provider include information security breaches, lack of reimbursement by payer sources, technical failures, limited connectivity with Internet and wireless service, and limitations of the telehealth-based physical evaluation when indicated. While utilizing a telehealth service delivery model can be cost effective, there are rare instances in which the cost is more than the benefits, this is referred to as economic viability. According to Alkmim et
al. (2012), “to be economically viable and compensate for high fixed costs” the program must be utilized frequently with noticeable benefits within fields of greater demand (p. 376). The researchers also allude that the cost-benefit ratio also depends on the degree to which the telehealth service can deter other major costs, making this delivery model an inconsistent financial investment in certain areas. However, opting for low-cost, commercially available equipment could likely reduce the implementation costs (Alkmim et al., 2012).

Chedid, Dew, and Veitch (2013) conducted semi-structured telephone interviews with 13 occupational therapists working with various conditions in a rural area of New South Wales; the interview questions were focused on access to skills services and limitations of using information and communication technology. The results of the study revealed that electronic telecommunication has potential to augment traditional occupational therapy practices, enhance access to professional development, and reduce professional isolation. Challenges identified within the study consisted of three categories: individual, workplace, and community barriers. The individual barriers identified by the group included age cohort, knowledge, and personal preferences; workplace barriers were support and training and availability of resources; and community barriers were identified as infrastructure and perceptions of clients' acceptance. Chedid, Dew, and Veitch (2013) also articulated that the barriers should be addressed simultaneously in order for the occupational therapy program to be effective. Brewster, Mountain, Wessels, Kelly, and Hawley (2014) reported that the most common barriers within their study were negative impact of service change or implementation,
negative impact on staff-patient relationships, low expectations of outcomes or need, and negative impact on staff autonomy or credibility.

**Ethical Considerations**

Practicing healthcare is a moral obligation that requires elevating the patient’s needs above everything else. Chaet, Clearfield, Sabin, and Skimming (2017) argue that while telehealth is a new form of healthcare, healthcare providers must act ethically and morally. In addition, this form of healthcare has additional ethical concerns that should be taken into consideration. Due to the increase in third party involvement with telehealth, healthcare providers must be vigilant to protect the patient’s privacy and confidentiality, obtaining informed consent, establishing transparency to reduce anxiety with the new form of healthcare, develop competency with utilization of the equipment and tools, minimize conflicts of interests and biases, engage in a continuity of care without abandoning the patient, and collaborate with other healthcare providers to avoid the “pitfalls of electronically mediated care” (Chaet, Clearfield, Sabin, & Skimming, 2017, p. 1139). While both the Health Insurance Portability and Accountability Act of 1996 (HIPAA) and the Health Information Technology for Economic and Clinical Health Act of 2009 (HITECH) provide the criteria for establishing a patient’s protection, privacy, and security, one of the concerns identified by patients is the potential for privacy to be compromised (Burke & Hall, 2015; Peterson & Watzlaf, 2014).

It is imperative that network professionals ensure active firewalls or encryption techniques have been implemented to prevent a violation of the HIPPA law. Therefore, secure connections are mandatory, which can be a potential obstacle with establishing Internet connections within rural areas. Establishing the necessary infrastructure can
increase the cost of providing telehealth services in rural Mississippi, but it is the legal and ethical responsibility of the healthcare provider to ensure Internet-based connections are following HIPPA regulations (Wakeford, Wittman, White, Schmeler, & Brayman, 2005). The World Federation of Occupational Therapists (WFOT) implores occupational therapy practitioners using telehealth technologies to adhere to the WFOT Code of Ethics. In addition to these ethical obligations, practitioners must abide by and comply with “jurisdictional, institutional, and professional regulations and policies governing occupational therapy practice” (World Federation of Occupational Therapists, 2014, p. 38).
CHAPTER III - METHODOLOGY

The primary focus of this study centered on assessing healthcare providers’ perception, attitude, and knowledge of occupational therapy telehealth services. The research design was descriptive with quantitative methods.

Research Design and Design of the Study

A convenience sample of prospective participants was obtained from the 165 remote connections identified on the University of Mississippi Medical Center’s (UMMC) telehealth website. Only participants from rural areas were considered, which were 48. The identified director, manager, and primary healthcare provider of each facility were contacted via phone to verify the email address in which the email would be sent for the questionnaire. In addition to using the public knowledge information on UMMC’s website, the researcher contacted the Mississippi Office of Rural Health via telephone and gathered contact information from its website for additional healthcare providers in rural areas in Mississippi, a total of 8 facilities. Both of these initial contacts served as the first interaction with each of the facility representative. The first official interaction with the potential participant was an email to the healthcare provider with a link to an electronic survey. Two weeks after the initial email, a second email was sent as a follow-up reminder to take the survey and served as the official second interaction with the potential participant.

Data Collection

After obtaining IRB approval, contacting potential participants, and verifying the email addresses, potential participants received an email with an invitation to participate in a research study. This study utilized a survey (see Appendix E) to collect the relevant
information and demographic data. The survey was administered using Qualtrics, a software that is available free of charge to USM students and readily accessible at any time without permission. Interested participants who followed the link to the hosted survey on Qualtrics were first presented with an information letter. The participants reviewed and acknowledged the information letter. The information letter detailed the nature of the study, outlined the role and rights as a voluntary participant, the proposed usage of the anonymous data, and contained the informed consent. By providing informed consent to participate in the study, they acknowledged they were over the age of 18. The participant could withdraw at any point during the survey with no penalization or additional action being required. After completing the last question on the questionnaire, the participant received a message thanking them for their participation and prompting them to close the web browser page. The survey was closed on December 31, 2018. All responses were downloaded from Qualtrics onto the researcher's personal password protected computer to be analyzed via Statistical Package for the Social Sciences (SPSS). The SPSS file was downloaded, and the results were coded for analysis.

Data Analysis

Outcomes of the project were calculated using SPSS based on the participants’ responses to questions. The survey sought the respondent’s demographic information, including age, race, and years of experience. It was anticipated that a response rate greater than 35% would be sufficient to analyze the data, although a higher response rate would have been preferred. The prospective participants could access the survey and participate until December 31, 2018. The researcher received a response rate of 54%, significantly exceeding the minimum expectation. The results were tabulated in Spring
2019 and an official report was drafted. The results from the survey were displayed in tables, charts, and graphs; moreover, themes from the open-ended questions were identified and explored with supporting research and studies for future research. After drafting the report and completing the graduate project, the data from the questionnaire was deleted.

Trustworthiness

Mississippi demographics indicate a high poverty rate at 22.3% in comparison to 14.9% nationally (Campbell, 2019). In addition, Mississippi has lower than average education levels, limited industries in many rural areas, reduced local tax bases, and limited state funds (Pittman, 2015). Rural residents are mostly impacted by these conditions, which directly correlate to health disparities. There is a growing need to extend all areas of healthcare to individuals located in remote areas who do not ordinarily have access to treatment, whether it is financial or geographical based.

Many advances and innovations are being developed to execute occupational therapy services via telehealth. Connecting isolated and poverty-stricken individuals who have a rehabilitation medical need to occupational therapy telehealth services can provide a way for individuals to continue to recover, heal, develop strength, and reintegrate back into the community as a productive member of society. This research design consulted the primary healthcare providers in the medical industry, and they provided insight as to what rural patients need and the services that could produce the most benefits. Any insight regarding the healthcare provider’s perceptions, attitudes, and knowledge could be helpful in gathering information for future research.
Assumptions and Limitations of the Study

The national consensus is that consumers and practitioners have indicated overall satisfaction with telehealth; however, many challenges and obstacles continue to plague this emerging field as technology continues to dominate modern times. The limitations identified in this study were similar to those identified in other research related to this topic. Other researchers indicated that barriers to telehealth application include but are not limited to: “lack of reimbursement and sustained funding; limited technology infrastructure and interoperability; apprehension by practitioners and clients; privacy and security concerns; state licensure issues, including portability; and need for rigorous research supporting telehealth as a service delivery model” (Cason, 2012, p.134). While these may be the predominant themes in national studies, this study did not assess reimbursement or funding, privacy and security concerns, state licensure, or portability.

This research project also had limitations within the scope of its targeted purposes. There is a possibility that some questionnaires were not delivered to the correct healthcare personnel due to technological challenges and emails being sent to “junk” folders. Also, upon contacting the healthcare provider, the possibility for human error exists in explaining the purpose of the project and obtaining the correct individuals to participate in the study. In many instances, the individual with the most direct patient contact was unavailable, did not have the extra time to participate in the survey, or did not return the survey for unknown reasons. Because of privacy protection, some facilities do not allow external emails to be received.

Also, some respondents may not have understood some of the terminology indicated on the instrument. Some healthcare providers may not have had patients who
qualified for rehabilitation services, or may not have known the distinction between physical, occupational, and speech therapy, or may not have known the qualifying factors for physical, occupational, and speech therapy. Other limitations of the study were the difficulty the researcher had in obtaining healthcare providers’ email address and locating the appropriate healthcare provider in each facility to receive the survey. The researcher made many calls and left messages for potential administrators and healthcare providers; however, by the time of the survey expiration date, many of the phone calls and messages were not returned to the researcher. The study was also conducted around the holiday season, and many providers may have been vacationing when the survey was administered in November and December, which may have impacted the return rate. Two respondents did not consent to the study upon receiving the questionnaire.
CHAPTER IV – ANALYSIS METHODS AND FINDINGS

This study examined healthcare providers’ perceptions, attitudes, and knowledge of occupational therapy telehealth services in rural settings in Mississippi. Chapter 4 will summarize the collected data, report the analysis process, and provide the results of analysis while addressing the two primary research questions that guided this study. This chapter also presents the descriptions of the three overarching categories and themes that emerged during the data analysis process. Further, the contextual information about the healthcare practitioners’ desire for additional training and to know more about telehealth services, the type of technology with the most perceived benefits, effect on continuum of rehabilitation care, and the impact on improved patient’s functionality and caregiver training competency will also be presented.

The results of this study answer the research questions: 1) What are clinicians and other healthcare providers’ perceptions, attitudes, and knowledge of occupational therapy telehealth services? 2) How receptive all healthcare providers in rural areas in the state of Mississippi are towards referring their patients to occupational therapy rehabilitation services through telehealth? This research study relied on demographic and perception data collected via a questionnaire (see Appendix E). Healthcare providers servicing rural areas in the state of Mississippi were recruited through convenience sampling.

Analysis Methods

The researcher downloaded raw data from Qualtrics into an Excel file. Next, the data was coded and labeled. Analysis of the questionnaire data was conducted using SPSS software. The research questions and purpose of the study guided the coding process. Multiple cycles of coding occurred with the help of graduate research assistants.
in the RSC at the University of Southern Mississippi. Through the first iteration of coding, the researcher used short phrases to code the data based on the individual interview content.

Presentation of the Data

This section begins with the demographic background profiles of the research participants, including race, gender, age, years of healthcare experience, length of time in current position, and classification of current profession. Initially, 165 telehealth sites were identified through the University of Mississippi Medical Center Telehealth program and eight additional telehealth sites were obtained through the Mississippi Telehealth Association. From a total of 173 telehealth sites in Mississippi, 56 met the criteria to be considered for this study. The criteria for inclusion into the study included site location within counties in the “Delta” region of Mississippi, and trauma rating of the hospitals. The Delta region is identified by the Mississippi State Department of Health as an 18-county area in the Northwest part of Mississippi. The counties that make up the area include: Bolivar, Carroll, Coahoma, Desoto, Holmes, Humphreys, Issaquena, Leflore, Panola, Quitman, Sharkey, Sunflower, Tallahatchie, Tate, Tunica, Warren, Washington, and Yazoo counties (Mississippi State Department of Health, n.d.). Areas with medical institutions with trauma level rating of Level-3 to Level-5 were of consideration because Level-3 to Level-5 ratings typically have the lowest and often have limited resource availability.

Out of the 56 potential participants, 30 agreed to consent and completed the survey, representing a 54% return rate. A majority of the respondents were minorities at 80% and White-Caucasians represented 20%. Seventeen percent reported two or more
races and approximately 10% identified as Asian. Figure 4.1 identifies the races of the participants.

Figure 4.1 Representation of Race

Gender was equally distributed with fifteen (15) male and fifteen (15) female research participants. Most of the participants, 30%, were between 45-54 years of age, followed by 23% between 35-44 years of age, and 23% between 55-64 years of age. See Figure 4.2 for full representation of the age ranges.

Figure 4.2 Distribution of Age
When asked about years of healthcare experience, the participants reported a range from 0-30 years with 43.4% reporting 0-10 years of experience, 33.3% reporting 11-20 years of experience, and 23.4% reporting 21-30 years of experience. See Figure 4.3 below.

![Figure 4.3 Years of Healthcare Experience](image)

Approximately 70% of the respondents reported having 1-10 years of experience in their current position, followed by 23.3% with more than 11 years of experience, and less than 7% with less than one year of experience as characterized in Figure 4.4.

![Figure 4.4 Time in Current Position](image)

The last characteristic in the demographic profile of the participants was the identification of their medical profession. The survey provided the respondents with seven options to declare as their current vocation: Nursing, Rehabilitation Therapist, Consultant, Administration/Manager, General Physician, Specialist, and Other Specialty. Table 4.1
reflects the medical professions the respondents declared as their current line of work. Of the seven medical career paths selected for the survey, only five were acknowledged by the respondents. None of the respondents selected Specialist or Other Specialist.

<table>
<thead>
<tr>
<th>Classification of Healthcare Profession</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative/Manager</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td>Consultant</td>
<td>2</td>
<td>6.7</td>
</tr>
<tr>
<td>General Physician</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td>Nursing</td>
<td>15</td>
<td>50.0</td>
</tr>
<tr>
<td>Rehabilitation Therapist</td>
<td>5</td>
<td>16.7</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Table 4.1 Vocational Representation of Healthcare Providers*

Fifty percent of the respondents represented the nursing profession, followed by rehabilitation therapists at almost 17%, and physicians and administrative/managers at 13%. The professions that provide more direct patient care and direct patient access owed the greatest representation. A majority of the respondents (n = 24) indicated that they served rural areas and populations in Mississippi while the remaining (n = 6) did not serve this population. Years of healthcare experience and time within current positions were also factored into understanding the perceptions and attitudes of healthcare professionals. Table 4.2 depicts the distribution of years of healthcare experience in relation to time in current position.
Table 4.2 Time in Current Position/Healthcare Experience

When considering years of healthcare experience in relation to time in current position, the most represented group, 23%, included those with up to 10 years of healthcare experience and with 1-5 years in current position. Table 4.3 shows the proportion of respondents’ knowledge of telehealth in relation to years of healthcare experience. Respondents with 6-10 years of experience appeared to be more knowledgeable about telehealth than their peers with more or less experience. See Table 4.3 below.

Table 4.3 Telehealth Knowledge & Healthcare Experience
Interpretation of the Data

This section provides the interpretation of the data for this capstone project and includes the emerging categories and themes that were developed after the data was coded and analyzed using frequency components of SPSS. Also, the survey contained a Likert scale that will be analyzed in this section. The three major categories that emerged from the open-ended questions were telehealth as Practical Usage, Experience, and Occupational Therapy Telerehabilitation. Figure 4.5 summarizes the categories with associated themes and ideas that appeared to be common among the healthcare practitioners.

Figure 4.5 Emerging Themes and Categories

Research Findings

As identified in Figure 4.5, three overarching categories emerged pertaining to telehealth: practical usage of telehealth within daily practices, experiences with telehealth, and occupational therapy telerehabilitation as a segment of telehealth. Within
each specified category, themes and associated ideas emerged to reflect healthcare practitioners’ perceptions and attitudes of general telehealth and occupational therapy telehealth services in rural areas of Mississippi.

Practical usage of telehealth

The survey results revealed that nurses were evenly divided in terms of daily application of a form of telehealth technology, such as teleconsultation, videoconferencing, telemedicine education, and telepathology. The first emerging theme explore the respondents’ practical use of telehealth technology. Figure 4.6 shows a comparison of each profession’s use of telehealth technology. Rehabilitation therapists and administrative/management professionals have the most striking differences between those who use telehealth technology and those who denied use of telehealth technology. Of the five rehabilitation therapists responding to the survey, 75% indicated they do not currently use telehealth technology. As previously indicated, telerehabilitation is not being aggressively marketed as some other disciplines within the medical profession.

![Figure 4.6 Practical Usage of Telehealth Technology](image-url)

*Figure 4.6 Practical Usage of Telehealth Technology*
Of the healthcare professionals acknowledging the use of some form of telehealth, the researcher analyzed the provider’s perception of the telehealth technology. More specifically, the perception component included the respondent’s knowledge of other services that can be provided through telehealth, ease in applying telehealth, level of training to implement telehealth services, knowledge about the meaning of telehealth, knowledge about the benefits of telehealth, knowledge about the application/types of telehealth services, time required to adopt telehealth services, importance of telehealth, financial barriers to telehealth, and technology challenges.

The most common barriers identified include a lack of knowledge of other services of telehealth (73%) and a lack of knowledge about potential benefits of occupational therapy being delivered via telecommunication (53%). Approximately 80% of the respondents indicated that their patients would have no difficulty in applying the technology, and 93% of the healthcare providers believe telehealth is important and could serve an important role in healthcare in general. Lack of training and lack of technology are two barriers and challenges reported to be equal among the respondents. However, a majority of the respondents expressed some level of interest in learning more about telehealth.

The data reported in Figure 4.7 indicates that nursing and rehabilitation therapists are more interested in learning about telehealth as compared to other healthcare professionals. Again, nursing and rehabilitation therapists spend more time with patients by providing direct care compared to the other disciplines.
As shown in table 4.4, a majority of the respondents indicated an interest in learning more about telehealth. As indicated in previous sections, research shows a growing trend of telehealth and telerehabilitation as these professionals are interested in being proactive with preparing for the inevitable in order to provide their patients with good quality and comprehensive care.

Table 4.4 Profession & Telehealth Interest
When comparing years of healthcare experience and awareness of telehealth, 100% of respondents with 11-15 years of healthcare experience indicated no awareness of telehealth. No statistical significance seems to appear among the remainder ranges of overall healthcare experiences. It is difficult to draw a conclusion as to whether the length of the career provides exposure to telehealth practices. However, it is possible that since the respondents serve the rural areas of Mississippi, they may not have the resources to become exposed to advanced telecommunication technology.

![Figure 4.8 Telehealth Awareness & Healthcare Experience](image)

*Figure 4.8 Telehealth Awareness & Healthcare Experience*

*Experience using telehealth*

The second theme addresses respondents’ experience using telehealth. Telehealth in its current form is technologically advanced and innovative; moreover, telehealth continues to evolve using various aspects of old and new technology as its infrastructure foundation. The technology used with telehealth can range in complexity from a simple task of a patient conversing with a nurse to monitor diabetes symptoms through a telemonitor to a physician orchestrating a surgical procedure. However, the level of experience and exposure with telehealth equipment and the concept is inconsistent across the healthcare profession. Table 4.5 shows that approximately 47% reported
implementing telehealth technology while 53% denied using telehealth technology. Of the 47% that indicated use of telehealth technologies, 50% were nurses and 21% were administrative/management. Nursing represents the population that provides direct patient care while administrative/management provides indirect patient care; thus, there may be a difference in the type of technology these professions are implementing.

Table 4.5 Experience Using Telehealth & Job Classification

<table>
<thead>
<tr>
<th>Implement telehealth technology</th>
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</tr>
</thead>
<tbody>
<tr>
<td>% within Implement telehealth technology</td>
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<td>6.3%</td>
</tr>
<tr>
<td>% within Classification of Job/Profession</td>
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</table>

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<th>Consultant</th>
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<th>Nursing</th>
<th>Rehabilitation Therapist</th>
<th>Total</th>
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</thead>
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<td>14</td>
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<td>% within Implement telehealth technology</td>
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<td>50.0%</td>
<td>7.1%</td>
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<td>% within Classification of Job/Profession</td>
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<td>50.0%</td>
<td>46.7%</td>
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<td>% of Total</td>
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<th>No</th>
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</thead>
<tbody>
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<tbody>
<tr>
<td>% within Implement telehealth technology</td>
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<td>13.3%</td>
</tr>
<tr>
<td>% within Classification of Job/Profession</td>
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<td>100.0%</td>
</tr>
<tr>
<td>% of Total</td>
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<td>16.7%</td>
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<th>Administrative Manager</th>
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<th>General Physician</th>
<th>Nursing</th>
<th>Rehabilitation Therapist</th>
<th>Total</th>
</tr>
</thead>
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<tr>
<td>Implement telehealth technology</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>15</td>
<td>30</td>
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<tr>
<td>% within Implement telehealth technology</td>
<td>13.3%</td>
<td>6.7%</td>
<td>13.3%</td>
<td>50.0%</td>
<td>16.7%</td>
</tr>
<tr>
<td>% within Classification of Job/Profession</td>
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<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>% of Total</td>
<td>13.3%</td>
<td>6.7%</td>
<td>13.3%</td>
<td>50.0%</td>
<td>16.7%</td>
</tr>
</tbody>
</table>

Table 4.5 Experience Using Telehealth & Job Classification

The respondents were asked about the frequency in which they engaged or used telehealth technology consisting of teleconsultation, videoconferencing, telemedicine education, and telepathology. Nursing was the only profession that showed a significant usage of teleconference. Within a six-month period, nurses were 10 times more likely than their cohorts to use teleconferences, as shown in Table 4.6. This level of usage may be related to nurses’ role as the catalyst within medical facilities for implementing healthcare to patients.
Table 4.6 Teleconference Attendance & Job Classification

Occupational therapy telerehabilitation

The third emerging theme from the data is the knowledge of occupational therapy services being offered through telehealth as telerehabilitation. Approximately 50% of respondents indicated their patients were denied occupational therapy services, while the other 50% indicated their patients were not denied occupational therapy services, whether traditional or through telecommunication technology. Figure 4.9 shows the proportion of respondent’s indicating their patients were denied traditional occupational therapy services.
Figure 4.9 Occupational Therapy Patients Denied Services

Of the 83% of professionals who reported their patients received occupational therapy, over 80% indicated that telehealth provides some benefits if the traditional form of therapy was limited or not accessible by the patient or caregiver(s). In addition, 60% of the respondents whose patients received occupational therapy agreed that telehealth could be beneficial, as illustrated in Figure 4.10.

Figure 4.10 Patients Receiving Occupational Therapy Services
Figure 4.11 Telehealth Saves Time

In addition to indicating that telehealth can be beneficial with providing a continuum of care, over 80% indicated that telehealth can save time. Of the 17% who reported not having patients receive occupational therapy, 60% agreed that telehealth could save time. As Figure 4.12 illustrates, none of the respondents who indicated their patients did not receive occupational therapy reported that they strongly disagree that telehealth saves money. Therefore, a majority of respondents agree that telehealth can save money.

Figure 4.12 Telehealth Saves Money
When asked if occupational therapy telehealth allows for ease of network access to rural populations, almost 20% of respondents disagreed, as shown in Figure 4.13. Also, an overwhelming majority agreed that occupational therapy telehealth can improve the quality of care services in rural areas, as revealed in Figure 4.14. A majority of respondents agreed that occupational therapy telehealth can enhance access to healthcare services, the percentage of respondents that agreed was similar to the percentage that agreed that occupational therapy telehealth can improve the quality of healthcare services in rural areas of Mississippi, as shown in Figure 4.14 and Figure 4.15. Overall, the consensus is that occupational therapy telehealth can be beneficial in saving time and money, while improving quality of healthcare services and increasing access to services in rural areas of Mississippi.
The majority of the respondents, 83%, indicated that their patients have received traditional face-to-face occupational therapy services, either currently or in the past; furthermore, these same participants also believed that videoconferencing, store-forward, and interactive two-way methods can be beneficial when occupational therapy is offered through the telehealth service delivery model when occupational therapy services can not
be provided through a traditional route. Figures 4.16, 4.17, and 4.18 demonstrate the percentage of respondents who indicated the benefit of each telecommunication device.

**Figure 4.16 Benefits of Videoconferencing**

![Bar chart showing benefits of videoconferencing](image)

**Figure 4.17 Benefits of Store-Forward Models**

![Bar chart showing benefits of store-forward models](image)

Over 80% of respondents who indicated that their patients had received traditional occupational therapy also reported positive experiences with videoconferencing in other healthcare areas. Thus, these healthcare providers believe that videoconferencing could
be effective and beneficial with implementing occupational therapy telehealth services. When comparing all three forms of telecommunication, videoconferencing, store-forward, and interactive two-way way, slightly more of all the respondents favored the store-forward technology. The consensus amongst all the respondents who reported their patients had received occupational therapy, was that the interactive two-way method could have more technological difficulties with establishing and maintaining a connection within rural areas of Mississippi. Nevertheless, both methods were viewed as beneficial by the healthcare practitioners who had patients with a history of receiving occupational therapy. Simultaneously, despite having a beneficial perception of incorporating these telecommunication methods into occupational therapy practice, the practitioners who acknowledged that their patients receive occupational therapy in the past tend to believe that some element of the telehealth technology may pose difficulties for some of their patients, as indicated in Figure 4.19.

![Figure 4.18 Benefits of Interactive Two-way Models](image)

*Figure 4.18 Benefits of Interactive Two-way Models*
Last, the respondents were asked about the use and benefits of using occupational therapy telerehabilitation to manage chronic illnesses, falls, and to facilitate a continuum of care. A continuum of care can be orchestrated through follow up visits through telecommunications, whether verbal or visual. Both groups of healthcare professionals, over 80% from each group, indicated that occupational therapy telehealth can assist in the continuum of care by managing chronic illnesses, fall prevention, and follow-up care after a patient has had a face-to-face contact with their healthcare provider. Figures 4.20 and 4.21 show the percentage of healthcare providers who acknowledged how beneficial occupational therapy telehealth can be with the facilitation and management of chronic illness, falls, and continuum of care.
Figure 4.20 Telehealth & Chronic Illnesses

Figure 4.21 Telehealth & Follow-up Care
CHAPTER V – DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

Chapter 5 begins with the presentation of the demographic information of the participants, followed by a presentation of obtained categories and themes, and concludes with summary, conclusion, recommendations, and suggestions for future research. Some healthcare providers located in the “Delta” region of Mississippi were asked to participate in a survey to gauge their perceptions, attitudes, and knowledge of occupational therapy telehealth services in rural settings in Mississippi. Of the 56 healthcare professionals located in rural Mississippi who received the survey invitation, 30 consented to take the survey and returned their responses by the designated due date of December 31, 2018. While the sample size is relatively small, this study serves as a foundation for additional studies to be conducted in Mississippi. Demographically, the respondents were equally divided amongst males and females. Over half, 80%, of the respondents were from minority races, 20% were Caucasians. Almost 17% were two or more races and Asians represented 10% of the respondents. In terms of age, about 30% of the respondents were between the ages of 45-54, followed by 23% between 35-44, and 23% were 55-64.

The survey asked participants about the length of time in healthcare and length of service in current positions. Twenty-seven percent of respondents reported having between 6 – 10 years of healthcare experience, 20% had 11 – 15 years of experience, 17% had 0 – 5 years of experience, 17% had 21 – 25 years of experience, 13% had between 16 – 20 years of experience, and 6% had 26 – 30 years of experience. The healthcare disciplines represented in the survey responses consisted of administrative/manager (13%), consultant (7%), general physician (13%), nurse (50%), and rehabilitation therapist (17%). The nursing profession represented half of the
respondents. Analysis of the data revealed no significance or pattern in terms of years of healthcare experience and knowledge about telehealth services.

The analysis of the data from the open-ended section of the survey questions revealed three overarching categories, themes, and ideas. The three categories were telehealth as practical daily usage, experience of the healthcare provider with telehealth, and occupational therapy telerehabilitation as a segment of telehealth. Each of the categories had respected themes and associated ideas, as evident in Figure 4.1. When attempting to implement an occupational therapy telehealth program in the state of Mississippi, taking these identified categories, themes, and ideas into consideration can be insightful and increase the ease with implementation of the service delivery model.

Occupational therapy is not being aggressively marketed as a telehealth option in Mississippi; thus, many obstacles and challenges will exist upon implementing this service delivery model. As the literature states, only four states in the United States actively pursue occupational therapy and other therapy disciplines due to the shortage of healthcare practitioners in rural areas. Thus, in this study, approximately 75% of rehabilitation therapists indicated that they do not implement telehealth technology. Advocating and promoting telerehabilitation in Mississippi could extend therapeutic services to isolated areas and facilitate a continuum of care.

The data revealed that the most common perceived barrier to implementing occupational therapy telehealth were lack of knowledge as to how the service delivery model can be applied to a physically demanding and hands-on discipline. The respondents indicated a lack of knowledge about the different areas and specialties of occupational therapy that could be addressed with a telehealth service delivery model.
These findings are in alignment with previous studies identified in earlier chapters of this capstone project. Another finding of this study that appears to correlate with other research regarding healthcare practitioners’ belief is that telehealth is important and can serve as an important role in healthcare in general. However, healthcare providers are concerned that they are not receiving adequate technology training to meet the demands of this growing trend. A majority of the respondents of this study would like to learn more about telehealth, particularly nursing and rehabilitation therapists. No significant pattern emerged regarding the years of healthcare experience and telehealth awareness. It is difficult to conclude as to whether the length of time in the career impacts exposure to telehealth practices within this study due to the small sample size. Nursing was the only profession that showed a significant usage of teleconference in comparison to their peers.

When asked about whether their patients have received occupational therapy, about 83% of the respondents acknowledged that their patients received occupational therapy services. A majority of healthcare professionals, whether their patients had or had not received occupational therapy, agreed that occupational therapy via telehealth can offer some benefits, such as saving time and money, increasing ease of network access, and improving quality of healthcare. All forms of telehealth technologies presented in this study received positive reviews from healthcare practitioners: videoconferencing, store-forward, and interactive two-way. The last emerging idea from this study involved whether occupational therapy telehealth, when compared to face-to-face follow-up care appointments, could assist in managing chronic illnesses and falls. The belief among the respondents is that follow-up appointments have a higher potential to manage chronic conditions and fall preventions when compared to telehealth technology services. In
general, telehealth technology can be a viable option in the event a patient is unable to have a face-to-face physician visit.

Conclusion

This capstone project sought to understand: (1) What are clinicians and other healthcare providers’ perceptions, attitudes, and knowledge of occupational therapy telehealth services? (2) How receptive are healthcare providers in rural areas in the state of Mississippi towards referring their patients to occupational therapy rehabilitation services through telehealth? The results of this capstone project revealed that healthcare providers practicing in rural Mississippi have varying perceptions and experiences regarding telehealth and occupational therapy via telehealth. The varying exposure and knowledge of occupational therapy telehealth impacted the responses as it related to potential benefits and existing barriers and challenges that their patients could encounter. A majority of the healthcare providers reported interest in learning how to implement telehealth technologies, particularly, nursing and rehabilitation therapists. Overall, the respondents indicated that occupational therapy telehealth services can save money, reduce time, and help manage chronic illnesses.

Recommendations

Promoting occupational therapy telehealth in rural areas of Mississippi could provide solutions to the healthcare provider shortage in the areas and facilitate a continuum of care to patients with chronic illnesses, diseases, and physical disabilities. With professional development seminars, the referring healthcare providers can learn the fundamental basics for future examination, understanding, and implementation of this service delivery model so they can refer their patients for occupational therapy telehealth
services. Through implementing a promotional and marketing campaign, medical facilities and healthcare providers can increase the awareness of this service delivery model to the public and community, educate current and future occupational therapy clinicians, and establish the foundation for occupational therapy programs and the profession in rural Mississippi.

Suggestions for Future Research

Occupational therapy is a distinguished profession within the rehabilitation field. When considering occupational therapy through a telehealth service delivery model, many individuals do not understand how a hands-on profession can be delivered with telecommunication. Thus, occupational therapy has not reached the same distinguished recommendation within the telehealth field. For this transition to be successful, healthcare providers need to be adequately educated and trained in the use of telehealth technology as a service delivery model and knowledgeable of occupational therapy benefits through telehealth service delivery method. This study assessed the knowledge and perception of healthcare providers in rural Mississippi as it pertained to occupational therapy via telehealth. The results can be a catalyst for future research and for modifications to occupational therapy curriculums that lack the presence and teaching of this service delivery model. The survey did not take into consideration the specialty area within each profession, i.e., if the rehabilitation therapist was physical therapy, occupational therapy, or speech therapy. Because this project assessed telehealth in general, there is no data recording the differences in technology being used by each medical discipline and this can be specified in future research.
Dear Healthcare Practitioner:

I am a third-year doctoral student at the University of Southern Mississippi, under the direction of Dr. Lilian Hill to complete the requirements of the capstone project. I would like to invite you to participate in my research study investigating healthcare providers’ perception, attitude, and knowledge of occupational therapy telehealth services, which has the potential to impact patients’ awareness of alternative methods to receiving therapy services in rural Mississippi and the likelihood of referring patients to occupational therapy telehealth services.

If you agree to participate, please click the link below to complete the brief questionnaire. This questionnaire should take no more than 5-10 minutes of your time and your responses will be completely anonymous. Your participation in this study is completely voluntary and anonymous. The aggregate results of this study may be published.

By continuing to the questionnaire, you will be giving informed consent to participate in the study and will be acknowledging that you are over the age of 18. The questionnaire needs to be completed by December 31, 2018. If you choose not to participate or wish to withdraw from the study at any time, there will be no penalty and it will not affect your practice as a healthcare provider in any way.

If you have questions concerning the research study, please contact Melody Burrage at melody.burrage@usm.edu. I would like to thank you in advance for your time and consideration.

Live link: Click here to assess the questionnaire. If the link is not highlighted, copy and paste it into the address bar of your browser’s window.

Thank you for your time.

Sincerely,

Melody Burrage, OTR/L, MOT, Ed.D candidate

Dr. Lilian Hill, PhD, Faculty Advisor
Reminder Email Recruitment Script
Melody Burrage
Graduate Student in Higher Education Administration
REMININDER: Telehealth and Rehabilitation Study

Dear Healthcare Practitioner:

This is a friendly reminder that I would greatly appreciate your perspective as a healthcare provider for my research study. Please click the link below to assess the brief survey. This survey should take no more than 5-10 minutes of your time and your responses will be completely anonymous. Surveys need to be completed by December 31, 2018.

If you have any questions concerning the research study, please contact Melody Burrage at melody.burrage@usm.edu. Thank you again for participating.

Live link:
Click here to assess the survey.
If the link is not highlighted, copy and paste it into the address bar of your browser’s window.

Sincerely,
Melody Burrage, OTR/L, MOT, Ed.D candidate
Dr. Lilian Hill, PhD, Faculty Advisor
Dear Healthcare Practitioner:

I am a third-year doctoral student at the University of Southern Mississippi, under the direction of Dr. Lilian Hill to complete the requirements of the capstone project. I would like to invite you to participate in my research study investigating healthcare providers’ perception, attitude, and knowledge of occupational therapy telehealth services, which has the potential to impact patients’ awareness of alternative methods to receiving therapy services in rural Mississippi and the likelihood of referring patients to occupational therapy telehealth services. Occupational therapy is not being actively promoted to rural areas as an option through telehealth as much as other medical specialties in the state of Mississippi. As of the 2018 census, approximately 51.2% of Mississippians continue to reside in rural areas, representing the 4th largest rural population in the country.

This study has the potential to indirectly impact educational practices, extending healthcare coverage, and policy-making. Furthermore, information gathered from this research can provide the foundation for future research to manage rehabilitation costs as the rural areas have less access to financial resources, provide continuous rehabilitation services after an acute episode or for managing chronic medical conditions, increase patients’ and caregivers’ knowledge through educational training, and educate academic programs to modify curriculums to prepare future therapists and healthcare providers as they strive to meet the needs of the population they will serve. Participation involves minimal anticipated risk due to the response being confidential and anonymous.

This questionnaire should take no more than 5-10 minutes of your time and your responses will be completely anonymous and your participation is completely voluntary. The questionnaire must be completed by December 31, 2018. Any questions about the research should be directed to the Principal Investigator using the contact information provided in Project Information Section above.

This project has been reviewed by the Institutional Review Board, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the IRB at 601-266-5997. Participation in this project is completely voluntary, and participants may withdraw from this study at any time without penalty, prejudice, or loss of benefits.
Consent is hereby given to participate in this research project. All procedures and/or investigations to be followed and their purpose, including any experimental procedures, were explained to me. Information was given about all benefits, risks, inconveniences, or discomforts that might be expected.

The opportunity to ask questions regarding the research and procedures was given. Participation in the project is completely voluntary, and participants may withdraw at any time without penalty, prejudice, or loss of benefits. Unless described above and agreed to by the participant, all personal information is strictly confidential, and no names will be disclosed. Any new information that develops during the project will be provided if that information may affect the willingness to continue participation in the project.

Questions concerning the research, at any time during or after the project, should be directed to the Principal Investigator with the contact information provided above. This project and this consent form have been reviewed by the Institutional Review Board, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5116, Hattiesburg, MS 39406-0001, 601-266-5997.

**CONSENT TO PARTICIPATE IN RESEARCH**

By clicking the box below, consent is hereby given to participate in this research project. All procedures and/or investigations to be followed and their purposes, including any experimental procedures, were explained to me. Information was given about all benefits, risks, inconveniences, or discomforts that might be expected.

[ ] Check this box if you consent to this study, and then click “Continue.” (Clicking “Continue” will not allow you to advance to the study, unless you have checked the box indicating your consent.)

If you do not wish to consent to this study, please close your browser window at this time.
General Demographic

1. What race or ethnic origin do you most identify?
   - White-Caucasian
   - African American/Black
   - Hispanic/Latino origin
   - American Indian/Alaska Native
   - Asian
   - Native Hawaiian/Pacific Islander
   - Some other race
   - Two or More Races
   - Prefer Not to Respond

2. What is your gender?
   - Male
   - Female
   - Other
   - Prefer Not to Respond

3. What is your age?
   - 25-34 years old
   - 35-44 years old
   - 45-54 years old
   - 55-64 years old
   - 65-74 years old
   - 75 years or older
   - Prefer Not to Respond
Healthcare Experience

4. How long have you worked in healthcare?
   - 0-5 years
   - 6-10 years
   - 11-15 years
   - 16-20 years
   - 21-25 years
   - 26-30 years
   - 31-35 years
   - 35 years or more

5. How long have you been in your current position?
   - Less than 1 year
   - 1-5 years
   - 6-10 years
   - 11-15 years
   - 15 or more years

6. Do you currently serve rural populations in the state of Mississippi?
   - Yes
   - No

7. What is the classification of your current profession? Check all that may apply.
   - Nursing
   - Rehabilitation Therapist
   - Consultant
   - Administration/manager
   - General Physician
   - Specialist
   - Other Specialty (specify) ____________________________
Telehealth Knowledge

8. To what degree are you knowledgeable that healthcare services can be administered by telehealth?
   - Not at all knowledgeable
   - Slightly knowledgeable
   - Somewhat knowledgeable
   - Moderately knowledgeable
   - Extremely knowledgeable

9. How interested are you in learning more about how telehealth can be used for other medical services?
   - Not at all interested
   - Slightly interested
   - Somewhat interested
   - Moderately interested
   - Extremely interested

10. Do you implement telehealth technologies at your healthcare facility, e.g., teleconsultation, videoconferencing, telemedicine education, telepathology, etc?
    - Yes
    - No

11. How many times have you attended teleconferences on any subject in the last 6 months?
    - <4
    - 5-10
    - 11-15
    - 16-20
    - >20
12. In your opinion, what are the barriers/challenges of adopting telemedicine (choose any that apply)?

- Lack of sufficient knowledge about other services/benefits of telehealth
- Difficulty in the application of telehealth
- Lack of training to implement telehealth services
- Lack of knowledge about meaning of telehealth
- Lack of knowledge about benefits of telehealth
- Lack of knowledge about applications/types of telehealth services
- Lack of time to adopt telehealth services
- I think it is not important
- Financial barriers
- Technology barriers or lack of technology
- Other reason, specify...

**Occupational Therapy Telehealth knowledge**

13. Have the patients you serve OR have served in the past received occupational therapy services?

- Yes
- No

14. Are you aware that occupational therapy can be delivered via telehealth?

- Yes
- No
This section of the survey contains statements to gather data assessing healthcare provider’s perception, attitude, and knowledge of occupational therapy telehealth services, which has potential to impact patient’s awareness of alternative methods to receiving therapy services in rural Mississippi and the likelihood of referring patients to occupational therapy telehealth services.

Next to each statement, select the number that best represents how strongly you feel about the statement by using the following scoring system:

1-strongly disagree 2-disagree 3-agree 4-strongly agree

<table>
<thead>
<tr>
<th><strong>Telehealth &amp; Occupational Therapy</strong></th>
<th>Strongly Agree (4)</th>
<th>Agree (3)</th>
<th>Disagree (2)</th>
<th>Strongly Disagree (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15) Using occupational therapy telehealth can be beneficial to my patient care and management.</td>
<td></td>
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<tr>
<td>16) Using occupational therapy telehealth can help save time.</td>
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<tr>
<td>17) Occupational therapy telehealth can help save money.</td>
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<tr>
<td>18) Occupational therapy telehealth allows for ease of network access to rural populations.</td>
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<tr>
<td>19) Occupational therapy telehealth can improve the quality of care services in rural areas.</td>
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<tr>
<td>20) Occupational therapy telehealth can enhance access to healthcare services.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Telehealth &amp; Occupational Therapy</strong></td>
<td><strong>Strongly Agree (4)</strong></td>
<td><strong>Agree (3)</strong></td>
<td><strong>Disagree (2)</strong></td>
<td><strong>Strongly Disagree (1)</strong></td>
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<tr>
<td>21) Incorporating videoconferencing during the plan of care for occupational therapy telehealth can be beneficial.</td>
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<tr>
<td>22) Store-and-forward (saving and forwarding information to patient/caregiver via technology) telemedicine is beneficial for patient and caregiver training.</td>
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<tr>
<td>23) Interactive telemedicine or two-way video conferencing can be beneficial when carrying out therapeutic interventions in rural areas.</td>
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<tr>
<td>24) Occupational therapy using telemonitoring or home telehealth can assist in managing chronic illnesses and fall prevention.</td>
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<tr>
<td>25) The use of technology will be difficult for my patients/caregivers to understand and use for therapy.</td>
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<tr>
<td>26) Follow-up via telehealth after face-to-face contact can be beneficial for optimal rehabilitation and continuation of care.</td>
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<tr>
<td>27) My patients have been denied access to occupational therapy due to lack of availability of services in the area.</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
NOTICE OF COMMITTEE ACTION

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately, but not later than 10 days following the event. Problems should be reported to ORI via the Incident template on Cayuse IRB.
- The period of approval is twelve months. An application for renewal must be submitted for projects exceeding twelve months.

PROTOCOL NUMBER: IRB-18-10
PROJECT TITLE: Telehealth and Rehabilitation
SCHOOL/PROGRAM: School of Education, Educational Research and Admin
RESEARCHER(S): Melody Burrage
Lilian Hill
IRB COMMITTEE ACTION: Approved
CATEGORY: Exempt
PERIOD OF APPROVAL: November 9, 2018 - November 9, 2019
Edward L. Goshorn, Ph.D.
Institutional Review Board Chairperson
REFERENCES


Center for Connected Health Policy (2013). State telehealth laws and reimbursement policies: A comprehensive scan of the 50 States and the District of Columbia.


