BEST PRACTICE MODEL FOR DELIVERY OF TELEHEALTH OCCUPATIONAL

THERAPY SERVICES FOR CLIENTS WITH DEMENTIA

AND THEIR CAREGIVERS

A DISSERTATION

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All experiences in life provide opportunities to learn and grow. The process of earning my PhD has been an educational journey that has allowed me to grow in my knowledge of occupational therapy, who I am as a person, and my life goals. However, none of this would be possible without the support of wonderful people in my life. I want to especially thank my loving family who provided me the support and encouragement to continue on this path. My husband and three boys who supported me even when it meant less time together and increased work for them around the house. They were with me every step of the way and I could not have completed this without their support. The rest of my extended family who always provided words of encouragement, especially my mom who was always made sure I knew how proud she was I took this journey. My friends and colleagues who were always there to assist during the struggles and provide assistance in any way they could. I want to especially acknowledge my PhD cohort of 2013. We started as classmates, but became friends that will be there to support each other for the rest of our lives. To my colleagues at the University of South Dakota who supported my journey. Good colleagues are essential in making this journey successful and I have a wonderful group of colleagues that supported me every step of the way. Last, but not least, I want to acknowledge my dissertation chair, Dr. Hersch, and committee members Dr. Chang and Dr. Tietze. Your expertise, guidance, and time throughout

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every day.

ABSTRACT

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Occupational therapy provides services to persons with dementia and their
caregivers to facilitate positive change in daily occupations. One underused method
to deliver services to this client population is through telehealth. Telehealth is a
health care delivery method that utilizes technology as the context of service
delivery. This dissertation work intended to close the gap between the current
evidence that supports the use of telehealth as an effective delivery health care
model and the limited evidence to support its use with persons with dementia and
their caregivers.

This dissertation study was completed in three phases. The first phase
collected data from occupational therapy, physical therapy, and speech-language
pathology practitioners to identify the current use, knowledge, and perceptions of
telehealth. The results of this study identified that telehealth had limited use in the
state of interest and the practitioners had limited knowledge about telehealth.

Despite the limited use and knowledge of telehealth reported, the practitioner participants had a general positive perception of the ease of use and usefulness of telehealth. The second phase aimed to describe persons with dementia and their caregivers' use of technology and perceptions of telehealth. This study identified the same limited knowledge of telehealth as was reported by the practitioner participants in study one. In addition, persons with dementia and their caregivers did report an openness to the use of technology for receipt of occupational therapy services. The third phase of this dissertation developed a best practice model for the delivery of occupational therapy services to clients with dementia and their caregivers. The best practice model was developed based upon the data collected in the first two phases and the synthesis of current best available evidence.

The intent of this dissertation was to narrow the evidence gap between telehealth and occupational therapy services to persons with dementia and their caregivers. Findings from this dissertation are seen as a forward step to highlight evidence that supports the use of telehealth as an effective delivery method providing occupational therapy services to persons with dementia and their caregivers.

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CHAPTER I

STATEMENT OF THE PROBLEM AND SPECIFIC AIMS

Introduction

The focus of this dissertation was to identify a best practice model for delivery of telehealth occupational therapy (teleOT) services to clients with dementia and their caregivers. This study adds to the literature that already exists on provision of teleOT for other diagnoses. Currently, a best practice model for delivery of teleOT services to clients with dementia and their caregivers does not exist. This dissertation, then, supports our professional responsibility to deliver services consistent with best practice based in evidence and the philosophical core of occupational therapy (American Occupational Therapy Association, 2010b).

Statement of the Problem

In the United States today, an estimated 5.3 million people are diagnosed with Alzheimer's type dementia, and this number is expected to increase 40% by 2025 (Alzheimer's Association, 2015). Dementia is a progressive disease, in most forms, that leads to an increase in caregiver assistance as functional and cognitive performance declines. The caregiver takes on a greater burden of care throughout the disease process that often leads to placement in a nursing home. Nursing home placement is often a difficult choice to make by the caregiver, but feel they have no

other options (Doble, 2009; Lewis, 2003). Services provided via telehealth may be able to provide intervention to the person with dementia and education to the caregiver to decrease this burden.

Telehealth can provide a viable delivery method to deliver occupational therapy services to clients who lack access to service (American Occupational Therapy Association, 2013b; Cason, 2015; Foran, 2011; World Federation of Occupational Therapists, 2014). One population that may benefit from teleOT services are clients with dementia and their caregivers. Occupational therapy has been shown to effectively provide interventions that improve functional status and decrease caregiver burden (Ciro, Hershey, & Garrison, 2013; Gitlin, Hauck, Dennis, & Winter, 2005; Gitlin et al., 2003; Lam et al., 2010). Evidence is also beginning to support the use of teleOT services with various client populations (Asano, Preissner, Duffy, Meixell, & Finlayson, 2015; Barlow, Liu, & Sekulic, 2009; Bendixen, Horn, & Levy, 2007; Boehm, Muehlberg, & Stube, 2015; Chumbler et al., 2012; Forducey, Glueckauf, Bergquist, Maheu, & Yutsis, 2012). A need for evidence to support the effectiveness of occupational therapy services for clients with dementia and their caregivers delivered through teleOT is warranted.

Occupational therapy practitioners are skilled to provide services to those with dementia to improve functional performance even as the disease progresses. Programs exist in the traditional in-person service environment that provide established protocols to improve the overall situation for clients with dementia and

their caregivers (Ciro et al., 2013; Gitlin et al., 2005; Gitlin et al., 2003; Lam et al., 2010). However, no known research has proven efficacy of these programs in a virtual context.

Purpose

The overall aim of this dissertation was to develop a best practice model for delivery of teleOT services to clients with dementia and their caregivers. The first purpose was to identify current use and perceptions of telehealth services by practitioners and secondly, perceptions of those with dementia and their caregivers. Identification of perceptions informed the overall anticipated acceptance of the teleOT practice model and assessed the needs of all parties involved to develop a system that has higher acceptance. Development toward this overall aim occurred in three studies. The three studies were an:

1) Assessment of practitioner perceptions about the use of telerehabilitation services.

2) Assessment of perceptions of teleOT services and technology needs of those with dementia and their caregivers.

3) Integration of the findings from studies 1 and 2 to develop a best practice model.

The overall design of the dissertation was mixed methods approach with use of both quantitative survey data and qualitative focus group data. A concurrent transformative design provided a method to collect both quantitative and

qualitative data from all stakeholders without one set of data influencing the other. This type of mixed-method design calls for simultaneous collection of both qualitative and quantitative data. Neither type of tradition is viewed as core or primary over the other so all the data was used in consideration for development of the best practice model (Corcoran, 2006).

Research Questions

The dissertation asked the following questions:

1. What is the practitioner's perception of the utility of telerehabilitation for use in delivering occupational, physical, and speech therapy services to clients in one upper Midwestern state?

2. How do clients with dementia and their caregivers perceive the use of teleOT services?

3. What kind of best practice model can be created from the results of studies 1 and 2 that will enhance dementia care via teleOT services?

Researcher's Perspective

The primary researcher for all three studies was a licensed occupational therapist with ten years of practice experience in clinical and academic settings. The primary researcher's expertise was in geriatrics in a skilled nursing, acute, and rehabilitation practice. This practice experience included clients with dementia and their caregivers. Prior to becoming a licensed occupational therapist, the primary

researcher worked as a certified nursing assistant and mental health aide in dementia care units at a skilled nursing facility and state mental health facility. In the academic setting, the primary researcher has taught content in the area of normal development of adulthood and the dementia disease process.

In addition to professional experience in dementia care, the primary researcher also had personal experience in dementia care. The primary researcher had two grandparents who suffered from different forms of dementia. The primary research witnessed the caregiving responsibilities provided by her mother and extended family. She also provided secondary caregiver assistance on an infrequent basis to both of her grandmothers. The personal experience with dementia affected the primary researcher's ability to connect with the participants of the second study. The personal experiences provided a deeper understanding of the disease process and its effect on the person and the caregivers.

The other main aspect of these studies is the use of telehealth. The primary researcher did not have prior direct clinical experience utilizing telehealth. Expertise in the use of telehealth was gained through continued education and previous research utilizing telehealth. The primary researcher has also lectured on the use of telehealth for the delivery of occupational therapy services to older adults.

The researcher's personal and professional experiences played a bias on the expectations of the dissertation work. The researcher had a desire to assist the

population of interest so was biased toward the assumption that telehealth could be

an effective method to providing occupational therapy services. To offset any biases,

the researcher took steps to objectively analyze results and involve other

researchers to analyze qualitative data to assure bias did not subjectively influence

the results.

CHAPTER II

BACKGROUND AND SIGNIFICANCE

Telehealth

For the last 40 years, the use of information and communication technologies in health care has widely been used as a means to increase efficiency and access. At that point in time, it was known as telemedicine. This was a term widely recognized as the delivery of medical care through technology. As other fields of health care became involved, the term telehealth became more widely accepted (American Telemedicine Association, 2012). The term telehealth encompasses a wide array of health care services delivered through technology for the purpose of evaluation, consultation, treatment, education, prevention, case management, supervision, and education (American Occupational Therapy Association, 2013b; Center for Connected Health Policy, 2014).

Development of multiple systems for telehealth delivery has accompanied the rise in the use of telehealth. These systems provide general use in terms of key features for particular populations of clients or use by specific professions. One example is the VISYTER system that provides a communication base for health care professionals. This system provides a web-based platform that provides quick access and appealing interface (Schutte et al., 2012).

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A second system, called Virtual Rehabilitation Center, targets a population of clients with traumatic brain injury. The design of this system is to rehabilitate clients post-TBI with an internet based system for use in the client's home. The system design is geared specifically for accessibility to this population (Diamond, Shreve, et al., 2003). Assurance that a system is designed with the target population in mind is key to a successful telehealth program (Pramuka & van Roosmalen, 2009).

A third example is a Canadian-based model for decision making to assist nurses to select the most appropriate form of technology for telehealth services. The model is based upon six factors that incorporate evidence-based decisions in selecting an appropriate technology. This decision-making model is not a specific telehealth system, but rather it provides the nurses a method to choose the most relevant system for the best outcome of a client population (Hebert, Korabek, & Scott, 2006).

As telehealth system technology continues to advance, it allows various health professions to utilize evidence-based interventions for successful outcomes. As noted previously, medicine was the first profession recognized in this field. However, the medical field continues to have practitioners for and against the use of technology to access primary care providers and specialists. Some general practitioners voice distrust with telehealth systems and feel it may eliminate the office visit. On the other hand, there is also fear it will increase office visits that are

unwarranted because of false alarms by monitoring systems (Segar, Rogers, Salisbury, & Thomas, 2013).

Areas of medical specialty hold a higher satisfaction toward telehealth use than what Segar et al. (2013) found in the field of general medicine. McFarland, Raugi, and Reiber (2013) found that if the practitioner had experience with a telehealth system, the satisfaction rate increased. This study specifically targeted dermatologists and the use of store-and-forward images for consultation.

Another health care field highly involved in telehealth is nursing. One area in which nurses are involved is as care coordination managers for clients with chronic disease. The nurse can provide home health direct care coordination visits via technology and monitor client status on a daily basis. This area of nurse management provides a preventative approach that increases client outcomes while also increasing the client's overall positive perceptions of telehealth implementation in his/her home (Bendixen, Levy, Olive, Kobb, & Mann, 2009; Darkins et al., 2008; Demiris, Speedie, & Finkelstein, 2001; Houlihan et al., 2013).

A third profession involved in telehealth is psychiatry. Psychiatry services occur through multiple means of technology such as video conferencing and web-based chat sessions. One study by Morgan, Patrick, and Magaletta (2008) used video-based psychology and psychiatry sessions to serve an inmate population. The results of the study indicated positive outcomes similar to the control in-person groups with similar levels of satisfaction for the inmates and the providers. The

benefit of telemental health services was seen in the cost saving of transporting the inmate to a session and the improved safety of all involved.

A fourth health care profession to use telehealth services is physical therapy. Physical therapy services have proven effective in client populations with traumatic brain injury (TBI), total knee arthroplasty (TKA), and chronic obstructive pulmonary disease (COPD) (Forducey et al., 2003; Russell, Buttrum, Wootton, & Jull, 2011; Tousignant, Boissy, Corriveau, Moffet, & Cabana, 2009; Tousignant et al., 2012). Physical therapists in an urban setting were able to mentor and train a nursing home therapist in use of neurodevelopmental training procedures to affect positive outcomes for a client with TBI. The training through telehealth also provided mentoring support and further education of the nursing home therapist to advance his/her practice (Forducey et al., 2003). Direct treatment in intervention for conditions such as TKA and COPD also found positive outcomes and high satisfaction from the clients and physical therapy practitioners (Russell et al., 2011; Tousignant et al., 2009; Tousignant et al., 2012).

Telehealth services can provide positive and satisfactory outcomes for clients and practitioners in various health fields. The areas of medicine, nursing, psychiatry, and physical therapy are only four of multiple health care practices that utilize telehealth. One specific client population that has not been addressed is the older adult with dementia.

TeleOT

TeleOT is a specific type of telehealth that provides the delivery of OT

services through means of information and communication technologies (American

Telemedicine Association, 2010). As part of telerehabilitation, teleOT is gaining

evidence in effectiveness as an alternative means of service delivery. TeleOT can

provide evaluation, intervention, monitoring, supervision, prevention, and

consultation services in all areas of occupational therapy (American Occupational

Therapy Association, 2013a; World Federation of Occupational Therapists, 2014).

Benefits

It is imperative that OT practitioners further advance evidence-based teleOT

in all areas of practice to build support for reimbursement and licensure laws that

will allow OT practitioners to provide this type of service delivery. Multiple benefits

and limitations to teleOT services are reported in the literature and by professional

organizations such as WFOT and AOTA. The benefits include: access to services for

rural clients who are unable to travel; decreased time and cost; increased client

adherence to treatment plan; improved overall client outcomes; meet today's health

care needs; and client satisfaction (Bendixen et al., 2007; Cason, 2015; Forducey et

al., 2012; Linder et al., 2015; Sanford et al., 2007; Savard, Borstad, Tkachuck,

Lauderdale, & Conroy, 2003; Schein, Schmeler, Saptono, & Brienza, 2010).

The benefit of teleOT to provide services in rural areas, or to clients who may

not otherwise be able to travel, greatly increases OT contribution in health care

services. Improvement of access to services helps to decrease the cost and time associated with travel to a clinic or travel for the therapist to the home. Provision of services through information technology sources, such as phone and internet, allows the client to remain at home. This saves the cost and time of travel that is associated with a traditional appointment in a clinic (Barlow et al., 2009; Bendixen et al., 2009; Forducey et al., 2012). TeleOT services can also provide a means for clients who would not be able to access the services because of inability to travel or lack of access to any services in their area (Barlow et al., 2009; Savard et al., 2003).

Another significant benefit of teleOT services is to increase compliance to a recommended care plan. OT practitioners are involved as care coordinators in the Veteran's Administration. Through the Low ADL Monitoring Project (LAMP), OT provides monitoring intervention to veterans with chronic conditions. The outcome of this program has demonstrated positive results to increase compliance and effectively improve client outcomes (Bendixen et al., 2007). The constant monitoring provides increased access to health care to allow OT to collaborate with the client in the process of maintaining health in a habilitative role (Cason, 2015).

An additional benefit is to improve overall client outcomes. Research results in various different practice areas of OT have demonstrated no statistical difference in the outcomes of teleOT as compared to traditional in-person services (Barlow et al., 2009; Bendixen et al., 2007; Forducey et al., 2012; Linder et al., 2015; Sanford et

al., 2007; Schein, Schmeler, Saptono, & Brienza, 2010). This indicates teleOT services provide similar quality of service as traditional services.

TeleOT has the ability to increase occupational therapy's presence in contemporary health care by meeting the Institute for Healthcare Improvement's triple aim initiative. This initiative calls for improvement of the health care system performance (Berwick, Nolan, & Whittington, 2008). As Cason (2015) reports, the triple aim of health care encompasses the benefits of increasing access to health care and improving client outcomes. TeleOT services provide "opportunities for occupational therapy practitioners to integrate telehealth technologies when working with clients to increase access to services, improve health outcomes, promote health and wellness, enhance management of chronic diseases, and facilitate communication and care coordination" (Cason, 2015, p. 2).

Lastly, client satisfaction is a culmination of all the benefits of teleOT. Providing services that save time, save money, increase access to OT, and improve outcomes lead to improved client satisfaction. Measures of client satisfaction with teleOT services indicate high levels of patient satisfaction (Barlow et al., 2009; Schein, Schmeler, Saptono, & Brienza, 2010).

Limitations

Along with the benefits, one must not overlook the limitations that currently exist in delivery of teleOT services. The least of which is lack of overall evidence to support the efficacy of teleOT (Cason, 2015). Other limitations also include concerns

with licensure, reimbursement, technical issues, lack of client technology

knowledge, and concerns about privacy (Cason, 2014; Cason & Brannon, 2011;

Chumbler et al., 2010; Peterson & Watzlaf, 2015; Savard et al., 2003). These

limitations can lead to overall dissatisfaction with the use of technology.

Dissatisfaction leads to a lack of use of telehealth services in OT so clients and

practitioners do not benefit from the many positives of this service delivery model.

Currently, research is minimal to support the full use of teleOT services.

Further research is needed to provide higher level of evidence to support use of

teleOT services in all areas of OT service (Cason, 2015). This is especially true in the

area of OT services for dementia care. Current research to support teleOT for

dementia care is not available.

Tied closely to the lack of research to support the efficacy of teleOT services

is the limitation of consistent licensure laws and reimbursement. Licensure laws are

inconsistent from state to state ranging from being silent on the issue to requiring

increased standards of service provision (Calouro, Kwong, & Gutierrez, 2014; Cason

& Brannon, 2011). The lack of consistency can make it difficult to support expanded

services in all areas of the country. The inconsistency in licensure laws to regulate

teleOT services also leads to a low acceptance by health care payer services.

Reimbursement by most private insurance companies and Medicare is not available

for teleOT. Medicaid reimbursement varies by state (Cason, 2014; Cason & Brannon,

2011).

Another limitation of a system reliant on technology is technical issues. As provision of any service delivered through an information technology system, technical glitches occur which affect the outcomes of teleOT. One issue is the limited field of vision created when recording or viewing live images of a home environment. This limitation of the system results in a limited view of the home environment, which is not limited when physically present in the home (Sanford et al., 2007). Technology also creates issues of video quality and speed (Chumbler et al., 2010; Savard et al., 2003). In addition to speed and quality issues for synchronous teleOT, monitoring equipment may not provide complete, accurate data leading to misinformation (Charness, 2014).

A limitation related to technical issues is the ability of the user to interact effectively and efficiently with the technology. The client must be able to interact and troubleshoot technology glitches but that is not always the case. Some clients are not even comfortable with the ability to setup the technology for use in the teleOT session (Chumbler et al., 2010). Research involving individuals with mild cognitive impairment found evidence of difficulty interacting with everyday technology as cognitive status declined (Hedman, Nygård, Almkvist, & Kottorp, 2013; Rosenberg, Kottorp, Winblad, & Nygård, 2009). One would expect clients with dementia to have even greater difficulty interacting with technology.

Client privacy is an additional limitation of teleOT services. Advancements in technology are always increasing the capability of services but that comes with

concerns over how secure the technology keeps the client's information. The

constant streaming of information and increased users who have access to the

information are a cause for concern (Peterson & Watzlaf, 2015).

The benefits and limitations of teleOT services provide support for the need

to further advance our level of research that identifies a best practice model of

service provision. Existing research is minimal but does begin to provide evidence

to support the use of telehealth in OT and support the need for further evidence to

expand upon this current knowledge. Based upon the latest research, occupational

therapy does have a role in telehealth for direct service provision, consultative

service, and remote monitoring care coordination (Barlow et al., 2009; Bendixen et

al., 2007; Chumbler et al., 2010; Forducey et al., 2012; Sanford et al., 2007; Savard et

al., 2003; Schein, Schmeler, Holm, Saptono, & Brienza, 2010).

TeleOT for Clients with Dementia

A unique set of benefits and limitations of telehealth use arise when

specifically addressing a client population with dementia. The current amount of

telehealth service benefits and limitations for clients with dementia is less than ideal

(Windle, 2010). However, many different programs have proven successful in

allowing clients with dementia to remain in their home longer, even if a caregiver is

not living in the home (Buckley, 2006; Smith, Lunde, Hathaway, & Vickers, 2007).

When a caregiver is present, programs aimed directly at educating and supporting

the caregiver are available. The Alzheimer's Caregiver Support Online program is

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one example of a program aimed at caregiver education and support that is based online to reach caregiver's across the United States (Diamond, Glueckauf, & Loomis, 2003).

Other research has proven the effectiveness of delivering assessment measures through telehealth to clients with dementia. Loh et al. (2004) demonstrated interrater reliability of the Mini Mental Status Exam and the Geriatric Depression Scale from an in-person and telehealth based delivery. However, one must take the results with caution as the sample size was small and some clients demonstrated significant enough differences to heed caution in the accuracy of the results.

The literature available to provide evidence of the benefits and limitations of telehealth services in a variety of health care professions is growing. Care provided directly by physicians, nurses, psychiatrists, or physical therapists all have initial positive evidence for continued support of further research and development of telehealth programs. The area specific to delivery of health care through telehealth to older adults with dementia and their caregivers is still emerging. This area of telehealth service must continue to identify specific needs of this population and identify a best delivery method that can evolve with the client and his/her caregiver as the disease progresses.

Theory-Driven Objectives

Two major theories underpin the focus of this dissertation: person-environment-occupation model and the technology acceptance model. These two theories work together in concert to identify the client-centered needs of the population of interest and overall acceptance of technology to meet the identified needs.

Person-Environment-Occupation Model

The occupational therapy theory driving the focus of this dissertation study is the person-environment-occupation model (PEO)(Law et al., 1996). This occupational therapy theoretical model provides an understanding of the fit between a person, the environment, and occupation. Increasing the fit between these three constructs enhances an individual's occupational performance (Crist, Hershey, & Garrison, 2000). In the context of the dissertation study, the environment is the virtual context of teleOT. If the virtual environment is a poor fit for the practitioner or client, the intervention session is likely to fail. Assessment of the needs and perceptions of those involved can increase the fit between the person and virtual environment for a more successful outcome.

Technology Acceptance Model

Measurement of the individual's perception about the virtual environment and use of technology for teleOT services can be explained through the technology acceptance model (TAM). TAM is one of the most accepted models to provide

information to system developers about user acceptance of a new system. The basic constructs of TAM were developed by Davis (1986) based upon a psychological theory of behavior. The Theory of Reasoned Action (TRA) posits that a person's intent (or behavior) relates directly to a person's performance, attitude, and social influence. Davis utilized these constructs of TRA to develop the four main constructs of TAM. The four constructs are perceived ease of use (PEU), perceived usefulness (PU), attitude toward using the system (A), and actual system use (behavioral intention, BI).

The use of PEO to explain the occupational therapy perspective to optimize occupational performance in the virtual environment will provide an effective means to model development of a best practice model for delivery of OT services. The TAM model provides a guide to understand how to optimize the fit between the technology and the person. The technology must be fit to the person's needs to increase this fit. Optimizing the fit between the end-user and the virtual environment will increase the fit between the person and the environment in the occupation activity of participation in the teleOT services.

Significance of Proposed Research

The stress and burdens on a caregiver are a serious concern in our society today with the high numbers of people who provide informal care to those with Alzheimer's disease and related dementias (ADRD). If the person with ADRD moves into a nursing home or other institutional setting, the burdens and stress on the

caregiver maintain or increase (Almberg, Grafstrom, Krichbaum, & Winblad, 2000). The original dyad relationship now becomes a triad relationship consisting of the person with ADRD, the caregiver, and the health professional or social care worker. The formation of this new relationship within the nursing home continues to add stress and burden to the caregiver if they provide frequent visits and care (Adams & Gardiner, 2005).

Occupational therapy (OT) has played a vital role in provision of services to clients with dementia. OT practitioners can provide a level of care to assist in home modification, maximizing function, and promoting safety for the client and his/her caregiver in the home environment to allow the individual to stay at home longer (American Occupational Therapy Association, 2012). One area of OT to provide services to people with dementia is in home health. The OT practitioner goes into the home to work with the client and his/her caregiver in the natural environment (American Occupational Therapy Association, 2012; Rogers, Holm, & Stone, 1997).

The value of providing services in the home is the ability to affect change in the natural environment that is difficult to replicate in the clinic (American Occupational Therapy Association, 2012; Rogers et al., 1997). The next generation of home health care is home health provided virtually. The virtual context allows for services in the home without the OT or client traveling long distances. This also eliminates the difficulty of disrupting the client's normal routine. Disruption of routine can lead to an increase in behaviors caused by confusion. The virtual context

can promote occupation and decrease caregiver burden through access to different resources and support from professionals (Fok, Polgar, Shaw, Luke, & Mandich, 2009; Foran, 2011). Virtual delivery of OT services has a promising future to decrease caregiver burden by increased access to services.

As OT continues to expand its presence in the area of telehealth, further research will support the efficacy of teleOT as a service delivery alternative to the traditional in-person care. There is a future for teleOT services as supported by professional groups such as WFOT and AOTA in all areas of OT, including the area of dementia care. Currently, OT lacks the evidence to support use of telehealth to provide services to clients with dementia, but other health care professions are beginning to support the efficacy of telehealth in dementia care (Buckley, 2006; Smith et al., 2007; Windle, 2010). Combine this support with the efficacy of OT service in traditional in-person dementia care, and it provides support for continued research into this area of OT.

CHAPTER III

A SURVEY EXAMINING THERAPISTS' PERCEPTIONS OF TELEREHABILITATION

A Paper Submitted For Publication in the *International Journal of Telerehabilitation*

Ranelle Nissen

Health care providers use technology as a method to offer more efficient and convenient care to their clients. Telehealth is one use of technology to deliver health care services from a distance. Telerehabilitation (TR) is the use of telehealth by occupational therapists, physical therapists, and speech-language pathologists to provide rehabilitation services to clients (American Telemedicine Association, 2010). TR services are as effective as traditional in-person therapy to boost a client's self-efficacy (Finkelstein, Lapshin, Castro, Cha, & Provance, 2008; Kairy, Lehoux, Vincent, & Visintin, 2009), independence (Laver et al., 2013; Sanford et al., 2006; Schmeler et al., 2010) and confidence levels (Justice, 2010). Evidence also exists to support that telehealth is a cost-efficient method of service delivery in the rehabilitation setting (Bendixen et al., 2009; Tousignant et al., 2015) and can be a valid method to deliver effective rehabilitation services.

However, not all health care professionals accept telehealth. Negative perceptions of telehealth can lead to a practitioner dismissing telehealth as a delivery method due to concerns of compromising the quality, effectiveness, and

ethical standards of service (Carlisle & Warren, 2013; Levy & Strachan, 2013; Segar et al., 2013). As such, practitioners who do not view telehealth as an appropriate delivery method will not implement telehealth services. The purpose of this study was to determine OT, PT, and SLP practitioner perceptions of TR.

Background

Rural and remote regions lend unique challenges to providing service because of limited resources, limited access to specialized services, and additional time and cost required for travel by the practitioner or the client. Individuals who live in rural regions may not have the same access and level of care afforded to individuals who live in more populated regions of the country (National Rural Health Association, n.d.).

Therapy practitioners in occupational therapy (OT), physical therapy (PT), and speech-language pathology (SLP) provide health care services that require a skilled level of clinical knowledge. Each profession has required standards of education that allow the practitioner to enter practice with the knowledge to provide skilled level of care to each client (Accreditation Council for Occupational Therapy Education, 2012; Commission on Accreditation in Physical Therapy Education, 2016; Council on Academic Accreditation, 2014). Each client requires a plan of care unique to his/her needs. The practitioner's clinical knowledge provides for the ability to adapt the basic tenets of OT, PT, or SLP to the client's unique needs to affect a positive outcome (American Occupational Therapy Association, 2010b;

American Physical Therapy Association, 2013; American Speech-Language-Hearing Association, 2004).

Ethical standards of each profession call for equality of services to all individuals and this includes those living in rural regions (American Occupational Therapy Association, 2015a; American Physical Therapy Association, n.d.; American Speech-Language-Hearing Association, 2016). To uphold the ethical principles of the profession, practitioners must find ways to overcome these challenges to provide the same level of care and opportunity to access services. One method to reduce this gap in services and decrease the burden placed on the practitioner or client is telehealth. Telehealth provides a means to deliver the same quality of care but through means of technology to close the gap created by the geographical distance in rural areas (Agostini et al., 2015; American Telemedicine Association, 2010; Crotty et al., 2014; Forducey et al., 2012). Telehealth can provide the means to access the necessary services for clients in need of rehabilitation, monitoring of chronic conditions, and specialized services (American Telemedicine Association, 2010, 2012).

OT, PT, and SLP researchers have identified multiple areas telehealth can be an effective means of providing services. Services such as remote monitoring, video-conferencing, and emailing have been shown to be effective to provide services to children, adolescents, adults, and older adults (Bedra & Finkelstein, 2015; Bendixen et al., 2009; Dallolio et al., 2008; Isaki & Farrell, 2015; Jenkins-Guarnieri, Pruitt,

Luxton, & Johnson, 2015; Kairy et al., 2009; Tindall & Huebner, 2009; Tousignant et al., 2011). However, there are certain elements that need to be assessed for therapy services to support telehealth as an effective delivery method.

One element, which was the focus of this current study, is practitioner perception. This is an important element because the practitioner is responsible for the management of the technology system used in telehealth. If a practitioner does not perceive telehealth as an effective method of service delivery to his/her clients, the practitioner will not utilize telehealth (Holden & Karsh, 2010; Kuo, Liu, & Ma, 2013; McFarland et al., 2013). This perception is important because the practitioner must utilize clinical reasoning to determine whether or not telehealth is an effective means to uphold the ethical principle of providing standard of care equal to that of traditional in-person services (McFarland et al., 2013). If the practitioner does not perceive the use of telehealth as an effective means to provide services at that standard of care, the practitioner will resist telehealth as a delivery method (Kuo et al., 2013).

Current evidence provides overall positive support for telehealth by practitioners in various health care fields. This evidence derives mainly from practitioners who currently utilize telehealth to provide services to clients. Evidence indicates that the use of telehealth has a positive correlation with a positive practitioner perception of telehealth (Kuo et al., 2013; McFarland et al., 2013).

Purpose

This study examined one upper Midwestern state with a high percentage of rural communities. Nearly 43% of this state's population of this state reside in rural areas (U.S. Census Bureau, 2010). Therapy practitioners in states with a higher percentage of rural areas face challenges to provide services to rural clients. In order to help a state move forward with today's technological advances and gain medical coverage for its providers when using TR services, there is a need for further research to gather what services are currently offered and to determine the therapists' perceptions of using these services. There is a need to determine what, if any, value TR services can or does provide for practitioners and clients in a rural state in order to provide evidence to support increased access and reimbursement of TR. Therefore, the questions guiding this study were: (1) What TR services are currently provided in one rural, Midwest state? and (2) What is the perception of the utility of TR for use to deliver occupational, physical and speech therapy services to clients in that state?

Methods

Design

This study utilized a survey design to obtain the quantitative date. This design allowed for the efficient collection of a large data set. The study utilized a questionnaire with a structured set of questions allowing participants to complete

and return data anonymously and at their own convenience (Portney & Watkins, 2009).

Participants

Participants were a licensed or otherwise credentialed practitioner in physical therapy, occupational therapy, or speech-language pathology, practicing in the state of interest, and had a physical mailing address on file with the respective licensing board.

Data Collection Tools

The development of the questionnaire was based on previously validated questions that assess constructs of the Technology Acceptance Model (TAM) (Davis, 1986). The TAM has shown to be a reliable method that takes into account how perceived usefulness (PU) and perceived ease of use (PEU) affect one's attitude towards using technology. The individual's attitude, in turn, directly affects one's behavioral intention (BI) to use the technology (Chau & Hu, 2002; Davis, 1986; Holden & Karsh, 2010; King & He, 2006).

The TAM questions utilized to assess PU and PEU were scored based upon a 5-point Likert scale from strongly agree (1) to strongly disagree (5). Scoring for negatively worded items was reversed. PU was determined upon eight survey questions and PEU was determined upon ten survey questions (Davis, 1986). PU scores above 24 indicate a more negative perception of TR, while scores below 24 are associated with a more positive perception of TR. Furthermore, PEU scores

above 30 indicate a more negative perception of TR, while scores below 30 are associated with a more positive perception of TR.

The questionnaire also included questions to collect demographic information, current use of TR, and perceived level of knowledge about TR. Demographic information collected included the therapist's professional credentials, years of experience, current practice setting, primary county of practice, age, and gender.

Data Collection Procedures

All potential mailing addresses were obtained from the respective licensing boards. The questionnaire was originally mailed to 1,774 practitioners licensed to practice OT, PT, or SLP in the state of interest. Nine were returned for incorrect address. Three weeks after the original mailing, 1,765 reminder postcards were mailed. All potential participants received a reminder postcard because no identifying information was collected to exclude received responses from the reminder mailing.

<div align="center">

Data Analysis

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SPSS version 22 was used to analyze all data collected. Descriptive statistics, frequency counts, and means, summarized the demographic data, use of TR, perceived knowledge of TR, and PU/PEU of TR. One-way ANOVA analysis was conducted to identify significant differences in perception between practitioners grouped by level of knowledge of TR, practitioner type, and years of experience in

practice. An independent t-test was used to identify interaction effect between perception and use of TR in practice (Portney & Watkins, 2009).

Results

A total of 335 questionnaires were returned for analysis. Twenty-four were excluded due to incomplete data for a final inclusion of 311 responses. The final response rate was 17.6%. Participants who completed the questionnaire were primarily PT practitioners (39.5%), female (84.6%), had 16-20 years of practice experience (19.3%), and worked in pediatrics (34.7%) (See Table 1). Participants identified they worked in the following practice areas: pediatrics (34.7%), adults (2.3%), older adults (17.7%), orthopedics (11.9%), mental health (1.9%), higher education (0.6%), physical disabilities (1.6%), outpatient (6.8%), administration (0.6%), ergonomics (0.6%), or multiple areas (21.2%).

Of the participants, 10.3% (n=32) perceived they are knowledgeable about TR, 34.1% (n=106) reported that they are somewhat knowledgeable, while 55.6% (n=173) reported having no knowledge of TR. Similarly, only 11.0% (n=8) of OT practitioners, 8.9% (n=11) of PT practitioners and 12.2% (n=14) SLP practitioners utilize TR in practice. Of the 33 practitioners who utilize TR, 54.5% (n=18) use it with more than 50% of their caseload (4.1% OT, 4.9% PT, 6.9% SLP). Analysis of all 311 responses indicated an overall positive PU (22.49 ± 6.26) and positive PEU (28.27 ± 5.16) (See Tables 1 and 2).

Table 1

Participant Characteristics

	N = 311
Practitioner (n, %)	
Occupational Therapy	71 (22.8%)
Physical Therapy	123 (39.5%)
Speech-language Pathology	117 (37.6%)
Age (n, %)	
20 – 25	9 (2.9%)
26 – 35	79 (25.4%)
36 – 45	93 (29.9%)
46 – 55	89 (28.6%)
56 – 65	33 (10.6%)
≥ 66	4 (1.3%)
Not stated	4 (1.3%)
Gender (n, %)	
Female	263 (84.6%)
Male	48 (15.4%)
Years of Experience	
1 – 10	102 (32.8%)
11 – 20	102 (32.8%)
21 - 30	75 (24.1%)
≥ 31	32 (10.3%)

Table 2

Participant Characteristics by Profession

	OT	PT	SLP
	N = 71	N = 123	N = 117
Age	43.31 ± 8.58	43.07 ± 9.64	41.14 ± 11.82
Gender (n,%)			
Female	64 (90.1%)	82 (66.7%	117 (100%)
Male	7 (9.9%)	41 (33.3%)	0 (0%)
Years of Experience	16.96 ± 8.10	17.33 ± 9.37	16.34 ± 11.50
PU	22.65 ± 6.79	23.23 ± 5.87	21.61 ± 6.27
PEU	28.03 ± 4.78	28.89 ± 4.62	27.77 ± 5.85

One-way analysis of variance (See Tables 3 & 4) and independent t-tests (See Table 5) were conducted to determine differences of PU and PEU between groups ($\alpha \leq 0.05$). Three groups were found to have significant differences on PU and PEU of TR. Practitioners who perceived they have more knowledge of TR have significantly more positive PU and PEU ($F(2,308) = 39.24$, $p < 0.001$; $F(2,308) = 16.40$, $p < 0.001$). Post-hoc testing using Bonferroni *t* identified significant differences at all three levels of perceived knowledge. Additionally, practitioners who use TR have a significantly more positive PU and PEU (t (309) = -7.73, $p < 0.001$; t (36.78) = -3.03, p=0.004). In addition, experience was determined to make a difference on PEU ($F(3,307) = 2.78$, p = .041). Post-hoc Bonferroni *t* identified practitioners with less

31

than 10 years of experience (27.28 ± 4.57) had a more positive PEU than those with

11 – 20 years of experience (29.30 ± 5.09) (see Tables 3 – 5).

Table 3

One-Way Analysis of Variance of Perceived Usefulness

Source	df	SS	MS	F	P
Knowledge of TR					
Between groups	2	2468.45	1234.22	39.24	.000
Within groups	308	9687.24	31.45		
Total	310	12155.69			
Practitioner					
Between groups	2	159.95	79.97	2.05	.13
Within groups	308	11995.74	38.95		
Total	310	12155.69			
Experience					
Between groups	3	149.03	49.68	1.27	.285
Within groups	307	12006.66	39.11		
Total	310	12155.69			

Table 4

One-Way Analysis of Variance of Perceived Ease of Use

Source	df	SS	MS	F	P
Knowledge of TR					
Between groups	2	793.72	396.86	16.40	.000
Within groups	308	7451.59	24.19		
Total	310	8245.31			
Practitioner					
Between groups	2	80.19	40.10	1.51	.222
Within groups	308	8165.12	26.51		
Total	310	8245.31			
Experience					
Between groups	3	218.36	72.79	2.78	.041
Within groups	307	8026.95	26.15		
Total	310	8245.31			

Table 5

Independent t-test of Perceived Usefulness & Ease of Use

| | Use TR in Practice | | | | |
	Yes	No			
PU	15.18 ± 5.46	23.35 ± 5.77	-7.73	309	.000
PEU	25.21 ± 6.27	28.63 ± 4.90	-3.03	36.78	.004

Note. The lower mean score indicates perception in the positive direction.

Discussion

The results of this study indicate that both knowledge and use of TR by occupational, physical, and speech-language pathology therapists are limited (See Tables 1 and 2). The overall perception of the usefulness and ease of use of TR trended toward the positive for all three professions; however, the range of the scores around the mean may indicate a more neutral position. Other studies have found similar results of overall positive perceptions of telehealth use by other health care professions (Levy & Strachan, 2013; Singh, Pichora-Fuller, Malkowski, Boretzki, & Launer, 2014).

After analyzing the data obtained from this study, the use of TR in practice significantly increases practitioners' PEU (p < 0.001) and PU (p<0.001). These results indicate that when therapists utilize TR, they can potentially become more comfortable with the technology and therefore implement these services in the

appropriate situations. The therapist's comfort level can also lead to the client being

more confident in the therapist's ability to administer the most beneficial services

for the client's needs.

In addition, the results indicate that the PU and PEU affect therapists'

attitudes, which ultimately influences their BI, based on the TAM principles.

Through the promotion of TR, therapists may see the value of these services, which

could potentially change their perceptions and attitudes allowing for widespread

implementation of these services among the various disciplines in this particular

locale.

TR can be a valuable tool for therapists to use as a means of an alternative

delivery of services to clients. Current literature supports an overall positive

practitioner perception for the benefits of telehealth (Carlisle & Warren, 2013; Levy

& Strachan, 2013; Singh et al., 2014) yet, challenges to the use of telehealth have

also been reported (Hill, Theodoros, Russell, Ward, & Wootton, 2009; Hoffmann &

Russell, 2008; Lade, McKenzie, Steele, & Russell, 2012; Sanford et al., 2007). Thus, it

is important for the therapist to ensure that each client's situation is evaluated

before considering the use of TR. In addition, it is essential that health care

providers understand the benefits and challenges when considering this service

delivery method for clients.

The limitations of this study are important to consider when analyzing the

results and implications for practice. Since only practitioners licensed in the one

state of interest participated in this study, the results are not generalizable to other areas throughout the country. In addition, the survey utilized in this study was based on therapist self-report.

Conclusion

The central aim of this study was to evaluate OT, PT, and SLP practitioners' perceptions of TR use in a rural state. The main findings reveal that those who currently utilize TR in practice have a more positive perception than those not utilizing this service, indicating that after using TR, practitioners adopt a more positive perception of the technology. Although TR is being used minimally at this time in the state of interest in this study, it can be concluded that if this service can be increasingly implemented in the appropriate situations, there is potential for therapists to reduce the cost associated with travel and provide evidence to support reimbursement of services through third-party payers (Cason, 2015). Future research should focus on reimbursement for TR, as well as state licensure across state borders to widen the scope of service.

CHAPTER IV

PERSONS WITH DEMENTIA AND THEIR CAREGIVERS' PERCEPTIONS ABOUT

TELEOT

Dementia is a progressive disease that leads to a decline in cognition and functional performance. Individuals diagnosed with Alzheimer's disease and related dementias (ADRD) require caregiver assistance as it progresses. Often this leads to nursing home placement to provide a higher level of assistance than a caregiver can provide in the home (Doble, 2009; Lewis, 2003).

An estimated 15.9 million unpaid caregivers in the United States care for individuals with ADRD (Alzheimer's Association, 2015). Caregiving puts an increased stress and burden on the unpaid caregiver (Ford, Goode, Barrett, Harrell, & Haley, 1997). The burden felt by caregivers as ADRD symptoms progress can lead to role conflicts, depression, and decline in physical health of the caregiver (Adams, McClendon, & Smyth, 2008; Pinquart & Sorensen, 2004; Sanders, Ott, Kelber, & Noonan, 2008; Stephens, Townsend, Martire, & Druley, 2001). Occupational therapy (OT) can provide services to the person with dementia and the caregiver to decrease this burden (American Occupational Therapy Association, 2012; Ciro et al., 2013; Gitlin et al., 2005; Lam et al., 2010).

Traditionally, OT services are delivered in-person. An emerging method of delivery for services is through telehealth (American Occupational Therapy Association, 2013b). Though OT services through telehealth have proven effective (Asano et al., 2015; Chumbler et al., 2012; Hermann et al., 2010), there is no research to date assessing the perceptions of individuals with dementia and their caregivers about using telehealth as a means to access OT services. The client's perception is an important factor to assess prior to development and implementation of a telehealth protocol for delivery of services (Demiris et al., 2010; Pramuka & van Roosmalen, 2009).

Technology and Cognition

An important area of consideration for this study is how a person's cognitive performance may affect ability to interact with technology for receipt of services. Dementia primarily impacts cognition (Alzheimer's Association, n.d.). This may mean that as the individual's cognition declines, further steps will need to be taken to assure continued ability to access services through means that are tailored to that individual's cognitive ability (Diamond, Shreve, et al., 2003). This includes incorporating the caregiver to provide assistance and assure carry over of services after each session in the same way as traditional in-person service delivery (American Occupational Therapy Association, 2012).

Providing different levels of services may also be a method of modification according to the various needs of the client. Initially, the individual may be able to

participate in face-to-face telehealth services but then need to modify or add in

telemonitoring services as the individual's needs change (Buckley, 2006; Windle,

2010). The purpose of this study was to assess perceptions of teleOT services and

technology needs of persons with dementia and their caregivers.

Methods

Design

A mixed-methods design was used to collect data for this study. The use of

both quantitative and qualitative data were treated equally and collected

concurrently in a concurrent triangulation design (Corcoran, 2006).

A mixed-method design approach to the collection of data from individuals

with dementia and their caregivers increases the quality and credibility of the data

(Patton, 2015a). This method allows the researcher to validate the data collected

from other traditions. Collecting the data simultaneously puts neither data set as

primary so it allows the data to develop independently of the other (Corcoran,

2006). The Technology Profile Inventory (TPI) was used to collect quantitative data

to identify participants' perceptions of computers and the Internet and that was

compared with the qualitative data collected in focus group interviews and through

a survey with open-ended questions.

Participants

Participants were older adults with dementia and their adult, unpaid

caregivers who live in one upper Midwestern state. Caregivers were included if they

self-identified as a caregiver for someone with dementia. Persons with dementia were included if they self-identified as diagnosed with dementia and scored 10 or greater on the Montreal Cognitive Assessment. A score of 10 is the minimum cut-off for moderate cognitive impairment (Nasreddine, 2016). Only individuals who self-identified as a caregiver of a person with dementia were included in the survey form of data collection.

The focus group recruitment occurred through identified agencies providing support services to persons with dementia and their caregivers. This included the Alzheimer's Association local state chapter and an adult day program at one facility. Recruitment information was provided to each identified resource through a flyer and/or personal communication. Recruitment included a brief presentation of the proposed study to key personnel at each site through a phone conference. Further recruitment was done through invitation to speak at caregiver support groups and snowball sampling. Informed consent for participation in the focus group was granted through signed consent or assent, as appropriate for persons with dementia. Participants who participated in the survey were provided a consent statement. Submission of the survey was confirmation of their consent to participate.

Each focus group consisted of a minimum of two participants. This is not consistent with accepted standard of five to eight participants (Krueger & Casey, 2015); however, due to low and inconsistent recruitment numbers, a minimum of

two individuals was accepted to allow participants to participate without extended periods of time between initial recruitment and completion of the interview. Five adults participated in the focus groups and one survey was collected for final analysis. It is difficult to ascertain the exact number of participants required a priori to reach saturation and redundancy of themes. Creswell (2013) estimates a total sample size of 20-30 to establish a complete saturation of themes for grounded theory approach. Krueger and Casey (2015) recommend a minimum of three to four focus groups with an ideal focus group size of five to eight participants. However, due to the nature of this study as part of a dissertation, a smaller total sample size was accepted for the feasibility of completion.

Instruments

An additional form was used to collect demographic data. Demographic data collected included age, gender, self-identification as a person with dementia or caregiver, county of residence and level of caregiving received/provided (see Appendix B).

The TPI collected data about the participant's attitude toward technology. Participants completed the TPI prior to the focus group. The TPI was included as part of the online and paper surveys. The TPI is a 30-item questionnaire (see Appendix C). It is a valid and reliable measure of confidence, approval, and interest toward computers and the Internet (Spence, DeYoung, & Feng, 2009). The

participant ranks agreement or disagreement with each statement on a 5-point Likert scale of 'strongly disagree' to 'strongly agree.'

The focus group was conducted utilizing an interview guide (See Appendix D). Focus group data were recorded and transcribed verbatim. The group facilitator provided an initial overview consisting of basic information about OT and teleOT services. Consistency of the facilitator and observer in the interview guide provided increased confidence of comparison of the data between groups by assuring the same topics were covered in each group (Patton, 2015b).

The survey was provided as an optional method of participation. It was provided in electronic, hard copy and online versions. It consisted of the TPI and questions that were developed around the interview guide used for the focus group interviews (See Appendix D). Use of the same questions and survey instrument allowed for attainment of comparable data for consistency with data analysis.

Procedures

The primary facilitator had prior experience in focus group facilitation and qualitative interviewing. The facilitator and co-facilitator conducted a trial focus group with graduate students to increase experience in conducting and validation of the interview guide for this study.

The primary investigator facilitated each of the focus groups. A second observer assisted the facilitator. The observer took field notes and assisted in the facilitation of the focus group as needed. Field notes were taken to enrich and

validate the transcribed interviews. The observer was a graduate level occupational therapy student trained by the primary investigator in the quality methods of focus group facilitation.

Each focus group lasted between 30 to 60 minutes. The primary purpose of the focus group was to identify participants' perceptions of teleOT services and technology needs from a system to receive teleOT services. Qualitative analysis identified themes through a grounded theory approach.

Data Analysis

Quantitative analysis. Data analysis of the demographic data reported the frequency of the data collected. Descriptive statistics provided an overview of respondents' ages, hours of daily caregiver assistance received/provided, and factor scores of confidence, approval, and interest in computers and the Internet.

Qualitative analysis. All focus group interview data were transcribed verbatim. The transcribed data were coded by the method of open and axial coding (Corbin & Strauss, 2008). The first step was to review the problem statement and research questions that guided the interview. The second step was to complete an initial read-through of the full transcript for familiarization of the content. In the tradition of open and axial coding, the third step in the process began with initial open coding process of identifying concepts and grouping those concepts into categories. The final step was to complete axial coding to identify main themes based upon identified relationships between the categories.

The initial process of coding was completed using Microsoft Word. Initial open coding process to identify concepts from the data was completed and reports of the concepts and the corresponding data were pulled from each coders results. Further coding was based on these reports using Microsoft Word and coder review.

Triangulation was used to improve data quality and credibility. The two investigators present at each focus group independently completed the full coding process. One additional reviewer independently coded the data for a total of three coders. Comparison of codes and themes developed by each reviewer were discussed for agreement of final codes and themes.

The final codes were compared to the quantitative data for comparison of matching perceptions about the use of technology (Patton, 2015a). Comparison of the quantitative and qualitative data was done through the use of side-by-side comparison. This method of comparison left each data set intact and allowed for pure comparison of the data to demonstrate agreement or disagreement of findings (Creswell & Plano Clark, 2011).

Results

Demographics of Participants

The interviews were conducted with five females and one male. There were five caregivers and one person with dementia who qualified for study inclusion. The

mean age of the caregiver participants was 79.40 ± 7.23 years. The age of the person
with dementia participant was 78 years. The range of caregiver assistance
provided/received was from 2 – 10 hours. See Table 6 for complete demographic
data.

Table 6

Participant Characteristics

Participant	Gender	Age (years)	Caregiver Assistance (hours/day)
0116	Male	78	2
0216	Female	78	2
0317	Female	71	5
0417	Female	78	4.5
0517	Female	79	7
0617	Female	91	10

Quantitative Results

The results of the TPI indicated the participants had a general positive
attitude toward computers and the Internet (3.60 ± 0.59), with a higher score
indicating a more positive perception. The TPI scoring further breaks down into
three categories of confidence, approval, and interest. All three categories had
average scores that trended toward the more positive (3.61 ± 0.52; 3.93 ± 0.65; 3.25

± 0.92). Although the total and category scores trended toward the positive, it is important to note that the range of scores varied in all areas from the negative or neutral to positive. See Table 7 for full range of scores.

Table 7

Technology Profile Inventory Scores

Category Score	Minimum	Maximum	Mean	SD
Confidence	3.00	4.40	3.62	0.52
Approval	3.00	4.60	3.93	0.65
Interest	1.80	4.30	3.25	0.92
Total	2.87	4.30	3.60	0.59

Note. A higher score indicates a more positive perception.

Qualitative Results

The results of the five interviews and one survey demonstrated similarities and differences for each participant's experience with dementia and use of technology. The results are identified in three domains with themes and subthemes for each domain (see Table 8).

Table 8

Display of Thematic Findings

Dementia Journey	Skills for Technology Use	Perceptions of Occupational Therapy
Theme 1: Awareness	Theme 1: Current usage • Format • Content	Theme 1: Limited knowledge
Theme 2: Challenges • Role change • Symptoms • Loss	Theme 2: Perception of technology • Past • Future	Theme 2: Appreciate role of OT • Gaining knowledge • Identifying need
Theme 3: Adaptive strategies • Caregiver • Person with dementia • Dyad		

Dementia journey. The dementia journey is the caregiver's and person with dementia's experience with dementia. The caregivers and persons with dementia described this journey as a temporal transition from having an initial awareness of the disease, working through challenges as the disease progressed, and identifying adaptive strategies for the management of daily routines.

Awareness. The caregivers identified a moment of awareness when they realized there was a problem with the person with dementia (PWD). This moment

was the first time the caregiver identified a serious issue with the PWD's memory.

Quotes from participant's 0216 and 0317 exemplify this moment of awareness:

> "...the first encounter that there really was a need was when he was going back to his home city ... and didn't know where to exit, and there are only two exits, and when we exited, we were going to a common place that we go every year for a gun show."

> "When he drove to church one day and didn't come back because he couldn't find his way back home. And, so after the third time of that happening, the sheriff had to bring him home, and we decided to take the keys away and uh and the VA – did a bunch of tests to diagnosed him with dementia."

It also became a point of awareness of past issues that had gone unnoticed.

Participant 0216 stated:

> "... as I looked back I could see many different signs that I was not aware of, and that is probably quite common."

This theme of awareness was also apparent after the diagnosis of dementia.

Both the caregiver and the PWD became aware of the person's strengths and

limitations. This awareness allowed the dyad to identify a new acknowledgement of

the PWD without losing sight that the person had not lost his/her true self.

Participant 0216 reported how her spouse had identified an awareness that he was

still himself:

> "He was interviewed on, on uh, on TV at the, the Alzheimer's Walk, and his last statement was just precious because he said at the end, he just said 'and I'm still ... inside." And, I think we, as others, should realize, respect them as a

human being. They are not someone to be ignored in any way, shape, or form."

Participant 0216 also identified how early on she made the awareness of the disease as the root cause of difficulties:

"As a caregiver, uh, I just, I decided it is a brain injury or disease and he's not at fault for things he cannot do anymore, things he cannot remember."

Challenges. A second aspect of the dementia journey was the challenges faced by the caregiver and PWD. Role changes, symptoms, and loss were three main challenges identified.

Role changes. One challenge faced by the caregiver is the change in roles. In the case of all the participants in this study, the role change meant the change from a spousal relationship to one of a caregiver-care receiver relationship. This change in roles brought many challenges to the participants. The caregiver participants of this study identified challenges of increased worry, making it on their own, and a new role of continuous caregiver to their spouses. Participant 0317 discussed what the change in roles has meant to her:

"Well, it, uh, I mean you have to take things as they are, you can't always do what you really want to do. I mean you, you don't have a person that can be a companion for you and do the same things that you did before."

Symptoms. A second challenge identified by the participants was the symptoms of dementia. These symptoms included lack of motivation, problem with making choices, difficulty with transitions, motor-planning problems, and memory difficulties. These problems would vary by day so the caregivers found themselves adjusting to these challenges on a daily basis dependent upon what symptoms were more prominent that day. Participant 0417 discussed how motor planning was a challenge that changed their routine:

> "so it's just easier to stay there than to get in the car, and drive to a place, get … in the car, and get … out of the car, walk into the café, and you know, it's just too much of a chore anymore."

Loss. The third challenge expressed by the caregivers in this study was the sense of loss. The caregivers expressed loss of previous relationships and life goals. Loss of relationships was felt in the spousal relationship, family, and friends. There was a change in the spousal relationship because the spouse they had known was no longer the same person. The loss of family came in the form of a changed relationship with family members who did not understand everything the dyad faced on a daily basis. The loss of friends was an ending of friendships due to the changing needs of the dyad. The loss of life goals also came from this same change in needs of the dyad. The caregiver faced a different future than what had been previously envisioned by the spousal couple.

Participant 0417: "People who we thought were our friends, you know, are they there for us? Well, no, probably not."

Participant 0617: "… saddened, by the loss of sharing life experiences, travel, sharing happenings, etc, as we knew them before dementia."

Adaptive strategies. All the participants in this study identified methods by which to manage the many challenges they faced on a daily basis and in the long-term progression of the dementia. These strategies were modifications of behavior, activities, or routines by the caregiver, the person with dementia, or both.

Caregiver. One method of adaptive strategy reported by the caregivers was to change their own behavior. This included strategies of how the caregiver reacted to the person with dementia, reminding oneself the symptoms are the dementia, and modifying behavior based upon poor results with a particular approach. The caregivers also identified ways to adapt how they communicated. One strategy reported was to learn to read the nonverbal communication of the person with dementia. This method assisted the caregiver in better identifying the needs of the person with dementia. A third strategy identified by the caregivers was to find means to decrease their stress and sense of burden. These strategies include physical activity, entertainment, paid employment, volunteer work, leisure pursuits, prayer, and respite services.

0317: "I just, I do work part time, it's more of a work for me as my therapy."

0417: "I go to church and water my plants, and they don't talk back. And I would tell my pastor that and he says "Well, I'll talk to ya anytime you come!" Okay! But, you know I like to bake so, you know, I bake bread."

Person with dementia. Strategies implemented for the PWD were identified as being implemented by the caregiver and the PWD. The caregiver would implement strategies that included activities to challenge cognition, encourage independence, and modify tasks. The PWD also implemented strategies such as self-electing to no longer drive and keeping a sense of humor. These strategies encouraged the PWD to maintain a sense of self and choice during the progression of the disease process. Participant 0116 described how he has modified the task of a phone conversation so he can recall it at a later time:

"Yeah, I've got a pad, and I wrote out. For example I put "call from ... and the date" and I may not remember exactly what we took-talked about, but it's not important because we did it and then I've, it, perhaps it will jog my memory or it just reassures me that, yeah I've heard from, you know ..., I've heard from ..., stuff like that."

Dyad. The caregiver and the person with dementia also work together on adaptive strategies. The strategies implemented spoke to the spousal relationship of each of the participants. The choice to plan for the future while the person with dementia could still participate in this process was identified as an important strategy. Two participants chose to pre-plan for future events by choosing a nursing

home, completing a will, and planning a funeral shortly after the diagnosis of

dementia.

> 0216: "…we looked at our end of life directive. We looked at uh, burial or, are, what we were going to do. We got that settled. Um, we explained it to our, all of our children what we – what our plans were. Um, then I went, or we went together, 'cause he's part of this, always. And we went, oh I don't know how many nursing homes and facilities and toured them with other tours and my own tours and speeches at different ones to learn about the memory care at different ones and chose the one that I thought was best for both of us as far as geographical location and the type of care that was provided."

Another strategy identified was the connection between the couple through

continued conversation and joint activities. The participants reported keeping

communication as an important aspect to keep their relationship close and to assure

the person with dementia was included in decisions when possible. Joint activities

also allowed the dyad to continue to maintain a relationship outside of the caregiver

– care receiver relationship.

> Participant 0317: "I take him out to places too like, before, I'll take him out to the farm, where he used to farm at, and you know he gets to see things. I'll take him out to relative places. He still likes to play pinochle."

Skills for technology use. The skills for technology use domain

encompasses the participants' current use and perception of technology. The use

and perception of technology varied between participants. It varied from minimal

usage of occasional use of a computer for email to that of daily use of multiple

formats of media. It was apparent that the more the technology was utilized on a daily basis, the more positive the perception the participant had of the utility of technology.

Current usage. All of the participants reported the use of a cell phone for communication. Most reported as least an occasional use of the internet to Google specific search terms related to health care concerns. Beyond that, the format and content of usage varied among all the participants.

Format. Participants reported using various forms of technology. These forms included cell phone, internet, computer, tablets, television, and GPS. Participants reported using platforms such as Google, Skype, Facebook, Twitter, and text messaging on cell phones, computer, or tablets.

Content. Regardless of the type and frequency of the technology used, participants utilized technology for entertainment and/or as a resource for health care education. Participants reported the use of technology to access entertainment such as games and videos. They also used technology to gather information about concerns related to dementia and other health care issues. The ability to search the internet to find information was reported by five of the participants. This use of technology gave the participants instant access to information at the moment it was needed.

Participant 0216: "Well you can just Google it and get resources that you can. And then I have a lot of people that feed me information where I can get it and get further."

Perception of technology. The participants' perception of technology was categorized into perception of what they had used in the past and their perception of potential use in the future.

Past. All the participants had used some form of technology for entertainment or health care resources. There was agreement among the participants that cell phones were a positive form of technology that provided them with positive access for communication and Internet. Technology provided a positive form of entertainment as a stress relief from caregiving burden. It also provided a means for communicating with family members. However, some experiences were not as positive. There were technical issues that required additional assistance from either a paid technician or family members who were not always available to assist. Participant 0317 reported that technology was good, but 'unending.'

Future. The overall positive experiences with technology in the past appeared to keep the participants' minds open to the potential for technology use through telehealth. When asked about their perception of telehealth, the participants initially were uncertain of how technology could be used to receive health care services. With further explanation about telehealth, the participants

were provided multiple suggestions of how technology could provide health care services in the home. Participants reported being willing to use platforms such as videoconferences, in-home monitoring systems, and asynchronous communication. Participant 0216 discussed how technology is moving forward and the need to be open to learning it:

> "And you know, if we don't embrace it and use it for, you tell it what we're going to use it for, you know, why, that's life! It's kind of like I'm still not going to ride the horse to get to the grocery store!

Despite the positive, open reaction to the use of technology for health care, participants also identified needs to assure successful implementation. The participants reported a preference for technology they already had in the home and were comfortable with its use. They also reported concern for others who may not have technology and how there would be a greater learning curve. Participants reported the need for a third person available to assist with technology education and problem solving. The largest reported factor for potential telehealth use was the importance of face-to-face interaction, especially if the person with dementia was involved in the session. The caregivers reported feeling they could "do OK" without face-to-face but the person with dementia would need to see the face of the health care provider to make that connection.

> Participant 0317: "If he's going to be involved in it, it would probably be better with a one-on-one."

Perception of occupational therapy. The final domain of the interview examined the participant's understanding and perception of occupational therapy for the person with dementia and the caregiver.

Limited knowledge. The participants all reported minimal knowledge and past experience with occupational therapy in general. One of the participants knew of occupational therapy through her work in a nursing home and another had seen occupational therapy when a sibling was in rehabilitation. None of the participants reported any knowledge of the role of occupational therapy with dementia care.

> Participant 0417: "They have rehab don't they? I know when my sister had her knee and her hip done once over at Good Samaritan, there were a lot of occupational therapists there.

Appreciate role of occupational therapy. Further discussion about the role of occupational therapy in general and more specific to dementia care began to widen the participant's understanding of occupational therapy. This led to an appreciation of the aspects of the dementia care that occupational therapy may be of assistance to caregivers and the person with dementia.

Gaining knowledge. The insight of gaining knowledge about the role of occupational therapy in dementia care was evident in the continued discussion and questions asked of the participants during the interview. The conversation turned from the moderator explaining the role of occupational therapy to the participants

offering different occupations of daily life. This demonstration of knowledge showed

an increasing awareness of occupational therapy.

> Participant 0517: "Or just getting ready is a major project. But, so it would be helping *me* to cope with what to do with him?"

Identifying needs from occupational therapy. As the conversation continued,

the participants went further to offer specific challenges for which occupational

therapy could provide intervention. These needs were challenges they discussed

earlier in the interview and new ones they offered as they further identified how

occupational therapy might assist in treating both the caregiver and the PWD.

> Participant 0216: "You could, you could, uh, how I say, um find out what he's capable of doing, ask the caregiver, you know "what is, what are their abilities? Is he walking or is she still walking?" You know, what they can do, to make follow directions, that isn't always easy."

In summary, the thematic findings identified out of the participant's

descriptions of their dementia journey, skills for technology use, and perceptions of

occupational therapy speak to the similarities and differences experienced by each

participant. The participants showed resiliency in their ability to adapt to the

changing needs of the PWD. They also described varying degrees of current

technology use for increasing their own education and learning new strategies to

assist with daily routines. They all described an openness to utilizing technology for

receipt of occupational therapy services. The participants were open to learning

new technology and how technology can assist them in their daily lives.

Discussion

The themes identified from the qualitative interviews highlight the unique

situation each person with dementia and caregiver experience in their own journey.

Though the progression of dementia can be categorized into stages and expected

symptoms by type of dementia, the challenges and adaptive strategies that work for

each dyad will vary based upon the needs and situations apparent to that dyad.

Assessing the unique qualities of each client for a tailored plan of care is one of the

core principles of occupational therapy practice (American Occupational Therapy

Association, 2014).

Use and perception of technology is also unique to each individual. A

person's comfort with the different formats and content for technology use will vary

based upon their past exposure. Overall, this study demonstrated through both

qualitative and quantitative findings that the participant's perception of technology

trends toward the positive. However, it does not negate the variance in each

participant's level of use and perception of technology. There was a demonstrated

difference with the data indicating low use and neutral or negative perception to the

daily use and positive perception. As noted by Demiris et al. (2010), a system that

utilizes the client feedback will create a more successful development and implementation of that system.

It is important to note that all participants were open to learning technology for use with telehealth. Participants expressed a willingness and ability to learn. A study conducted by Cimperman, Brenčič, Trkman, and Stanonik (2013) also found that older adults do not view their perceived self-efficacy for computer use as an inhibiting factor to adopting telehealth.

Limitations

This study has the strengths of a mixed-method design that provided a concurrent triangulation of the data for increase trustworthiness. However, there are limitations to the data that were collected. The participants are homogenous in characteristics of living in the same geographical location. This limits the generalizability of the data. There was also not enough data collected to reach saturation of themes. It is possible that there is additional data that can be collected to add to this current research that may change the understanding of the PWD and their caregivers' perceptions of telehealth.

Future Research

Future research should focus on the continued data collection to increase the trustworthiness of the results of this study. Continued participant interviews with

PWD and their caregivers in different geographical locations of the state of interest will increase the generalizability of the results. Data collection should continue until a saturation of themes has been reached. Saturation of themes allows for the clear understanding of consistent descriptions by participants (Krueger & Casey, 2015).

Conclusion

Both the person with dementia and the caregiver are an important part of the team when developing a plan to utilize telehealth services for occupational therapy. It is important to consider the dyad's experience, perception, and knowledge of technology and occupational therapy. Inclusion of the client into the process will increase the likelihood of successful implementation of occupational therapy services delivered by telehealth.

CHAPTER V

DEVELOPMENT OF A BEST PRACTICE MODEL FOR DELIVERY OF TELEOT

SERVICES FOR CLIENTS WITH DEMENTIA AND THEIR CAREGIVERS

Ethical practice is a cornerstone for all health care professions. The

Hippocratic Oath is arguably the most widely known of these oaths. It is a pledge

taken by physicians to uphold a standard of ethical practice accepted by the

profession (U.S. National Library of Medicine, 2012). Although occupational therapy

does not have a similar accepted oath taken by all practitioners upon entering the

profession, the American Occupational Therapy Association upholds that all

occupational therapy practitioners must abide by the same standards of practice.

The Standards of Practice for Occupational Therapy binds the practitioner to ethical

practice (American Occupational Therapy Association, 2015b)

Utilization of a best practice model is one step toward assuring occupational

therapy practitioners uphold ethical practice standards. The Occupational Therapy

Code of Ethics is a set of standards to which all occupational therapy practitioners

are to abide in order to uphold the core values of the profession. Two aspects of

ethical practice is the duty to uphold the principles of beneficence and

nonmaleficence (American Occupational Therapy Association, 2015a). A best

practice model is designed to provide a level of service that is in line with the best

available evidence and provides the most good. This can assist the practitioner to provide benefit and avoid harm. Furthermore, the American Occupational Therapy Association (2015b) outlines the standards of practice to include "services consistent with best practice approaches" (p. 3) and utilizing the "best available evidence" (p. 4). It is our professional obligation to utilize best practice models to deliver ethical and efficacious services.

Best practice must be followed for all areas of practice and service delivery methods. The American Occupational Therapy Association (AOTA) provides multiple avenues for identifying best practice models for various diagnoses and client populations. These include official documents, an online evidence exchange, and publications. The Occupational Therapy Practice Guidelines are published by AOTA and are based upon current systematic reviews. The guidelines provide practice guidelines in specific topic areas of adult and pediatric practice (American Occupational Therapy Association, n.d.).

The *Occupational Therapy Practice Guidelines for Adults with Alzheimer's Disease and Related Disorders* provides best practice for working with individuals with dementia and their caregivers during all stages of the disease (American Occupational Therapy Association, 2010a). However, it does not prescribe a specific method for delivery of services. The purpose of the third study was to develop a best practice model for delivery of occupational therapy services through telehealth for clients with dementia and their caregivers.

Methods

Procedures

The development of the best practice model utilized a three-step process to identify the best available evidence. The first step was a survey of all occupational, physical, and speech-language pathology therapists in one upper Midwest state. The survey aimed to identify the level of knowledge and perception of the use of telerehabilitation in practice. The second step was to identify the needs and perceptions of individuals with dementia and their caregivers. Participants of the second study completed a survey about their perceptions of computers and the Internet. After completing the survey, the participants took part in a group interview. This second study was conducted in the same state as the practitioner survey to parallel a similar health care environment and access to technology. The third step was to synthesize the data from the two studies with the current evidence available in the literature. Analysis of the data collected through the first two studies and current literature guided the development of the best practice model in the theoretical context of the Person Environment Occupation (PEO) model and Technology Acceptance Model (TAM).

Results

The best practice model (see Appendix E) includes the following information:

Chapter 1: Introduction

Chapter 2: Needs Assessment

Chapter 3: Technology Considerations

Chapter 4: Reimbursement

Chapter 5: Decision Guide

The first chapter introduces the method utilized to complete the best practice model and its purpose. The introduction also provides a brief explanation of the purpose of occupational therapy for individuals with dementia and their caregivers. The final part of the introduction introduces telehealth.

The second chapter provides a guide for how to complete a needs assessment to identify the needs of both the practitioner and the client in respect to technology. The needs assessment identifies how to conduct a proper assessment in the context of technology needs for the client, the caregiver, and the occupational therapy practitioner. The assessment is conducted in context of perception of the ease of use and usefulness of technology and the factors of the person, environment, and occupation. The person is the client or practitioner. The environment is the virtual environment. The occupation is the receipt or delivery of the occupational therapy services. This chapter also provides a means to identify the overall cost-effectiveness of a telehealth system. Cost effectiveness is an important aspect of a needs assessment because a system that does not provide a financially viable method to deliver services will not provide a viable method for long-term usability (Pramuka & van Roosmalen, 2009). The information provided in the cost effectiveness section does not provide a direct cost effectiveness calculation. This

section provides best current evidence about what to include when calculating cost effectiveness of a system.

The third chapter identifies various aspects of type and uses for technology to meet both the needs of the practitioner and client as well as the goal of the services provided. This chapter provides resources to seek out further information that is available in the specific location of services and in context of the services to be provided. It does not endorse or discriminate against any type of system or company. The purpose of this is to assist the practitioner in determining the best system to utilize based upon each clinical situation.

The fourth chapter provides considerations for reimbursement. This chapter provides the best current evidence of reimbursement models available to occupational therapy. The chapter covers current Medicare, Medicaid, private insurance, and private payment regulations and considerations. It is up to the practitioner to determine the reimbursement regulations that apply with each client payer source according to the area in which they live.

The fifth chapter is a quick decision guide meant as a means to expedite the decision process once the practitioner is familiar with the best practice model. The quick decision guide should not be the first source of reference, but meant as an ongoing guide to assist the practitioner as he/she becomes more familiar with the best practice approach in providing occupational therapy services to clients with dementia and their caregivers through the delivery model of telehealth.

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The best practice model was reviewed by two occupational therapists with at least three years of experience in the delivery of services to clients with dementia and their caregivers. The therapists were experts in the delivery of telehealth to older adults. Feedback provided by the reviewers was assessed for appropriate changes to improve the overall content and structure of the best practice model.

Discussion

The development of the best practice model utilized evidence collected from two studies and the use of current evidence. Incorporating the perceptions of the client and practitioner enhanced the holistic approach to the best practice model. Synthesizing this information with the current best evidence provides a model that guides the practitioner to service delivery that is ethical and follows standards of practice.

The best practice model guides the practitioner through five chapters: an introduction, needs assessment, technology considerations, reimbursement, and a decision guide. These five chapters are intended to provide the practitioner with the information necessary to initiate the best practice for delivery of occupational therapy services through telehealth to the person with dementia and his/her caregiver.

Limitations

The best practice model does have limitations to its use. Currently, the data gathered to synthesize the information for the client section is not complete. Further data gathering is needed to assure complete understanding of the perception of persons with dementia and their caregivers. The data for this section were also gathered from one geographical area so the data are limited in generalizability.

Another limitation speaks to the scope and temporal nature of the model. The model is intended for use within the home health context. It is not intended to be applied in other settings where occupational therapists may treat persons with dementia. With that, the model is based upon current evidence of telehealth and home health services. This evidence continues to develop and changes in best practice identified in the literature will continue to change. For example, the best available technology now may be different in five years.

Future Research

The limitations inherent in the best practice model guide the direction for future research. Future research should focus on the continued collection of data from persons with dementia and their caregivers. Research should continue on this aspect of the best practice model until a saturation of themes has been achieved with participants from different geographical locations. Further research should

focus on expanding the data collected to other parts of the United States. This expansion of data collection will increase the generalizability of the model.

Another area of future research is to expand the generalizability of the model to other practice areas. Occupational therapists treat persons with dementia and their caregivers in other settings such as hospitals and long-term care facilities. Expanding the model will expand the use of telehealth as a delivery model for other contexts where it may be a useful tool to reach this population.

Conclusion

The best practice model is a guide to the occupational therapy practitioner for delivery of services to the person with dementia and his/her caregiver using telehealth. The guide is intended as a model for delivery of services in the home health context. The use of this guide will provide the practitioner with an ethical means to follow standards of practice with evidence based information.

CHAPTER VI

SYNTHESIS AND DISCUSSION OF THREE STUDIES

The multiple benefits of telehealth services to both client and the

occupational therapy practitioner are becoming widely accepted as this new area of

delivery becomes established in the health care arena (Bendixen et al., 2007;

Sanford et al., 2007; Schein, Schmeler, Holm, et al., 2010). Occupational therapy

services can be provided through telehealth for clients who may not have access to

travel thereby preventing ready contact to experts in various areas of practice

(American Occupational Therapy Association, 2013b; World Federation of

Occupational Therapists, 2014). One area of telehealth that currently lacks support

for teleOT services is the population of clients with dementia and their caregivers.

Traditionally, occupational therapy for clients with dementia and their

caregivers has been supported in an in-person delivery model (Ciro et al., 2013;

Gitlin et al., 2005; Gitlin et al., 2003; Lam et al., 2010). Telehealth services to clients

with dementia have begun to be researched in other health care fields such as

general medicine and nursing (Buckley, 2006; Diamond, Glueckauf, et al., 2003; Loh

et al., 2004; Smith et al., 2007). The intent of this dissertation study was to bridge

the gap between the positive findings of telehealth in other health care areas for

intervention of persons with dementia and their caregivers to those valuable

services occupational therapy can provide to this client population. The three

questions that guided this dissertation work were:

> 1. What is the practitioner's perception of the utility of telerehabilitation for use in delivering occupational, physical, and speech therapy services to clients in one upper Midwestern state?

> 2. How do clients with dementia and their caregivers perceive the use of teleOT services?

> 3. What kind of best practice model can be created from the results of studies 1 and 2 that will enhance dementia care via teleOT services?

The guiding theoretical bases for this dissertation work were the Technology

Acceptance Model (TAM) (Davis, 1986) and the Person Environment Occupation

(PEO) model (Law et al., 1996). The first study was guided by the TAM theory

through use of a survey based upon validated questions to identify the practitioner

participants' perceptions of the ease of use and usefulness of telehealth. The second

study also utilized TAM to guide the interview questions and use of the Technology

Profile Inventory to identify perceptions of computers and the Internet. The

interview questions were also guided by PEO to identify aspects about the persons

with dementia and their caregivers' person factors, needs for occupational therapy

services, and current technology usage within the virtual context. The data collected

from both studies were utilized to develop the best practice model. The best

practice model was developed based upon the concepts of both models.

This dissertation closes the gap between telehealth and occupational therapy service for person with dementia and their caregivers through the development of a best practice model. This model provides the occupational therapy practitioner with the tools to identify and implement best practice specific to use of telehealth with persons with dementia and their caregivers.

The model first directs the practitioner in the completion of a needs assessment to identify technology needs of the client and the practitioner. The needs assessment focuses upon the person with dementia, caregiver, and occupational therapy practitioner. These individuals are major players in the telehealth system whose purpose is to provide occupational therapy services. There are five main constructs to be assessed in the needs assessment and they are based upon two theoretical models. The constructs of perceived ease of use and usefulness are derived from the Technology Acceptance Model. These constructs identify a user's perception of a technology system. A user's perception of a system's ease of use and usefulness directly influences one's attitude toward the system and thus the behavioral intention to use the system. The constructs of person, environment, and occupation are derived from the Person, Environment, and Occupation model. These three constructs correspond to three factors: the user, virtual environment, and occupational therapy services. These, in turn, will affect the identified needs of the telehealth system. As shown in Figure 1, the five constructs are centered around each of the users and each construct is along a continuum with the others. Each

construct does not stand alone as the only factor to assess the needs of the telehealth system. Rather, each construct must be assessed within the context of each of the users, the other constructs, and the other users' needs so as to describe a holistic picture of what is required for an effective telehealth system.
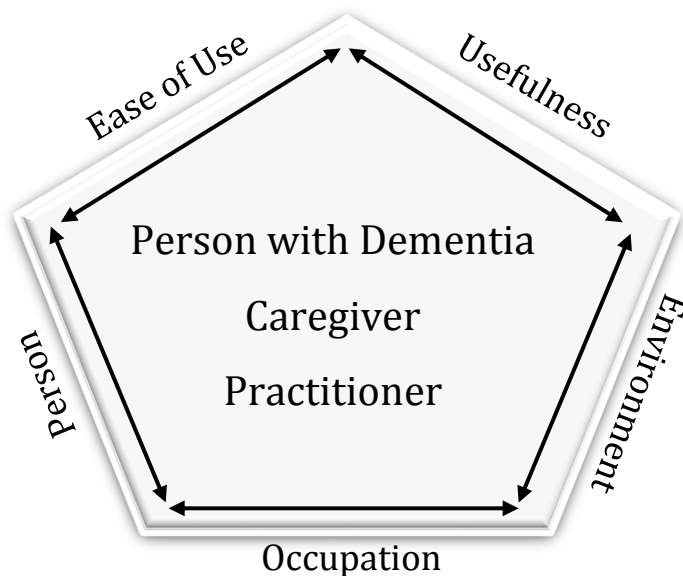
Ease of Use Usefulness

Person with Dementia
Caregiver
Practitioner

Person

Environment

Occupation

Figure 1. Theoretical underpinnings of the telehealth needs assessment.

The model then provides an overview of technology considerations, including how to locate technology vendors, how to select the right technology, and ethical considerations for implementation of technology in practice. The third aspect of the model provides an overview of different reimbursement models including Medicare, Medicaid, private insurance, and private payment. Finally, the model

provides the practitioner with a quick decision guide to assist in guiding the process

of identification of the key aspects for implementation of telehealth in a safe, ethical,

and practical manner.

The development of the best practice model is based upon the

implementation of two studies as part of this dissertation work and a thorough

review of current best evidence. The overall design of the first two parts of the

dissertation work was a mixed methods concurrent transformative design. This

design allowed for data collected from both studies to be analyzed independently.

The quantitative data collected from study one and the qualitative and quantitative

data from study two were analyzed separately and then compared to identify areas

of similarity and difference.

The transformative design of the mixed-method approach allowed for each

set of data to maintain full integrity in the development of the best practice model. A

mixed methods design provides an effective method to the collection of data from

multiple resources for complete understanding of each population's perceptions of

telehealth (Creswell & Plano Clark, 2011). Collection of quantitative data from

practitioners and both quantitative and qualitative data from persons with

dementia and their caregivers added benefit to the development of the best practice

model. Use of a survey for quantitative data collection of practitioner perceptions

was more feasible to collect a larger amount of data in a short amount of time. The

use of mixed-method data collection for persons with dementia and their caregivers

allowed for an opportunity to educate these participants on the use of occupational therapy and telehealth. The focus group design was more applicable for this population because of the nature of the topics discussed. The collection of quantitative data allowed the researcher to compare and contrast the qualitative findings to those perceptions provided in the pre-interview survey. Then, the data sets collected from practitioners, persons with dementia, and caregivers of persons with dementia were compared and contrasted to understand the needs of each major player of the telehealth system.

The first study was a survey to identify occupational therapy, physical therapy, and speech-language pathology practitioners' perceptions of telehealth for use in their current practice. The second study was a mixed-method design to describe persons with dementia and their caregivers' experiences and perceptions of the use of telehealth to receive occupational therapy services.

The results from the first study determined that most therapy practitioners in the state of interest currently do not use telehealth. The second major finding was that the level of knowledge of telehealth was minimal. Despite these findings, the overall trend of the mean perception of the ease of use and usefulness of telehealth was toward the positive. However, the standard deviation of the results did put the mean range from the negative to the positive, indicating a mix of perceptions from these practitioner participants.

Similarly, the second study with the persons with dementia and their caregivers had those same results. The results of the Technology Profile Inventory indicated that the participants' perceptions of technology and the internet trended toward the positive; however, the scores trended toward neutral on the low end of the range. Perceptions of confidence and approval also ranged from the neutral to the more positive. Perceptions of participants' level of interest in computers and the Internet ranged from the more negative to the more positive. The qualitative results supported these findings through identification of participant's limited knowledge of telehealth but open to the uses of technology for receipt of occupational therapy or other health care services.

Overall, knowledge of telehealth by both practitioners and clients is limited in the state of interest per both studies. However, participants of each study indicated an open perception to the utility of technology for the delivery and receipt of health care services. This is a positive sign as the technology acceptance model posits that the perception of the ease of use and usefulness of technology directly affects one's attitude toward the technology and thus, affects one's behavioral intention to use the technology (Davis, 1986). Studies by Carlisle and Warren (2013), Levy and Strachan (2013), and Segar et al. (2013) support this concept that practitioners and clients are open to the use of telehealth but may have some hesitation of its full utility in direct health care delivery.

The results of the two studies informed the development of the best practice model. The best practice model incorporates the need to identify the client's and the practitioner's perception of the ease of use and usefulness of telehealth as well as the current type and uses for technology in everyday life. Identifying this information about both parties involved in the occupational therapy services allows the practitioner to identify any inherent biases toward technology and the current level of working knowledge about technology. If a client or practitioner has limited knowledge of technology in general, it will be an important step to educate the client or oneself on the use of technology in health care. It is also important to identify a system that will match the needs of the users for their level of knowledge and ability.

The use of telehealth with a person with dementia and his/her caregiver requires a client-centered needs assessment as identified in the best practice model. The needs assessment allows the practitioners to match the technology to the needs of the client and the needs of the occupational therapy services. This may be different for each client, but may take a similar form. Study two results identified a consistent theme among the person with dementia and caregiver participants of preferring a face-to-face format of telehealth delivery model. Participants described the need for the face-to-face format for the person with dementia to make the connection with the practitioner who was speaking and for clarity of interpretation of the intended intervention approach.

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In the end, the best practice model was developed around the needs of the client and the practitioner as a means to provide a guide for the practitioner to implement occupational therapy services through telehealth to persons with dementia and their caregivers in a safe, ethical, and practical manner. The development of the best practice model utilized the results of the perceptions of both practitioners and clients with the current best evidence. This three-prong approach to the development of the model increases the holistic approach to providing services consistent with the standards of practice for occupational therapy.

Implications

The research conducted in this dissertation and the development of the best practice model has multiple implications to practice. First, it reaffirms the need for a holistic, client-centered approach to occupational therapy service delivery. Implementation of the telehealth system must center around the needs of the client and the practitioner. The second implication is the need to identify the needs based upon access to services and technology. The environment of the telehealth context goes beyond that of just the physical location of the client's home. A full understanding of the implications of a client's physical access to services needs to be taken into account.

Identification of access to services is a two-pronged approach. First, the practitioner must assess the client's perception about receiving services through

means of telehealth versus traditional in-person services. Depending upon the location of the client in proximity to the practitioner's clinical location, the use of telehealth services may hold a greater need. For example, if a client lives in a location that does not provide convenient access to an occupational therapy practitioner, telehealth may be a preferred method to eliminate the time and cost of travel. Second, the practitioner must assess the access to technology. Of the different types of technology that may be needed for the telehealth system, internet access may pose the greatest barrier for clients and practitioners. According to the Federal Communications Commission (FCC, n.d.), the recommended minimum download speed for HD video conferencing and telelearning is four megabits per second (Mbps). Reports from the FCC indicate that broadband service is available in most parts of the country; however, these reports are based upon broadband providers in an area (FCC, 2016). This does not indicate actual access to each household in that area. Access to internet service sufficient to provide the desired telehealth applications may be a major challenge to the delivery of services and requires careful consideration of the participant's resources.

A final implication for this research is the extension of the best practice model beyond the clinic and into the classroom. The best practice model can be utilized as a guide to educating future occupational therapy practitioners on the best practice of using telehealth as a service delivery method to client with dementia and their caregivers. The education on the use of telehealth is mandated in the

educational standards (ACOTE, 2012). The best practice model can be one resource used to achieve this standard.

Limitations

There are limitations to the generalizability of this dissertation. The participants for the studies about perceptions from practitioners and persons with dementia and their caregivers were all from one state. This allowed for increased comparability between the two groups because both groups lived and worked in a state with the same access to health care and technology; however, it does not allow for generalizability to other geographical areas where the health care and technology environment may be different. In addition, other locations may also have different cultural views that influence the perception of telehealth.

A second limitation is the limited number of participants in the second study. Saturation of themes was not reached in this study. All participants came from the same geographical location of the state of interest. The intent of the study was to identify perceptions of persons with dementia and their caregivers from across the entire state of interest. This aim was not achieved so the data gathered are from participants who are from one geographical location that has a higher population than other parts of the state. Persons with dementia and their caregivers living in rural areas of the state may have different perceptions not represented in this study.

Future Research

Future research in this area should focus on the identified limitations of the study for increased generalizability and confidence in the study results. Future research needs include expanding recruitment and data collection from persons with dementia and their caregivers and obtaining perceptions of telehealth from this client population. Such data will assist in enlarging and reinforcing the current data collected. The focus of this continued research also needs to be on gathering data from persons with dementia and their caregivers across the current state of interest to expand beyond one geographical area of the state. Saturation of themes and an increased cross section of participants would further ensure confidence in the second study results.

Further research could be done to increase the generalizability of the results of the best practice model to relate to other geographical areas by incorporating perceptions of practitioners and persons with dementia and their caregivers from other parts of the United States. It is strongly believed that the current two studies could be replicated in other areas of the country to confirm or add to the results of this current dissertation work. Future data collection in other geographical areas will allow for additional confidence in the generalizability of the best practice model to serve occupational therapy practitioners in all regions of the country.

A final area of future research is to generalize the best practice model to incorporate other practice settings. The current best practice model is specific to

occupational therapy services provided in a home health environment. A best

practice model can be developed through future research that provides the best

practice for delivery of occupational therapy services through telehealth for persons

with dementia and their caregivers in a clinic environment, hospital, and long-term

care facility.

Summary

This dissertation work was completed through three phases. The first phase

identified occupational therapy, physical therapy, and speech-language pathology

practitioners' perceptions and knowledge about the use of telehealth in their

current practice. The second phase identified persons with dementia's and their

caregiver's perceptions and current use of technology. The third phase utilized the

evidence from the first two phases and current best evidence to develop a best

practice model for the delivery of occupational therapy services to persons with

dementia and their caregivers. This dissertation work bridges the gap between the

current evidence, which supports the use of telehealth in health care, with that of

the limited evidence of the effectiveness of telehealth as a delivery model for

occupational therapy services to clients with dementia. It is a first step in the

development of future research to build evidence on the utility of telehealth for a

specific population of clients who have dementia and their caregivers.

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Appendix A

Practitioner Perception of Telerehabilitation Questionnaire

Telerehabilitation: "encompasses a range of rehabilitation and habilitation services that include assessment, monitoring, prevention, intervention, supervision, education, consultation, and counseling. Telerehabilitation services are delivered to adults and children by a broad range of professionals…" (American Telemedicine Association Telerehabilitation Special Interest Group, 2010)

Demographic Information

Professional Title/Credentials: _____

Years of experience: _____

Primary area of practice (i.e. pediatrics, geriatrics, etc.): _____

County in South Dakota where services are primarily delivered: _____

Gender: _____   Age: _____

1. I feel knowledgeable about the use of Telerehabilitation in my profession.		Yes	Somewhat	No
2. I currently use telerehabilitation in my practice (see definition above).		Yes (continue to question 3)	No (continue to question 4)	
3. I use telerehabilitation (on average) with…	Less than 25% of my clients	25 – 49% of my clients	50 – 75% of my clients	76 – 100% of my clients

For each of the following statements, mark the category (strongly agree to strongly disagree) that most closely relates to your perception about the use of Telerehabilitation in your practice.					
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
4. Use of Telerehabilitation can/does improve the quality of work I do.					
5. Use of Telerehabilitation can/does give me greater control over my work.					

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More statements on back

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
6. Telerehabilitation could/does enable me to accomplish tasks more quickly.					
7. Telerehabilitation could/does support critical aspects of my job.					
8. Use of Telerehabilitation could/does increase my productivity.					
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
9. Use of Telerehabilitation could/does allow me to accomplish more work than would otherwise be possible.					
10. Use of Telerehabilitation could/does enhance my effectiveness on the job.					
11. Overall, I find Telerehabilitation could be/is useful in my job.					
12. I feel Telerehabilitation technology would be/is cumbersome to use.					
13. Learning to operate Telerehabilitation technology would be/is easy for me.					
14. Interacting with Telerehabilitation technology would be/is frustrating.					
15. I feel it would be/is easy to get Telerehabilitation technology to do what I want it to do.					
16. I feel Telerehabilitation technology would be/is rigid and inflexible to interact with.					

17. It would be/is easy for me to remember how to perform tasks using the Telerehabilitation technology.					
18. Interacting with Telerehabilitation technology would/does require a lot of mental effort.					
19. I feel interacting with Telerehabilitation technology would be/is clear and understandable.					
20. I feel it would/does take a lot of effort to become skillful at using Telerehabilitation technology.					
21. Overall, I feel Telerehabilitation technology would be/is easy to use.					

Thank you for your participation in our research study. Please return the completed survey in the postage-paid envelope.

Appendix B

Demographic Information Survey

Code name:

Do you have a diagnoses of dementia? Yes _____   No _____

Are you a caregiver for a person with dementia? Yes _____ No _____

Average hours of caregiver assistance needed/provided per day: _____

County of residence: _____

Gender: _____   Age: _____

Appendix C

Technology Profile Inventory

Technology Profile Inventory (TPI)

The statements below are about attitudes towards computers and the Internet. Using the scale as a a guide, circle the number that best indicates the extent to which you agree or disagree with each statement. *Be as honest and accurate as possible.*

	Strongly Disagree	Neutral	Strongly Agree

1. I do not have trouble learning how to do things with computers.

   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

2. I would be interested in finding entertainment on the Internet.

   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

3. I would enjoy reading magazines or books about computers.

   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

4. Computers make me nervous, anxious, or tense.

   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

5. I think almost everyone could benefit from using the Internet.

   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

6. I like to use new software.

   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

7. I find dealing with computers to be stressful.

   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

8. I frequently use the Internet to look up things that interest me.

   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

9. I would like to see more shows about computers on TV.

   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

10. I have a lot of confidence in my ability to accomplish things with computers and the Internet.

    1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

11. I don't like to use computers.

    1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

12. Learning about computers and the Internet is boring.

    1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

13. I find the Internet confusing and disorienting.

    1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

14. Computers can be a great source of entertainment.

    1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

15. Learning about computers can be fun even when it isn't useful.

    1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

Technology Profile Inventory (TPI)

The statements below are about attitudes towards computers and the Internet. Using the scale as a a guide, circle the number that best indicates the extent to which you agree or disagree with each statement. *Be as honest and accurate as possible.*

	Strongly Disagree	Neutral	Strongly Agree
16. I rarely find computers frustrating.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
17. I do not consider owning a computer to be a necessity.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
18. I would be interested to learn about new technology for computers or the Internet.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
19. I wish using computers wasn't so difficult.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
20. Working with computers and the Internet can be enjoyable and stimulating.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
21. I don't care to know about how computers and the Internet work.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
22. I often feel overwhelmed by the complexity of computers.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
23. I do not find surfing the Internet relaxing and pleasurable.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
24. I don't want to know more about computers than I have to.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
25. I often feel I need help when using computers.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
26. I don't like to use the Internet.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
27. I like to think up new ways of doing things with computers.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
28. I feel at ease using computers and the Internet.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
29. Computers are useful educational tools.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
30. I'm not interested when people discuss computers.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		

Appendix D

Semi-structured Interview Format for Focus Groups

The purpose of this interview is to understand your experience with dementia your perception about the use of technology to assist you in everyday activities.

Perception of living with dementia:

1. Tell me about your experience living with dementia or caring for someone with dementia.

2. What does dementia mean to you?

How did you feel when you realized you or your loved one had dementia?

What are some of the challenges you face?

Perception of technology:

3. What is your experience with technology?
   a. Have you utilized technology to find information or resources related to dementia and/or caregiving?
   b. What type of resources did you find?
   c. Were the resources helpful? How?

Perception of TeleOT:

4. Are you familiar with occupational therapy services for dementia care?
   a. What is your experience with occupational therapy for dementia care?

5. What is your perception of the benefits and limitations of using technology to connect to an occupational therapist?
   a. What requirements do you foresee being most useful to have a positive experience using technology?

Wrap-up:

6. Is there anything else you would like to add at this time?

Appendix E

Best Practice Model

BEST PRACTICE MODEL:

DELIVERY OF OCCUPATIONAL THERAPY SERVICES

THROUGH TELEHEALTH

FOR CLIENTS WITH DEMENTIA AND THEIR CAREGIVERS

Ranelle M. Nissen, May 2017

Table of Contents

Chapter 1

Introduction

The purpose of this guide is to provide the occupational therapy practitioner with a best practice model that determines whether or not and in what context delivery of occupational therapy services for a client with dementia and his/her caregiver are appropriate in a telehealth model. The context of delivery is a home health model of care. This model is not intended as a guide to provide services by telehealth to clients in an institutional environment such as a hospital or skilled care facility. Further, this guide is an adjunct to assist occupational therapy practitioners identify areas of important consideration before use of telehealth as a delivery model. It was developed through a review of survey results and focus group interview sessions with key stakeholders and a thorough review of current evidence-based literature. Surveys were sent to all occupational, physical, and speech therapy practitioners in one upper Midwest state. Focus group sessions were conducted with individuals with dementia and their caregivers in the same state. Results of both studies were reconciled with the current evidence-based literature.

In addition to this best practice model, the occupational therapy practitioner should utilize his/her best clinical judgement to identify how this model fits within each unique context to assure ethical and efficacious delivery of services. This model is

not intended to be a guide to occupational therapy assessment and treatment of clients with dementia.

Dementia Care

Occupational therapy intervention for clients with dementia and their caregivers is supported through evidence-based literature. See Appendix C for a listing of studies and documents supporting the use of occupational therapy services to affect the needs of individuals with dementia and their caregivers. One main source of support for the use of occupational therapy services is the *Occupational Therapy Practice Guidelines for Adults with Alzheimer's Disease and Related Disorders* which provides evidence-based documentation of the efficacy of occupational therapy services for this population (American Occupational Therapy Association, 2010a). The guidelines identify best practice for occupational therapy evaluation and intervention based upon the Occupational Therapy Practice Framework: Domain and Process (2nd ed.) (American Occupational Therapy Association, 2008). These guidelines provide a recommended list of evaluation approaches and specific assessments to utilize. Intervention is described as being best approached through a focus on caregiver education, environmental adaptations, and compensatory strategies (American Occupational Therapy Association, 2010a).

Telehealth

Telehealth is a means to deliver occupational therapy services through use of technology. The World Federation of Occupational Therapy and the American Occupational Therapy Association support the use of telehealth as a means of service delivery (American Occupational Therapy Association, 2013b; World Federation of Occupational Therapists, 2014). Telehealth is a larger encompassing term that includes delivery of health care services through means of information and communication technologies. Telerehabilitation is the specific use of telehealth for means of delivering rehabilitation services such as occupational therapy services.

It is imperative to identify the best means of delivering occupational therapy services through use of telehealth. The World Federation of Occupational Therapists (2014) and American Occupational Therapy Association (2013b) recognize and emphasize the importance of the use of telehealth as a delivery model by following the same standards utilized when delivering services through the traditional in-person model. Both organizations also recognize the need to identify means of evaluations and interventions that are supported by evidence as effective in the virtual environment. When best practice standards are followed, telehealth can be utilized for evaluation, intervention, prevention, in-home monitoring, supervision,

and consultation services (American Occupational Therapy Association, 2013b; World Federation of Occupational Therapists, 2014)

It is the professional and ethical obligation of the occupational therapy practitioner to identify the most effective approach to evaluation and intervention when providing services to clients with dementia. This may vary by practice setting so it is recommended for the practitioner to first identify the appropriate evaluation and intervention needs of each client prior to determining if telehealth is an appropriate delivery method. Effective service delivery should be the top priority.

Chapter 2

Needs Assessment

A needs assessment is a means to identify the needs of all stakeholders. For purposes of this best practice model, the main stakeholders will be identified as the client, caregiver, and occupational therapy practitioner. Each situation may be different and additional stakeholders may be identified. Extension of the needs assessment should include all stakeholders identified by the practitioner to assure an effective delivery of services through telehealth. Neglecting to identify and assess the needs of all stakeholders may result in failure of the telehealth delivery model. The purpose of the needs assessment is to identify the technological needs of each stakeholder. This includes identifying attitudes towards technology systems for telehealth use and the best fit between the person and technology for the receipt or delivery of occupational therapy services.

Each aspect of the needs assessment will identify the person's current access to, attitude toward, and knowledge of information and communication technology systems. Identification of these three areas will assist in identifying the current need to be filled prior to implementing the occupational therapy services through telehealth. The theoretical basis of these concepts will follow the Person Environment Occupation model (Law et al., 1996) and the Technology Acceptance Model (Davis, 1986). The needs assessment will follow a basic structure of these

two underlying theoretical models. The needs assessment for each stakeholder

should assess all of the following:

- Perceived ease of use of the information and technology system

- Perceived usefulness of the information and technology system

- Person factors affecting interaction within the virtual environment

- Virtual environment requirements

- Requirements of the occupational therapy services

Perceived ease of use identifies the user's (client, caregiver, occupational therapy

practitioner) perception of how easy or difficult the technology system is to use.

Perceived usefulness identifies the user's perception of how useful the system is for

its intended use. It is important to identify these perceptions because, as the

Technology Acceptance Model posits, a person's perception of a technology system's

ease of use and usefulness will influence actual use of the system (Davis, 1986;

Holden & Karsh, 2010). If the person does not perceive the technology system with a

positive attitude, the implementation of the use of telehealth for delivery of

occupational therapy services may fail.

The next three areas to assess are the person, environment, and occupation. These

areas are important to identify in context of each user's needs. The client is going to

have different strengths and weaknesses that may affect his/her ability to interact in

the virtual environment than the therapist will experience (Law et al., 1996). The

chosen system must allow the greatest occupational performance for all users of the system. Maximizing occupational performance of all users will increase the likelihood of successful implementation of the telehealth delivery model.

The following sections provide the occupational therapy practitioner with methods to assess each of the five identified areas in a method that is specific to each user. The practitioner should use best clinical judgment to identify the appropriate assessment measures based upon each user's situation. Factors identified as inconsistent with the intended use of the telehealth system must be evaluated to determine if there is no change needed, a change needed, or terminate the services through telehealth for an alternative method.

Client

For purposes of this best practice model, the client will refer to the person with dementia, the caregiver or the dyad. It is recognized by the author that the client, in broader respects, does include the caregiver to form the client dyad. The client may also directly refer to the caregiver alone.

The client needs assessment may vary widely based upon the client's current level of functioning. The practitioner may find that it is only appropriate to assess the client person factors, as the client may not be at a cognitive level to provide a meaningful response about his/her perception toward a technology system's ease of

use and usefulness. If this is the case, the caregiver should be assessed as the main user of the technology system.

Perceived ease of use & usefulness:

Perceived ease of use and usefulness are factors that can be assessed together. It should be a continual assessment to assure the technology chosen for delivery of services is meeting the changing needs of the client. Depending on the level of cognitive function of the client, the assessment can include, but is not limited to, an interview, formal assessments, or observation of behavior toward the technology. Davis (1986) developed and tested a set of questions to measure a person's perceived ease of use and usefulness of a technology system. It is important to assess this component because, as the TAM model posits, a person's perception of the system will be directly related to his/her attitude and, in turn, directly affect the behavioral intention to use the system. These assessments can be completed to identify a person's perception toward telehealth technology, in general, or toward a specific system that may already be chosen for use. See Table 1 for three assessments available to assess a person's perceived ease of use and usefulness of a technology system.

Table 1: Perceived Ease of Use & Usefulness Assessments
(See Appendix A for view only copies of all assessments)
Technology Acceptance Model Questionnaire The questions comprise a list of 20 questions that are answered based upon a 7-point Likert scale from 1 (strongly agree) to 7 (strongly disagree). Ten questions relate to perceived usefulness and ten of the questions relate to perceived ease of use. After reversing negatively worded items, the scores of each set of questions are averaged for an overall perception of ease of use and usefulness. The questions and scale represented in the appendix provide the original questions and scale developed by Davis (1986). More recent literature has adapted the question list and scale in different forms. See Lin (2013) and Chau and Hu (2002) for examples of modified forms of the questionnaire.
Technology Profile Inventory (TPI) The TPI is a measure of a person's perceived confidence, approval and interest toward computers and the internet created by Spence et al. (2009). It is a 30-item questionnaire based upon a 5-point Likert scale of 1 (strongly disagree) to 5 (strongly agree). There are 10 items each to measure confidence, approval, and interest. After the negatively worded items are reversed, scoring is completing by averaging the 10 items for each factor. The total score for general attitude toward computers and the internet is obtained by averring the three factor scores.
Telehealth Usability Questionnaire The TUQ is a 21 item questionnaire created by Parmanto, Pulantara, Schutte, Saptono, and McCue (2013). The questionnaire measures experience with a system so must be used after at least one use with a system. The scoring is based on a 7-point Likert type scale from 1 (disagree) to 7 (agree). The total score can be averaged for a general score of the user's experience.

Person Factors

The person factors are assessed for the purpose of identifying the needs for the

telehealth system and are separate from the assessment completed to identify the

occupational therapy goals. The intent is to assure the client does not have difficulty

accessing and interacting with the telehealth system. The occupational therapy

practitioner is uniquely qualified to assess these components of the client (American

Occupational Therapy Association, 2014). Table 2 provides a list of potential person

factors that may affect the client's ability to interact with a system. The practitioner

should assess for potential dysfunction that may influence the type and extent of

technology used. The practitioner should use clinical judgement to determine what

factors and assessments are most appropriate to utilize.

Table 2: Person Factors
Specific mental functions*
Global mental functions*
Sensory functions*
Neuromusculoskeletal and movement-related functions*
Muscle functions*
Movement functions*
Voice and speech functions*
Level of knowledge of technology
Perception of technology

*Factor taken directly from the *Occupational Therapy Practice Framework: Domain
& Process: 3rd Edition* (American Occupational Therapy Association, 2014)

Virtual Environment Requirements

It is important to assess the virtual environment prior to and during the receipt of

occupational therapy services. In the best-case scenario, the virtual environment for

context of receiving the services will not affect the overall outcomes of the services.

Identifying the key aspects of the environment, listed in Table 3, will establish what

technology is already in place for use, what updates are needed, and what new items

may need to be added. It will also assure compliance with HIPAA. The information

gathered at this point must be compared to the information gathered on the

practitioner's site to assure compatibility for fluid transmission of data between the

two sites.

Table 3: Environment Factors
Client owned technology   Identify the type and current working condition of the technology owned by the client. Gather specifications of the operating system, applications, video & audio capabilities, and any other aspects of the equipment that are of importance to receipt of services through telehealth. The needed information will vary based upon the type and extent of services that will be provided.
Internet access   Identify the type and bandwidth of the internet service provider available in the location of services.
Privacy & security   Work with telehealth companies that can provide a platform to provide the services in the manner in which the practitioner intends but still provide for the protections afforded to the client by law. The platform must be able to securely transmit and store all client information in compliance with the Health Insurance Portability and Accountability Act (HIPAA). The client should also be afforded the same privacy afforded to a client being seen in-person. The virtual environment should not be viewable by anyone other than who the client has already agreed to be present either physically or virtually.
Physical location of technology equipment   Assure adequate space available for the equipment and for the client to be positioned at a comfortable distance within the space.

Requirements of the Occupational Therapy Services

The type and extent of services to be provided will affect the technology needed to best deliver the occupational therapy services. The practitioner must consider what sessions will be delivered by telehealth to determine if there are assessments or specific interventions that are compatible with the chosen technology system. The best clinical practice should follow the occupational therapy standards of practice. The chosen services should be based upon best clinical judgement for what is best for the client, and then identify the technology to fit the needs of the services. It is best ethical practice to provide services that are of the same or better quality as services that would be provided in-person. Table 4 provides a list of potential occupation factors to consider.

Table 4: Occupation Factors
Planned assessments
Planned interventions
Goals • Short-term • Long-term
Physical space needed for session
Additional people in the room • Client support • Technical support

Occupational Therapy Practitioner

Perceived ease of use & usefulness

Perceived ease of use and usefulness are factors that can be assessed together. It should be a continual assessment to assure the technology chosen for delivery of services is meeting the client needs identified by the occupational therapy practitioner. The assessment for the practitioner will be done by the practitioner himself or herself, as a check to assure that their own perception of the chosen system is appropriate. The practitioner perceptions of the system are just as important to successful implementation as the client and caregiver perceptions (Holland et al., 2014; Segar et al., 2013). Davis (1986) developed and tested a set of questions to measure a person's perceived ease of use and usefulness of a technology system. It is important to assess this component because, as the TAM model posits, a person's perception of the system will be directly related to his/her attitude and, in turn, directly affect the behavioral intention to use the system. These assessments can be completed to identify a person's perception toward telehealth technology in general or toward a specific system that may already be chosen for use. See Table 1 for three assessments available to assess a person's perceived ease of use and usefulness of a technology system.

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(See Appendix A for view only copies of all assessments)
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Technology Profile Inventory The TPI is a measure of a person's perceived confidence, approval and interest toward computers and the internet created by Spence et al. (2009). It is a 30-item questionnaire based upon a 5-point Likert scale of 1 (strongly disagree) to 5 (strongly agree). There are 10 items each to measure confidence, approval, and interest. After the negatively worded items are reversed, scoring is completing by averaging the 10 items for each factor. The total score for general attitude toward computers and the internet is obtained by averring the three factor scores.
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Person Factors

The person factors for the occupational therapy practitioner will affect the ability to

interact and control the technology system. It is important for the practitioner to

self-identify if there are modifications that need to be taken on his/her part to

assure successful implementation of the services through telehealth.

Table 2: Person Factors
Sensory functions*
Neuromusculoskeletal and movement-related functions*
Muscle functions*
Movement functions*
Voice and speech functions*

*All factors are taken directly from the *Occupational Therapy Practice Framework: Domain & Process: 3rd Edition* (American Occupational Therapy Association, 2014)

Virtual Environment Requirements

The occupational therapy practitioner will be interacting in the same virtual world

as the client. It is the practitioner's legal and ethical obligation to assure the same

environmental factors are evaluated for the telehealth session.

Table 3: Environment Factors
Technology available   Identify the type and current working condition of the technology available. Gather specifications of the operating system, applications, video & audio capabilities, and any other aspects of the equipment that are of importance to delivery of services through telehealth. The needed information will vary based upon the type and extent of services that will be provided.
Internet access   Identify the type and bandwidth of the internet service provider available in the location of the practitioner.
Privacy & security   Work with telehealth companies that can provide a platform to provide the services in the manner in which the practitioner intends but still provide for the protections afforded to the client by law. The platform must be able to securely transmit and store all client information in compliance with the Health Insurance Portability and Accountability Act (HIPAA). The client

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should also be afforded the same privacy afforded to a client being seen in-person. The virtual environment should not be viewable by anyone other than who the client has already agreed to be present either physically or virtually.
Physical location of technology equipment   Assure adequate space available for the equipment and for the practitioner to be positioned at a comfortable distance within the space.

Requirements of the Occupational Therapy Services

The type and extent of services to be provided will affect the technology needed to best deliver the occupational therapy services. The practitioner must consider what sessions will be delivered by telehealth to determine if there are assessments or specific interventions that are compatible with the chosen technology system. The best clinical practice should follow the occupational therapy standards of practice. The chosen services should be based upon best clinical judgement for what is best for the client and then identify the technology to fit the needs of the services. It is best ethical practice to provide services that are of the same or better quality as services that would be provided in-person. Table 4 provides a list of potential occupation factors to consider.

Table 4: Occupation Factors
Planned assessments
Planned interventions

Goals
   • Short-term
   • Long-term

Physical space needed for session
Additional people in the room

• Expert practitioners
• Technical support

Cost Effectiveness

The cost of services is a key factor to consider prior to implementing telehealth occupational therapy services. The exact cost of services can be estimated prior to implementation of services and done as a cost-effectiveness study as the services are implemented for a more accurate measure. A return on investment (ROI) calculation can be completed for each stakeholder. The ROI is a calculation of the ratio of gain relative to the investment. The gain and investment is going to be different for each stakeholder (LeadingAge Center for Aging Services Technologies, 2015).

At an organizational level, the practitioner may need to identify key members of the organization to assist in determining true input and output costs to assess cost effectiveness. It is more time efficient to assess cost effectiveness for delivery of occupational therapy services to clients with dementia and their caregivers as a general overview than to assess cost effectiveness with each individual client. As an organization, identifying a formula to determine cost effectiveness based upon multiple factors will make the process efficient. This formula can be set to a minimum level of reimbursement to cost ratio that is acceptable to the organization (LeadingAge Center for Aging Services Technologies, 2015).

The organization is only one aspect of cost effectiveness. Calculating cost

effectiveness also extends to the client and the payer source. All stakeholders should

be considered when assessing whether or not telehealth is an appropriate method

of treatment delivery model for occupational therapy services. The same process

can be done for all stakeholders to determine ROI, but done separately and

accurately to account for the true gain and investment of each stakeholder

(LeadingAge Center for Aging Services Technologies, 2015).

Each situation will be different so there is not an established rule of what is or is not

cost effective. Costs and gains will vary with each organization, client, payer source,

and any other stakeholder. It is recommended that the practitioner take the

information presented in this best practice model and speak with a financial

consultant to further determine the true ROI of telehealth occupational therapy

services. Table 1 provides factors to consider for a return on investment analysis.

Table 1: Potential Factors to Consider for Return on Investment Analysis
• Cost of new equipment
• Upgrades needed to equipment
• Installation costs
• Cost of internet service
• Maintenance of equipment
• IT services – practitioner and client locations
• Telehealth platform
• Travel – practitioner and/or client
• Admission to hospital or long-term care facility
• Travel – practitioner and/or client
o May be reduced or eliminated
• Admission to hospital or long-term care facility

- o   May be reduced or prolonged
- Reimbursement for services
- Co-pay or payment for services

Chapter 3

Technology Considerations

Technology

Multiple vendors exist to provide telehealth technology systems. Vendors can

provide stand alone products to purchase or provide complete telehealth platform

systems. The practitioner can work with a vendor to identify the right technology

needs to fit the desired services. The following list of organizations can provide

information and resources on how to identify and locate a vendor or other

resources for telehealth.

American Telemedicine Association - www.americantelemed.org

Telehealth Resource Centers - www.telehealthresourcecenter.org

Center for Telehealth and eHealth Law – www.ctel.org

Office for the Advancement of Telehealth (ORHP/HRSA) -

www.hrsa.gov/ruralhealth/telehealth

Office of the National Coordinator for Health Information Technology (ONC) -

www.healthit.gov/

Selection of Technology

The type of information technology system chosen for delivery of occupational therapy services through telehealth must match the identified needs of the services to be provided and the users of the system. See Chapter 2: Needs Assessment for information of how to determine these needs. There is a vast array of technology that can be utilized for use in telehealth. This ranges from the simple electronic tablet to a complex system designed for specific biometric data recording.

The first step is to determine the functions of the technology needed to perform the identified needs for the service. This may include functions such as audio and video capabilities or ability to be mobile to move around the client's home. It will also include functions of user accessibility. If the client has arthritis and is unable to grip a mouse to interact with the system, then consider a touch screen with a built-up stylus.

The second step is to identify the cost effectiveness of the equipment. Determine if the equipment desired is cost feasible for whichever party is purchasing the equipment. If the client must purchase the equipment but does not have the financial means, consider alternative methods of obtaining the equipment or a lease option that the client or health care company can afford. This second step is a

process of reconciling the desired technology needs with the feasibility of obtaining that equipment. Alternative equipment or payment sources can be identified at this step that are still good options.

The third step will be to obtain the technology. The technology should be tested for proper installation and user accessibility. Initial client education on new equipment and telehealth interfaces occurs at this stage. The practitioner will work with the client to determine how much and to whom will provide the installation and education.

These three steps are intended as a guide to determine the type of technology that fits the needs of the occupational therapy services and users, are cost effective, and function properly. These three steps are important steps to follow when initially selecting technology but should also be continually assessed throughout the course of the services. Continual assessment of these three steps will ensure the technology chosen initially are keeping up with the changing context of services and are in proper working order. Failure to match the technology to the needs of the services and users, are cost effective, and continually function properly can lead to a failure of the occupational therapy services.

Ethical Considerations

There are many ethical considerations to consider with the selection and implementation of technology for use to deliver occupational therapy services. Three major areas of ethical consideration are the client, the practice standards, and regulations.

First, the practitioner has an ethical obligation to the client to provide beneficial services that allow for client autonomy. The ethical obligation is the same for practice being delivered in-person or by telehealth. The practitioner has an obligation to consider factors such as the complexity of the client's condition, intervention approach, and technology used to determine if telehealth is an appropriate delivery method. The client has the right to be notified of the differences between in-person and telehealth delivery methods to make an informed choice.

A second area of ethical consideration is the practice of occupational therapy. The practitioner has the ethical obligation to uphold the same standards of practice in the telehealth environment as what would be provided in-person. These include obligations of continual reevaluation of the services provided to assure standards are being upheld and an ethical obligation to ensure beneficial service to the client is achieved. The practitioner should also maintain continued competence in delivery of services through telehealth by evaluating current evidence. Continuing education

is available through approved providers. The following list provides a sample of

resources available to access information and continuing education about

telehealth.

Organizations:

American Occupational Therapy Association:

      Position Paper: *Telehealth*

      Special Interest Section: *Technology*

      OT Connections Forum: *Telehealth*

American Telemedicine Association

Center for Telehealth and eHealth Law – www.ctel.org

Office for the Advancement of Telehealth (ORHP/HRSA) - www.hrsa.gov/ruralhealth/telehealth

Office of the National Coordinator for Health Information Technology (ONC) - www.healthit.gov/

Telehealth Resource Centers - www.telehealthresourcecenter.org

World Federation of Occupational Therapists:

      Position Statement: *Telehealth*

Journals:

International Journal of Telemedicine and Applications

International Journal of Telerehabilitation

Journal of Telemedicine and Telecare

Smart Homecare Technology and Telehealth

Telemedicine and e-Health

The third area of ethical obligation is to uphold justice through adherence to

applicable laws and regulations. As the telehealth service environment rapidly

changes, so does the current state laws regarding the use of telehealth in practice. Health care reimbursement regulations also change with the advancement of knowledge of telehealth. The practitioner is obligated to stay up to date with new laws and regulations.

In summary, the occupational therapy practitioner is ethically obligated to provide a level of service that upholds to the standards of practice and ethical guidelines of the profession (American Occupational Therapy Association, 2010b, 2015a). These same standards are to be upheld in any environment of practice, including the virtual environment. The practitioner must continue to review and implement the best available evidence to maintain these standards.

Chapter 4

Reimbursement

All data reported is current as of February 2017. Seek further financial advice regarding current reimbursement guidelines as appropriate.

Medicare

The Center for Medicare and Medicaid Services (CMS) has issued payment guidelines for reimbursement of telehealth services. The guidelines require the Medicare beneficiary be at an approved location within a Metropolitan Statistical Area (MSA) or a rural Health Professional Shortage Area (HPSA). This is termed the originating site. The originating site must also be one of the following physical locations: office of a physician or practitioner, hospital, critical access hospital, rural health clinic, federally qualified health center, hospital-based or critical access hospital-based renal dialysis center, skilled nursing facility, or community mental health center (Centers for Medicare and Medicaid Services, November 2016).

According to the Centers for Medicare and Medicaid Services (November 2016) calendar year 2017 policy, the distant site practitioner must utilize an "interactive audio and video telecommunications system that permits real-time communication" (p. 2). The group of approved distant site practitioners include physicians, nurse practitioners, physician assistants, nurse-midwives, clinical nurse specialists,

certified registered nurse anesthetists, clinical psychologists, clinical social workers, and registered dietitians or nutrition professionals (Centers for Medicare and Medicaid Services, November 2016).

Occupational therapy practitioners are not an approved distant site practitioner. An Advanced Beneficiary Notice (ABN) must be issued to the beneficiary if the occupational therapy practitioner wants to bill for services through telehealth to a Medicare beneficiary. The ABN provides the client notice that you reasonably expect that Medicare will not cover the occupational therapy services provided. If the client agrees to the services after receiving the ABN, the client is financially liable (Centers for Medicare and Medicaid Services, October 2015)

Medicaid

Medicaid reimbursement coverage varies by state. The Centers for Medicare and Medicaid Services (CMS) recognizes telehealth as a cost-effective means to provide services. CMS requires that all practitioners conform to each State Practice Act when providing services across state lines. All services and the technology used "must satisfy federal requirements of efficiency, economy and quality of care" (Centers for Medicare and Medicaid Services, n.d.). CMS does not require states to reimburse for telehealth services. It is at the state level to set rules regarding type and extent of services provided (Centers for Medicare and Medicaid Services, n.d.). It is not in the scope of this best practice model to outline the reimbursement policy for

occupational therapy services delivered through telehealth for each state. The practitioner should identify the state Medicaid regulations where the client resides.

Private Insurance

Each private insurance company has a variety of plans to cover health care services. Each company and each plan will vary on the types and extent of coverage for reimbursement. It is recommended the client and practitioner identify if occupational therapy services through telehealth is a covered service prior to engaging in an agreement for services.

Private Pay

Private pay may be a reasonable option for payment of services. The practitioner must assure the client agrees to pay out of pocket services at a determined rate for service. There may also be other requirements that need to be fulfilled prior to holding the client financially responsible (see Medicare section above).

In summary, it is important to understand the payer sources of the services prior to implementing an evaluation or intervention to the person with dementia and his/her caregiver. Dependent upon the type of payer source, telehealth may not be a covered service delivery model and the client will be financially liable. The ethical principle of fidelity directs practitioners to provide full disclosure of information to clients to make a sound decision about their participation in occupational therapy services.

Chapter 5

Decision Guide

The decision guide is intended to provide the occupational therapy practitioner with a methodological guide that assesses readiness and ethical considerations for providing services through a telehealth delivery model. The guide answers the question: Is telehealth an appropriate delivery method for the client with dementia and his/her caregiver? The guide was developed by the student researcher based upon the results of two studies conducted as part of a larger body of dissertation work and a thorough review of current best evidence.

Decision Guide

1. Is the occupational therapy practitioner competent in the telehealth delivery method?	
If yes: proceed to the next question	If no: Do not proceed with delivery of services until competency has been achieved.
2. Does the client, or the client's power of attorney, consent to services delivered through telehealth?	
If yes: proceed to the next question	If no: An alternative method must be utilized for delivery of the occupational therapy services.
3. Does the client, or the client's power of attorney, agree to the established method of payment for services?	
If yes: proceed to the next question	If no: An alternative arrangement for payment or services must be negotiated.
4. Will the selected evaluation and intervention services be delivered at the same standard of care as it would be if delivered in-person?	

If yes: proceed to the next question	If no: Modify the plan as needed to provide in-person sessions for evaluation and intervention services that are more appropriate for that method of delivery.
5. Is the selected technology appropriate for the person, the practitioner, and the delivery of the services as intended?	
If yes: proceed to the next question	If no: Identify the appropriate technology to meet the needs of the client, the practitioner, and the services to be provided.
6. Does the technology and environment provide for security and privacy of all protected client information and services provided?	
If yes: Continue to examine questions 1 – 6 to assure continued compliance.	If no: Implement a system that is HIPAA compliant and provide an environment that protects the privacy of the client.

Case example: Implementing the best practice model

The occupational therapist (OT), Sarah, receives an order to evaluate and treat a person with dementia due to declining performance after an illness. The client does not qualify for home health services, but the caregiver, the client's power of attorney and spouse, is concerned about the challenge with transportation to and from the outpatient clinic. Sarah has identified telehealth as an alternative option to the delivery of services to this client dyad.

{Needs Assessment – Practitioner} The clinic where Sarah works has a fully established telehealth process. The necessary information technology systems are in place to conduct a telehealth session. Sarah has taken continuing education classes

and received mentoring in the use of telehealth. She feels fully capable to conduct the telehealth session.

The next step is for Sarah to identify the client needs for receipt of the OT services through telehealth. {*Reimbursement*} The client receives health care benefits under Medicare and the process of notification of expected non-payment of services has been completed. The caregiver and the facility have agreed upon a private pay fee schedule. The caregiver has consented to receive the services through telehealth as an alternative option to the challenges of transporting her spouse the long distance to the clinic.

{*Needs Assessment – Client*} However, the client dyad lives in a rural area and self-report that they are not proficient users of technology. First, Sarah has the caregiver complete an assessment to determine her level of perception about computers and the internet. This assessment provides Sarah with an understanding of how much education the caregiver may need prior to using the telehealth system. The person with dementia is of advanced stages in the disease process so is not appropriate to complete these assessments. The assessment results indicate the caregiver has a positive perception about her ability to learn how to use technology but may need additional education with the initial setup. Sarah learns that the caregiver does use a computer and has internet access with a broadband download speed of five Mbps. This is sufficient for video conferencing connections and other Internet needs that

Sarah may choose to implement during the OT sessions. The caregiver reports that the computer is setup in a room with no other furniture. It is identified that this space is adequate for the OT session activities. The computer does not have a video camera, but does have speakers.

{Technology Considerations} Sarah determines it will be best to conduct sessions through videoconference so recommends the client purchase a video camera for the computer. The client agrees to purchase the equipment and has a son who will install the camera. The son will provide technical assistance during the first couple of treatment sessions until the caregiver feels comfortable managing the system on her own. Sarah would also like to complete a home assessment as part of the evaluation, but the caregiver does not have a portable means of videoconferencing equipment and does not have the means to purchase this equipment. Sarah determines a visit to the home for the initial evaluation will be in the best interest of the client.

{Needs Assessment – Client} The final assessment is to determine the client and caregiver's needs for modifications of the equipment. The caregiver reports good health and will be the primary user of the technology. The caregiver reports the person with dementia has hearing loss and feels he may have difficulty hearing Sarah during the sessions. Sarah recommends the caregiver provide headphones for

the person with dementia to increase his participation in each session. The
headphones can be used as tolerated.

Sarah does a final assessment to assure all factors have been considered prior to
starting the course of therapy sessions. Sarah has assessed for the perceptions of all
users about the use of technology and has taken into consideration the needs of each
user, the technology available for use, and the needs for optimal delivery of the
occupational therapy services. Sarah will continue to re-assess these needs as the
occupational therapy process progresses.

Overview of Case Example

Order Received	Initiate process to determine if telehealth is a viable delivery option
Needs Assessment - Practitioner	Practioner has positive perception and all needs for person, environment, and occupation are met
Reimbursement	Medicare policies are followed to establish a private payment agreement
Needs Assessment - Client	Caregiver will be primary technology user
	Assessments given to caregiver to assess perception of technology
	Identify virtual environment needs at the client's home
Technology Considerations	Recommendations for technology needs made to fit needs of OT sessions
Needs Assessment - Client	Assess client for person factors that may impact interaction with technology

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APPENDICES

Appendix A: Assessments

Technology Acceptance Model Questionnaire

Technology Profile Inventory

Telehealth Usability Questionnaire

Technology Acceptance Model Questionnaire

Fill in the blanks with the name of the technology to be assessed.

Perceived Ease of Use	Strongly Agree			Neutral			Strongly Disagree
1. I find _____ cumbersome to use.	1	2	3	4	5	6	7
2. Learning to operate _____ is easy for me.	1	2	3	4	5	6	7
3. Interacting with _____ is often frustrating.	1	2	3	4	5	6	7
4. I find it easy to get _____ to do what I want it to do.	1	2	3	4	5	6	7
5. The _____ is rigid and inflexible to interact with.	1	2	3	4	5	6	7
6. It is easy for me to remember how to perform tasks using the _____.	1	2	3	4	5	6	7
7. Interacting with the _____ requires a lot of mental effort.	1	2	3	4	5	6	7
8. My interaction with the _____ is clear and understandable.	1	2	3	4	5	6	7
9. I find it takes a lot of effort to become skillful at using _____.	1	2	3	4	5	6	7
10. Overall, I find the _____ easy to use.	1	2	3	4	5	6	7
Perceived Usefulness							
1. Using _____ improves the quality of the work I do.	1	2	3	4	5	6	7
2. Using _____ gives me greater control over my work.	1	2	3	4	5	6	7
3. _____ enables me to accomplish tasks more quickly.	1	2	3	4	5	6	7
4. _____ supports critical aspects of my job.	1	2	3	4	5	6	7
5. Using _____ increases my productivity.	1	2	3	4	5	6	7
6. Using _____ improves my job performance.	1	2	3	4	5	6	7

7. Using _____ allows me to accomplish more work than would otherwise be possible.	1	2	3	4	5	6	7
8. Using _____ enhances my effectiveness on the job.	1	2	3	4	5	6	7
9. Using _____ makes it easier to do my job.	1	2	3	4	5	6	7
10. Overall, I find _____ useful in my job.	1	2	3	4	5	6	7

Questions developed by Fred D. Davis Jr. (1986)

Technology Profile Inventory

Technology Profile Inventory (TPI)

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The statements below are about attitudes towards computers and the Internet. Using the scale as a a guide, circle the number that best indicates the extent to which you agree or disagree with each statement. *Be as honest and accurate as possible.*

	Strongly Disagree	**Neutral**	**Strongly Agree**

1. I do not have trouble learning how to do things with computers.   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

2. I would be interested in finding entertainment on the Internet.   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

3. I would enjoy reading magazines or books about computers.   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

4. Computers make me nervous, anxious, or tense.   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

5. I think almost everyone could benefit from using the Internet.   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

6. I like to use new software.   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

7. I find dealing with computers to be stressful.   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

8. I frequently use the Internet to look up things that interest me.   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

9. I would like to see more shows about computers on TV.   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

10. I have a lot of confidence in my ability to accomplish things with computers and the Internet.   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

11. I don't like to use computers.   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

12. Learning about computers and the Internet is boring.   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

13. I find the Internet confusing and disorienting.   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

14. Computers can be a great source of entertainment.   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

15. Learning about computers can be fun even when it isn't useful.   1 - - - - 2 - - - - 3 - - - - 4 - - - - 5

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Technology Profile Inventory (TPI)

Copyright © 2004-2009 Ian Spence and Colin DeYoung

The statements below are about attitudes towards computers and the Internet. Using the scale as a a guide, circle the number that best indicates the extent to which you agree or disagree with each statement. *Be as honest and accurate as possible.*

	Strongly Disagree	Neutral	Strongly Agree
16. I rarely find computers frustrating.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
17. I do not consider owning a computer to be a necessity.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
18. I would be interested to learn about new technology for computers or the Internet.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
19. I wish using computers wasn't so difficult.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
20. Working with computers and the Internet can be enjoyable and stimulating.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
21. I don't care to know about how computers and the Internet work.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
22. I often feel overwhelmed by the complexity of computers.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
23. I do not find surfing the Internet relaxing and pleasurable.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
24. I don't want to know more about computers than I have to.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
25. I often feel I need help when using computers.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
26. I don't like to use the Internet.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
27. I like to think up new ways of doing things with computers.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
28. I feel at ease using computers and the Internet.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
29. Computers are useful educational tools.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		
30. I'm not interested when people discuss computers.	1 - - - - 2 - - - - 3 - - - - 4 - - - - 5		

Telehealth Usability Questionnaire

Figure 2: Telehealth Usability Questionnaire
(Parmanto et al., 2013)

University of Pittsburgh
School of Health and Rehabilitation Sciences

6026 Forbes Tower
Pittsburgh, Pennsylvania 15260
412-383-6649
Fax: 412-383-6655
SHRS: http://www.shrs.pitt.edu

Telehealth Usability Questionnaire (TUQ)
February, 2012

		N/A		1	2	3	4	5	6	7	
1.	Telehealth improves my access to healthcare services.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
2.	Telehealth saves me time traveling to a hospital or specialist clinic.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
3.	Telehealth provides for my healthcare need.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
4.	It was simple to use this system.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
5.	It was easy to learn to use the system.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
6.	I believe I could become productive quickly using this system	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
7.	The way I interact with this system is pleasant.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
8.	I like using the system.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
9.	The system is simple and easy to understand.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
10.	This system is able to do everything I would want it to be able to do.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
11.	I can easily talk to the clinician using the telehealth system.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
12.	I can hear the clinician clearly using the telehealth system.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
13.	I felt I was able to express myself effectively.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
14.	Using the telehealth system, I can see the clinician as well as if we met in person.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
15.	I think the visits provided over the telehealth system are the same as in-person visits.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
16.	Whenever I made a mistake using the system, I could recover easily and quickly.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
17.	The system gave error messages that clearly told me how to fix problems.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE

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Figure 2. (continued)

18.	I feel comfortable communicating with the clininician using the telehealth system.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
19.	Telehealth is an acceptable way to receive healthcare services.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
20.	I would use telehealth services again.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE
21.	Overall, I am satisfied with this telehealth system.	☐	DISAGREE	☐	☐	☐	☐	☐	☐	☐	AGREE

Please provide comments about the telehealth system:

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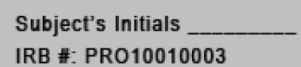
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