12-2013

Technology Use in Rural Appalachia: A Pilot Study of the Implications for Pediatric Behavioral Health

Courtney E. Lilly
East Tennessee State University

Technology Use in Rural Appalachia: A Pilot Study of the Implications for Pediatric
Behavioral Health

_____

A thesis

presented to

the faculty of the Department of Psychology

East Tennessee State University

In partial fulfillment

of the requirements for the degree

Master of Arts in Psychology
with a Concentration in Clinical Psychology

_____

by

Courtney Lilly

December 2013

_____

Dr. Jodi Polaha, Chair

Dr. Stacey Williams

Dr. Steve Marshall

Keywords: behavioral health, telehealth, videoconferencing, rural, technology, Appalachia

ABSTRACT

Technology Use in Rural Appalachia: A Pilot Study of the Implications for Pediatric
Behavioral Health

by

Courtney Lilly

Technology is a promising means for increasing rural individuals' access to behavioral healthcare.

However, the range of technology use in rural areas is currently unknown. The aims of this study

were to examine the use of technology in rural areas, the relationship between technology use and

willingness to access pediatric mental health services via videoconferencing, and this relationship

within the context of other critical variables linked to service uptake. Data were collected at 2

pediatric primary care clinics. While no significant relationship was found between technology use

and willingness to use videoconferencing, a significant relationship emerged between previous service

seeking and willingness to use videoconferencing. These findings indicate the need for more research

examining other variables' relationships to willingness to seek help via technology, such as general

help-seeking attitudes, unfamiliarity with videoconferencing services, or other variables included in

previously established models of technology adoption.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Rural individuals face unique barriers to accessing and receiving behavioral healthcare. Behavioral healthcare professionals are sparse in rural areas resulting in few options and long waiting lists for services. Traveling to a metropolitan area engages logistical barriers such as time and costs associated with travel and missed work. In addition, there is some evidence that rural residents report high levels of stigma around mental healthcare services.

To address these barriers the field of behavioral healthcare must work "outside of the box," discovering new ways to increase client access to care. Technological advances present innovative opportunities for overcoming barriers to care. The literature documents interventions for an array of physical and mental health concerns using cellular phones, internet, and videoconferencing technology. For effective dissemination of technological interventions to occur, familiar and frequently used technologies should be identified to increase community uptake. However, the extent of technology use in rural areas is currently unknown, making this task difficult. Two-way videoconferencing may have particular advantages in rural areas. This technology can bring mental health services into shortage areas without the time and costs associated with travel.

This study is an examination of pilot data collected in the context of a larger study. Data were collected at two pediatric primary care clinics in rural Appalachia. Adults accompanying a child to his or her visit completed a self-report packet while in the waiting room. The specific purposes of this study were to examine the use of various technologies in rural areas, the relationship between technology use and willingness to access mental health services for children via two-way videoconferencing, and the relationship between technology use and willingness to access services via videoconferencing in the context of other critical variables linked to service uptake including stigma, previous service seeking, severity of concerns, caregiver strain, and logistical barriers to care. Results

will offer insight into technology use in rural Appalachia as well as factors impacting willingness to receive behavioral healthcare through technology, all important considerations in increasing the reach of treatments to these areas.

This chapter provides an overview of pertinent literature. First, research identifying barriers to mental health care for rural residents is reviewed. Second, applications and efficacy of technological mental health interventions are examined. Third, rural access to technology and other variables linked to mental health service uptake are discussed. Finally, the study purposes and hypotheses are identified.

Rural Access to Behavioral Healthcare

Individuals residing in rural areas experience unique barriers to accessing mental healthcare. A lack of healthcare providers, logistical concerns, and associated stigma are cited as primary obstacles. The following sections review these barriers as rural individuals experience them.

Shortage of Providers. According to one study, 87% of designated mental health shortage areas are considered nonmetropolitan areas (Bird, Dempsey, & Hartley, 2001). Another study found that the most rural regions within the United States are 4.7 times more likely to have the designation of mental health professional shortage area than the most urban regions (Merwin, Hinton, Dembling, & Stern, 2003). This study also reports that 51% of counties in the nation are considered mental health professional shortage areas; however, this rate is 53%-76% for counties with a RUCC score between 5 and 9 (with RUCC scores of 9 having the highest percentage). Rural-Urban Continuum Codes (RUCC) refer to a nine-point system for classifying counties into metropolitan and nonmetropolitan areas with higher numbers referring to more rural counties (United States Department of Agriculture, 2012).

This shortage is reflected in many rural regions. In Appalachia Hendryx (2008) found that 69.8% of nonmetropolitan counties were considered to be mental health professional shortage areas

while only 57.7% of non-Appalachian, nonrural counties within the same states met this criterion. According to a Washington-based study, urban regions had more psychiatric and nonpsychiatric providers than rural areas by 1.5 times and 3 times, respectively (Baldwin et al., 2006). Another study reported that Colorado experiences a large shortage of school psychologists. However, most of these unfilled positions lie within rural regions (Lahman, D'amato, Stecker, & Mcgrain, 2006). One participant in this study recited the account a school psychologist who had wanted to retire for 2 years but did not due to difficulties finding a replacement.

The impact of these shortages translates to poorer service access for rural individuals. Hauenstein et al. (2007) report that persons living in urban areas are 47% more likely to receive mental health treatment and 72% more likely to receive specialized treatment than individuals in the most rural areas. Additionally, individuals residing in the most rural areas obtain less psychological specialty treatment than those in urban areas (Hauenstein et al., 2006). One study of Australian children reports that school services are more heavily relied upon for psychological care by rural families, as opposed to urban families' reliance upon specialized services (Lyneham & Rapee, 2007). It is postulated that this shortage of providers leads to longer waiting times for obtaining an appointment (Noblin, Cortelyou-Ward, & Cantiello, 2012).

Logistics. Given the shortage of providers in rural communities, rural residents often travel to access care. In doing this, however, they encounter logistical difficulties such as time and cost associated with travel. One study showed that distance was the most frequently cited barrier by patients, staff, and healthcare providers for rural veterans in accessing healthcare (Buzza et al., 2011). In another study rural families with children exhibiting serious emotional problems encountered numerous barriers in accessing care including transportation, poverty, and availability of service (Pullman, VanHooser, Hoffman, & Heflinger, 2010).

Logistical concerns often have implications beyond time and cost associated with travel. Specifically, such barriers have been linked to service use patterns. The lack of insurance and poverty found in rural areas has been identified as a barrier to psychological care (Heflinger & Christens, 2006). A recent study in rural Appalachia produced similar findings, identifying costs and lack of insurance as two of the top five parent-reported reasons for not getting child behavioral healthcare (Polaha & Williams, manuscript in preparation). Additionally, a study located in western North Carolina found that rural individuals with a driver's license had higher number of health care visits than those without a license (Arcury, Preisser, Gesler, & Powers, 2005). This same study found that individuals with access to transportation through family or friends were found to have higher numbers of health care visits than those without this access.

Stigma. Stigma has also been identified as a significant barrier to behavioral healthcare (Pullman et al., 2010). Stigma can be "conceptualized as the process of objectification and dehumanization of other individuals" (Masuda, Price, Anderson, Schmertz, and Calamaras, 2009, p. 1244). This stigma is commonly related to a person's group memberships, such as identifying with a particular race, religion, gender, or sexual orientation. Stigma can also be experienced by those in need of psychological or behavioral healthcare services. Mental illness stigma is defined as "the process of objectifying and dehumanizing a person who is categorized as mentally ill" (Masuda et al., 2009, p. 1244). Stigma is not to be confused with discrimination, stereotyping, or prejudice. In fact, stigma is composed of these constructs but is operationally different from each one (Larson & Corrigan, 2010). Stereotyping involves the recognition of specific characteristics being attributed to an individual based on his or her belongingness to a particular group. Prejudice not only involves a recognition of negative stereotypes but a personal belief and agreement with them (Larson & Corrigan, 2010). This often leads to negative emotional reactions to individuals based on group membership

(Larson & Corrigan, 2010). Finally, discrimination is present when these negative emotional responses are manifested behaviorally (Larson & Corrigan, 2010).

While an in-depth discussion of stigma is beyond the scope of this paper, there are some fundamental principles of this concept that are important to consider. Stigma can manifest internally or externally (Larson & Corrigan, 2010). Public stigma can be conceptualized as overtly differential treatment of an individual because of his or her minority status. This treatment typically takes the form of prejudice, discrimination, and negative stereotyping (Larson & Corrigan, 2010). Over time public stigma can become internalized, leading individuals to believe the negative views applied to them based on group membership; this is called self-stigma. Self-stigma can translate to decreased self-confidence and self-efficacy, feeling unvalued by society, or behavioral avoidance (Larson & Corrigan, 2010).

How does stigma relate to mental health treatment use? Corrigan and Matthews (2003) posit that some individuals suppress psychological concerns and avoid treatment because of the anticipated consequences of public stigma. Other researchers suggest that help seeking can be threatening to a person's self-esteem in that asking for help may cause an individual to feel unequipped to handle the problem (Fisher, Nadler, & Whitcher-Alagna, 1982). Specifically, an individual may view help seeking as "a sign of weakness or an acknowledgement of failure" (Vogel, Wade, & Haake, 2006, p. 325). Larson and Corrigan (2010) suggest that rural individuals may experience more public stigma related to mental illness due to the decreased privacy associated with rural locations. Specifically, others may be more likely to discover that a person is seeking psychotherapy in a rural town. Also, the sense of community connection in rural towns could facilitate fast spread of a person's mental illness or associated treatment around the community (Larson & Corrigan, 2010). Due to the interconnectedness and lack of privacy in smaller, rural towns, stigma associated with mental health treatment warrants special attention.

Indeed, there is some evidence that rural residents experience stigma around mental health and treatment differently than urban individuals. One study looking at differences in depression-related stigma found that rural residents reported higher levels of stigma than urban counterparts (Jones, Cook, & Wang, 2011). Gsell (2010) found that young rural residents holding stigmatized ideas about individuals with mental illness were less likely to endorse help-seeking from a professional. Stigma has also been reported as a barrier to care among African American families in rural Georgia seeking help for their children with mental health problems (Murry, Heflinger, Suiter, & Brody, 2011), rural college students in the Midwestern United States (Calloway, 2008), and parents of children with several emotional disturbances (Pullman et al., 2010). A study in rural Australia found that 72% of participants reported feeling that others would gossip about a person with a mental disorder (Komiti, Judd, & Jackson, 2006). Additionally, 88% of participants in this study claimed feeling "uneasy" about obtaining help from a psychiatrist because of what others would think. Themes of self-reliance in the face of mental illness, feeling that sensitive issues should not be discussed outside the family unit, and admiration for those who can cope with mental illness without professional help were strongly endorsed within this same study (79%-88%). One recent study in rural Appalachia found that despite parents' overall low ratings of perceived stigma, 35% of parents reported fear of child labeling at school as a barrier to seeking behavioral services (Polaha & Williams, manuscript in preparation). Overall, this fear of labeling was ranked second among assessed barriers to care. A study by Hoyt, Conger, Valde, and Weihs (1997) also found that Iowa residents reporting stigma towards mental health were reported less willingness to seek mental health treatment in the future.

Technology

Technology is a promising means for overcoming rural barriers to care. Specifically, technology allows individuals to access care from the home, workplace, or other convenient locations. The use of technology for behavioral healthcare is a burgeoning area with many applications.

Landline phones, cell phones, smart phones, computers, and videoconferencing technology present opportunities for extending "reach" with behavioral interventions. The benefits of these technologies and an overview of their various applications to mental health and behavioral interventions are reviewed below.

Telephone-Based Interventions. Interventions offering care through telephones were among the first available technological interventions, dating back to at least 1973 (Schroeder, 1996). Phone-based interventions allow providers to contact clients in their everyday environments, allowing clients to work on an identified concern in the setting a concern is occurring (such as home or work). Telephone-call interventions also allow for private interaction, conducive to the formation of a relationship between client and provider (Burleson & Kaminer, 2007). Gumpert and Fish (1990) reported that telephone contact with a counselor was preferred by patients in some scenarios because it overcomes transportation and scheduling barriers.

As an example, Carolyn Schroeder and her colleagues demonstrated the utility of a behavioral call-in service based in pediatric primary care clinics. Initially, the behavioral needs of parents in a North Carolina pediatric clinic were surveyed. Parents were also asked about desired services for addressing these concerns. The call-in service was one result of this survey. Two hours per week were set aside for parents to call in and discuss concerns related to child behavior, development, or emotion (Schroeder, 1996). As a more recent example, Polaha, Volkmer, and Valleley (2007) also developed a call-in service to be used by parents in rural pediatric clinics to address behavioral and emotional concerns. This service was designed to supplement provider recommendations and behavioral health services occurring in primary care. A wide variety of concerns were addressed including enuresis, child behavior concerns, child anxiety, and sleep concerns.

These phone-based programs were accepted by participants and were effective in symptom reduction. More than 80% of parents using the call-in service based in North Carolina reported

significant improvement or remission of the problem (Schroeder, 1996). Additionally, 95% of service users reported satisfaction with the call-in service (Schroeder, 1996). Parents also reported high satisfaction with the more recent call-in service (Polaha et al., 2007). Many parents reported using strategies provided by the clinician after the phone call, and improvements were noted (Polaha et al., 2007).

Cell Phone-Based Interventions. In recent years, the presence of a landline telephone has slowly diminished. According to Blumberg and Luke (2012), 34.0% of Americans have *only* a wireless phone and 1.9% have no phone. The Pew Internet and American Life Project (2013) reports that 87% of adults within the United States both own and use a cellular mobile device as of December 2012. Specifically, the average cell phone owner makes or receives 12 phone calls daily (Pew Research Center, 2011a). Cellular phone interventions offer the same benefits of phone-based interventions but with portability, allowing client-provider communication in more diverse and real-world settings where patients may encounter concerns.

Cell phones also allow users to send written messages via text messaging, offering an additional convenience (Agyapong, Farren, & McLoughlin, 2011). Text messaging allows written messages that contain 160 characters or less to be delivered instantly to another's cellular phone (Fjeldsoe, Marshall, & Miller, 2009). While phone calls require a behavioral health provider and client to be concurrently available, text messaging allows each individual to respond at his or her convenience (Fjeldsoe et al., 2009). Text messaging also allows for communication in a variety of situations, "at any time, place, or setting" (Fjeldsoe et al., 2009). For example, a client might be unable to speak to a provider on the phone while at work but may be able to send or receive a text message because it requires less time. The Pew Research Center (2011a) reports that 73% of adult cell phone owners use the text messaging option available on their phone, with the mean number of daily text messages sent or received being 41.5. While the Pew Research Center (2011a) found that the

majority of cell phone users prefer contact via phone call, those reporting high levels of text messaging use preferred contact via text messaging. Recent data show cell phones present an opportunity for reaching specific populations who are high users of this technology. Cell phone use often begins during the early stages of adolescence (Blair & Fletcher, 2011). The Pew Research Center (2011a) reports that 95% of cell phone owners between the ages of 18 and 29 use text messaging, with the average of number of daily texts being more than double that of the general population. Adolescents in one study report that health counseling via text messaging (as well as e-mail or internet) would encourage uptake (Coker et al., 2010). As another example, Fjeldsoe et al. (2009) report that high levels of cell phone use are present in groups of lower social position and poorer health; therefore, cell phones could be a good tool for reaching these populations as well. According to the Pew Research Center (2010), a significantly higher percentage of Hispanic (87%) and black (87%) individuals own cell phones compared to white persons (80%). Additionally, a significantly higher proportion of black and Hispanic individuals report using a cell phone for text messaging, social media, and accessing the internet (Pew Research Center, 2010). While the mean number of texts sent and received per day was 31 for white individuals, means for black and Hispanic individuals were 70 and 48 respectively (Pew Research Center, 2011a).

Cell phones have been used to intervene in a variety of health and behavioral conditions. One literature review found that, of 24 studies using text messaging health interventions, 7 addressed adherence to medications, 8 addressed management of diagnosed illnesses, and 9 addressed some type of behavior modification (Wei, Hollin, & Kachnowski, 2011). Another review conducted by Agyapong et al. (2011) found text messaging interventions that remind individuals to apply sunscreen and take medications, reduce or manage medication side effects, and manage various addictions. Cell phone based interventions have also been used for reporting usage and craving of crack-cocaine among a homeless population (Freedman, Lester, McNamara, Milby, & Schumacher, 2006), providing

smoking cessation treatment to individuals diagnosed with HIV/AIDS (Vidrine, Arduino, & Gritz, 2006), disseminating planned activities training to families demonstrating risk factors for child maltreatment (Bigelow, Carta, & Lefever, 2008), and aiming to reduce subsequent pregnancies for pregnant or recently pregnant adolescents (Katz et al., 2011). Text messaging interventions have also provided insulin therapy (Franklin, Waller, Pagliari, & Greene, 2006) and aimed to increase physical activity (Newton, 2009) in children with diabetes.

A meta-analysis by Whittaker et al. (2009) found that overall cell phone-based interventions successfully aided smokers in short-term cessation. Chi and Stringer (2010) used text messaging to successfully increase adherence to HIV treatment regimens. A cell phone based intervention was also successfully applied to juvenile offenders (Burraston, Cherrington, & Bahr, 2010). Results showed that teens in a cognitive behavioral class plus cell phone behavior monitoring had the lowest recidivism rate as compared to the class only group and the control group. Another text messaging intervention was found to improve medication adherence, increase social interaction, and reduce severity of auditory hallucinations in individuals with schizophrenia or schizoaffective disorder (Granholm, Ben-Zeev, Link, Bradshaw, & Holden, 2012). Mobile interventions have also proven successful in participant retention. One study found the dropout rate of in-person treatment to be almost double that of a cell phone supplemented condition (Bigelow et al., 2008). Another study found the completion rate for pediatric healthy behavior monitoring was 72% when operating through text messaging. However, when paper diaries were used for self-monitoring, the completion rate was only 39% (Shapiro et al., 2008).

Internet-Based Interventions. Internet-based interventions can be used to provide individuals with online modules for health education, symptom management, or assessments. The U.S. Department of Commerce (2011) reports that within the United States, approximately 80% of homes have at least one internet user and approximately 71% of households have household internet access.

The Pew Internet & American Life Project (2013) reports that, in the previous year, 72% of adult internet users have looked for health-related information online. Additionally, because clients can rely on websites or modules to provide information, internet-based interventions can also reduce demand on the behavioral health provider. Once a program has been initially developed, a provider's work is likely minimal but his or her "reach" remains strong.

Web-based interventions have been applied to a wide range of behaviors and presenting concerns. Some of these include intervening on risky sexual behavior among HIV-positive youth (Markham, Shegog, Leonard, Bui, & Paul, 2009) and providing cognitive-behavioral therapy to adolescents with chronic pain and their parents (Long & Palermo, 2009). A number of web-based interventions have also proven to be successful. Bender, Radhakrishnan, Diorio, Englesakis, and Jadad (2011) report a small yet encouraging evidence base for such interventions, specifically in treating pain symptoms. There is other evidence that web-based interventions are effective in increasing medication adherence (Linn, Vervloet, van Dijk, Smit, & Van Weert, 2011), reducing anxiety and depression experienced by anorexia nervosa caregivers (Grover et al., 2011), and increasing ADHD knowledge, teaching competence, and perceived classroom control in teachers of students with ADHD (Barnett, Corkum, & Elik, 2011). Among injured children web-based interventions have been shown to reduce child anxiety (Cox, Kenardy, & Hendrikz, 2010), child depression (Wade, Walz, Carey, & Williams, 2008), parent depression (Wade et al., 2008), parent-child conflict (Wade et al., 2008), and child internalizing behaviors (Wade et al., 2008). Web-based methods have also been successful in increasing fruit and vegetable consumption and physical activity while also reducing blood pressure and waist-to-hip ratios among Chinese-American adolescents (Chen, Weiss, Heyman, Cooper, & Lustig, 2011). Tenkku et al. (2011) aimed to lower the risk of alcohol-exposed pregnancies in a community by providing mail-based or online health education and personalized modules for behavior change. Although the groups were equivalent in the number of

women who had quit drinking completely, the online group (82.4%) was more likely than the mail-based group (28.6%) to complete all modules.

Smart Phone Application Interventions. Wolfenden, Brennan, and Britton (2010) denote a smart phone as being a cell phone equipped with a camera, internet access, motion sensors, a Global Positioning System (GPS), and other advanced computer technologies. Smart phone users also have the opportunity to download programs or applications to their phone. The use of smartphone applications for behavioral intervention is growing-- in 2010, 5,805 applications related to health, medicine, or fitness were identified in the iTunes AppStore (California Healthcare Foundation, 2010). Additionally, Luxton, McCann, Bush, Mishkind, and Reger (2011) conducted a review of Blackberry App World applications and uncovered more than 200 applications related to behavioral health. Swendeman and Rotheram-Borus (2010) predict that in the next 5-10 years, interventions delivered via smart phone will be widely disseminated because people will be able to access engaging and lower-cost interventions [for STD/HIV prevention and treatment].

Luxton et al. (2011) provide a list of smart phone application examples related to psychology and/or behavior demonstrating the wide-range applicability of such apps. Such examples include applications for developmental disorders, mood disorders, anxiety disorders, eating disorders, sleep disorders, cognitive disorders, and substance use. Another review in 2011 looked specifically at applications in iTunes that monitor alcohol-related behaviors (Cohn, Hunter-Reel, Hagman, & Mitchell, 2011). A large number of applications (n=222) related to reducing alcohol consumption were discovered. Abroms, Padmanabhan, Thaweethai, and Phillips (2011) found 47 applications for smoking cessation via the iTunes downloading store. Smart phones have also been used to support memory functioning in individuals with Alzheimer's (De Leo, Brivio, & Sautter, 2011), assist children with Autism Spectrum Disorder in acquiring increased social and vocational skills (Burke, Andersen,

19

Bowen, Howard, & Allen, 2010), and provide child home-safety training for families with young children (Jabaley, Lutzker, Whitaker, & Self-Brown, 2011).

While the evidence for smart phone applications as an intervention modality is still emerging, several studies document success. One study provided dialectical behavioral therapy skills training to individuals with borderline personality and substance use disorder via smartphone application (Rizvi, Dimeff, Skutch, Carroll, & Linehan, 2011). This application successfully reduced emotion intensity, desire to use substance, level of general distress, and depression. Smartphone applications have also been successfully employed to increase healthy eating and physical activity (Hijazi, 2012), decreased BMI, weight, and fat mass (Lee, Chae, Kim, Ho, & Choi, 2010) and reduce depressive symptoms (Burns et al., 2011).

Videoconferencing Interventions. Videoconferencing has been used to address mental health concerns for decades. The first documented use of telehealth dates back to 1959 (Brown, 1998). Videoconferencing interventions allow a client and provider to see one another while communicating, allowing for a more traditional face-to-face treatment session. The ability of the client and provider to see one another allows each to see the body language of the other and also enhances the personal element of the therapeutic relationship. Intervention through videoconferencing can also increase access to care by reducing a patient's travel time, travel expenses, time off work spent traveling, and wages associated with missed work (Sato, Clifford, Silverman, & Davies, 2009). A group of women who received counseling for breast and/or ovarian cancer via telehealth indicated that care via this modality saved them the time and costs associated with travel (Zilliacus et al., 2010).

Videoconferencing has also been demonstrated as cost-effective, particularly in rural areas (Harley, 2006; Richardson, Frueh, Grubaugh, Egede, & Elhai, 2009). This is particularly true given the steadily declining price of technology and the stable or increasing costs of medicine and travel (Richardson et al., 2009). McConnochie et al. (2009) provided an illustrative example of the cost-

effectiveness of telehealth interventions. In two similar groups of children, both were provided with physician and emergency department care. However, only one group had access to videoconferencing for healthcare. Individuals with telehealth access had 22% fewer visits to the emergency room as compared to the control group. Because a trip to the emergency room costs approximately seven times that of a videoconferencing session, significant cost savings were seen in the videoconferencing supplemented group. An additional study found substituting telehealth clinical interviews for in-person interviews produced annual savings of $8,000 for new telehealth clinics and $12,000 for existing clinics (Shore, Brooks, Savin, Manson, & Libby, 2007).

Not only is videoconferencing one of the oldest forms of technological intervention, but it also has the largest empirical base among technological interventions (American Telemedicine Association, 2009). Videoconferencing interventions have been used to treat many populations with a variety of psychological or physical ailments. A review by Richardson et al. (2009) found videoconferencing interventions applied to substance use, mental health care for deaf individuals, mood disorders, anxiety disorders, and cancer patients with adjustment disorder. In addition, videoconferencing has also been used in interventions for depressed populations (Dobscha, Corson, Solodky, & Gerrity, 2005), individuals with obsessive-compulsive disorder (Himle et al., 2006), senior citizens with mild cognitive deficits (Poon, Hui, Dai, Kwok, & Woo, 2005), rural teens with epileptic disorders and their parents (Glueckauf et al., 2002), and breast cancer support groups (Collie et al. 2007).

Videoconferencing can also be an opportunity for consultation and professional collaboration. In one videoconferencing application behavioral consultants educated preschool staff members about behavior modification for children with autism via videoconferencing (Gibson, Pennington, Stenhoff, & Hopper, 2010). Following this training, the behavioral consultants observed the classroom (including a student with autism) through videoconferencing to evaluate the implementation of the

21

training. In providing this training via videoconferencing, preschool staff and behavioral health consultants were able to meet more frequently for longer periods of time and save money because the consultants were not required to travel to the site (Gibson et al., 2010). Oftentimes experts of varying health conditions may be sparse, particularly in a rural region. If a family or organization is in need of expert opinion, travel and related expenses may be burdensome. However, allowing experts to meet via videoconferencing makes obtaining expert opinion or observation a more feasible option.

Interventions via telehealth have produced significant improvements for distressed populations. A review conducted by Backhaus et al. (2012) examined psychotherapy interventions applied via two-way videoconferencing. Overall, videoconferencing interventions were successful in reducing symptoms associated with mood disorders, anxiety disorders, eating disorders, physical concerns (e.g., chronic pain, epilepsy), and addiction. As an illustrative example, one study applied a smoking cessation intervention to rural residents via telehealth (Carlson et al., 2012). A group of urban individuals ($n=370$) received the intervention in a face-to-face method while rural individuals ($n=184$) received it via telehealth. While no statistically significant differences emerged, differences in quit rates were observed. While available short-term quit rates for urban participants were slightly higher compared to the rural group (39.2% at 3 months and 45.5% at 6 months urban; 37.2% at 3 months, 37.7% at 6 months rural), quit rates among the rural telehealth participants were higher at 12 months (71.2% vs. 61.9%). Other examples have found telehealth interventions to be effective in reducing Post-Traumatic Stress Disorder and depressive symptoms among a rural sample of domestic violence or sexual assault victims (Hassija & Gray, 2011) and as effective as in-person treatment for providing cognitive-behavioral therapy to children with depression (Nelson, Barnard, & Cain, 2003).

In addition to producing successful results, telehealth services are also consumer-friendly, with a number of recipients reporting satisfaction with services. Backhaus et al. (2012) also reviewed studies examining both satisfaction and the therapeutic alliance within the context of

videoconferencing psychotherapy. Sixteen articles within the review evaluated the therapeutic

relationship via videoconferencing, with 87% of studies reporting a strong therapeutic alliance.

Additionally, 26 articles within this review examined provider and/or patient satisfaction with

videoconferencing services. Overall, studies comparing videoconferencing and in-person treatment

reported comparable satisfaction levels, and studies without a comparison group also reported high

satisfaction. Backhaus et al. (2012) note that most reported dissatisfaction was due to technical

difficulties with videoconferencing equipment. Some studies have also found that participants in fact

preferred the videoconferencing delivery method. A study by Morgan et al. (2011) used telehealth to

supplement in-person memory clinic treatment. While the in-person and videoconferencing services

produced similar levels of satisfaction, the videoconferencing services were ranked as more

convenient. Clients in a study by Simpson (2001) valued the ability to access a therapist outside of

their local community, reporting that this enhanced the confidentiality of services. Many clients from

this study also reported that the therapeutic alliance was enhanced by videoconferencing, feeling this

modality reduced self-consciousness and confrontation (Simpson, 2001). In the study by Nelson et al.

(2003) participants reported overall satisfaction with the videoconferencing treatment, with 78% of

participants in the videoconferencing condition reporting preference for seeing a therapist via

teleconferencing as opposed to in-person.

Rural Uptake of Technological Interventions for Behavioral Health

       Access to Technology and the Digital Divide. According to the U.S. Department of

Commerce (2011), 77% of households in American own a computer, and 71% have internet access

within the home. However, this access is not uniform across all demographic groups. The term

"digital divide" refers to the gap between those with access to technology, and the information to be

gained through technology, and those without such ready access (Cullen, 2001). Access to technology

may differ, for example, based on age, race, socioeconomic status, and area of residence.

The U. S. Department of Commerce (2011) provides statistics on technology use based on the Census Bureau's 2010 Current Population Study School Enrollment and Internet Use Supplement. Approximately 54,000 households were surveyed via personal and telephone interview. A nationally representative list of landline and cellular phone numbers were selected by random digit dial for the study. Results from this study support the digital divide concept across a range of groups. For example, this study found that individuals over 65 report having access to household computer and internet less frequently than younger counterparts. In addition, this study found Asian and White individuals report having a household computer and internet more frequently than Black and Hispanic individuals. Higher levels of household income and education were also related to higher percentages of household computer and internet access. Importantly, these data also indicate a digital divide between rural and urban residents, with rural households more likely than urban to report no internet access inside or outside the home (28% vs. 18%), no household computer (30% vs. 22%), dial-up internet use (5% vs. 2%), and internet access exclusively outside the home (11% vs. 9%).

While this research indicates that rural individuals have less access to computers and the internet than their metropolitan counterparts, it is plausible that certain groups residing in rural areas may have even less access to technology depending on income, age, race, and education levels. Given these disparities, it is possible that rural individuals have less access to other types of technology beyond internet and computer. Currently, however, there are no published data examining the range of technology use in rural areas. While the U. S. Department of Commerce offers rural-urban comparison data for internet and computer access and use, other technologies were not included. Additionally, the Pew Internet and American Life Project publishes a thorough amount of data regarding American technology use. Upon thorough review however, only smart phone ownership and internet use rates provide rural-urban comparison data. In order to assess potential uptake and

acceptance of technologically delivered care, rural individuals' ownership and use of the gamut of technologies should and are assessed.

Access to Technology and Willingness to Seek Services via Technology. It is currently unknown to what extent technology access and use influences a person's willingness to seek healthcare services via technology. Several studies have reported prior use of and current accessibility to a specific technology as being positively related to future use of that same technology (Gerstberger & Allen, 1968; Jackson, Chow, & Leitch, 1997; O'Reilly, 1982; Rice & Shook, 1988). To date, only one study has examined the relationship between technology use or access and adoption of a different technology. A study by Christensen, Anakwe, and Kessler (2001) examined the relationship between technology familiarity and access and distance learning receptiveness. Specifically, use of e-mail, internet, videoconferencing, news and discussion groups, electronic bulletin boards, chat rooms, and FTP (assumed to be File Transfer Protocol) was assessed as well as access to 15 differing technologies. Three receptiveness variables were included in analyses (general receptiveness and receptiveness towards distance learning using interactive vs. noninteractive technologies). Results showed that technology use was significantly and positively related to general and interactive distance learning receptiveness, while access was not related to any of the three receptiveness variables.

While this study has some important implications, it is inappropriate to draw large conclusions as it appears to be the only study examining this relationship to date. If found to be a general trend, the significant relationship between technology use and receptiveness, but not access, could guide researchers in increasing the uptake of technological interventions. Specifically, providing access to technology may be insufficient, while those already using technologies may be the audience of interest when seeking to implement such interventions.

Critical Variables Linked to Behavioral Healthcare Service Uptake. The utility of technology in decreasing barriers to care should be considered win the context of other variables

shown to impact help seeking. Caregiver strain, severe child concerns, and prior service seeking

increase the likelihood of mental health service use, while stigma and logistical barriers to care have

been shown to decrease service use.

First, caregiver strain has been linked to certain service uptake behaviors. Specifically,

significant caregiver distress drives increased uptake of behavioral healthcare within the pediatric

population (Brannan, Heflinger, & Foster, 2003). In one study caregivers reporting that child behavior

impacted the family were more likely to use behavioral healthcare by at least two times (Farmer,

Burns, Angold, & Costello, 1997). High levels of parental distress are also associated with mental

health service use among families with children at high risk for Attention Deficit-Hyperactivity

Disorder (Bussing et al., 2003) and adolescents enrolled in a form of public care (Garland, Aarons,

Brown, Wood, & Hough, 2003). Caregiver strain has also been linked to increased use of inpatient

psychiatric services and nonspecialty behavioral care (physician, hospital, in-home therapist) for

children with anxiety disorders in public care (Chavira, Garland, Yeh, McCabe, & Hough, 2009) and

increased use of school-based mental healthcare for children and adolescents (Burnett-Zeigler &

Lyons, 2010).

Second, the type and severity of child concerns has also been linked to increased service use.

One study found both internalizing and externalizing behavior concerns are positively related to

caregiver strain (Brannan & Heflinger, 2006). Another study found disruptive behavioral disorders,

but not depressive disorders, are related to increased behavioral healthcare use (Wu et al., 1999).

Thompson and May (2006) similarly found that externalizing behavior concerns were predictive of

receiving mental healthcare services. While internalizing behavior concerns increased the perceived

need for mental healthcare on the caregiver's behalf, it was not significantly related to an increase in

obtaining such services (Thompson & May, 2006). Severity of symptoms or concerns has also been

linked to increased service use among for children and adolescents (Merikangas et al., 2011; see

Zwaanswijk, Verhaak, Bensing, Ende, & Verhulst, 2003 for review). The severity of a child's mental health concerns has also been shown to differentiate between use of formal and informal services for mental health (Srebnik, Cauce, & Baydar, 1996). Thurston (2010) found that for every point increase in perceived severity of externalizing behavior concerns, parents were three times more likely to endorse help-seeking.

Third, there is preliminary evidence for a relationship between prior service seeking and increased willingness to seek treatment. One rural study among Iowan adolescents with comorbid mental illness and substance use found that those who had received mental health treatment in the past were more likely to receive mental health and substance use services independently, as recommended by service guidelines (Anderson & Gittler, 2005). A recent study by Polaha and Williams (manuscript in preparation) showed that parents of children in rural Appalachia who had previously sought services from a counselor, therapist, or psychologist reported greater willingness to get a range of mental health services in the future and reported fewer barriers to doing so.

Finally, barriers to care also impact service seeking behaviors. While caregiver strain, severity of concerns, and prior service use are positively related to service use, both stigma and logistical barriers are negatively related to behavioral healthcare uptake. Specifically, those experiencing stigma around mental health report less willingness to seek mental health services (Hoyt et al., 1997).

Polaha and Williams (manuscript in preparation) found that self and public stigma predicted less willingness to "see a psychologist, counselor, or therapist" in a behavioral health setting but not in other settings. Logistical barriers, including cost and time associated with travel, poverty, lack of insurance, and provider shortages, also make access to treatment difficult. As reviewed earlier, such concerns have been identified as barriers to psychological care and have been linked to fewer healthcare visits.

Each of the five critical variables (caregiver strain, previous service seeking, severity of concerns, barriers to care, and stigma) has been linked to service seeking patterns. However, these relationships are all within the context of traditional mental health service delivery. It is unknown to what degree these variables impact the uptake of innovative mental health services. It is plausible that these findings may lack significance when a technological modality of mental health care is entered into the relationship.

Study

Rural residents encounter a number of barriers in accessing behavioral healthcare. While technology presents a unique opportunity for increasing access, the use of various technologies in rural areas is currently unknown. In addition, the extent to which technology use impacts willingness to seek care via technology is also unknown. Finally, research has identified several critical variables related to increased behavioral healthcare service use; however, there is no published data examining their relationship to technologically-mediated behavioral healthcare use. The present study was designed to address these gaps in the literature.

This study used existing data collected in the context of a larger study to achieve three primary aims:

1. To examine the use of a variety of technologies in rural areas through self-reported technology use.

2. To examine the relationship between technology use and willingness to access mental health services for children through two-way videoconferencing.

3. To examine the relationship between technology use and willingness to seek services for children in the context of other critical variables regarding service uptake including stigma, previous service seeking, logistical barriers to care, severity of concerns, and caregiver strain.

I hypothesized that there will be a significant and positive relationship between technology use and willingness to seek help via two way videoconferencing. Given the exploratory nature of aims one and three, no explicit outcomes are hypothesized. Results of this study will provide a starting point for researchers in the development and dissemination of technologically based mental health interventions for rural communities.

CHAPTER 2

METHODS

Recruitment Locations

Data were collected at two pediatric outpatient clinics: East Tennessee State University

(ETSU) Pediatrics and Mountain View Pediatrics. ETSU Pediatrics, a department within ETSU's

Quillen College of Medicine, employs five licensed physicians and about 15 medical residents. It is

located in Johnson City, Tennessee, within Washington County. According to the most recent

estimates, Johnson City has a population around 64,000 and covers 42.94 square miles (U.S. Census

Bureau, 2013). Mountain View Pediatrics is a private, stand-alone primary care practice located in

Marion, Virginia, within Smyth County. According to the most recent estimates, Marion has a

population of approximately 6,000 covering 4.12 square miles (U. S. Census Bureau, 2013).

As previously reviewed, Rural-Urban Continuum Codes (RUCC) refer to a nine-point system

for metropolitan-nonmetropolitan county classification with higher numbers referring to more rural

counties (United States Department of Agriculture, 2012). According to the most recent update of

RUCC scoring in 2003, Washington County, Tennessee has a RUCC score of three and a population

of more than 107,000 while Smyth County, Virginia, has a RUCC score of six with a population of

slightly more than 33,000 (United States Department of Agriculture, 2003). According to the U.S.

Census Bureau (2013), poverty rates in Johnson City, Tennessee, and Marion, Virginia, are almost

identical. However, educational attainment and household income is higher in Johnson City,

Tennessee. The median household income in Johnson City, Tennessee, is $37,284.00, compared to

$31,470.00 in Marion, Virginia. Additionally, levels of high school completion appear to be higher in

Johnson City (86.6% vs. 79.5%) as well as college completion rates (35.3% vs. 18.0%).

Participants and Data Collection

Research assistants recruited adults accompanying children between the ages of 4 and 16 in pediatric primary care waiting rooms. Those willing to participate completed a packet of measures assessing demographics, child psychosocial concerns, technology use, stigma, and help-seeking behaviors while in the waiting room or during the primary care visit. The parents returned the packet to the research assistant and were compensated with 10 dollars cash. This study protocol was reviewed and approved by the East Tennessee State University Institutional Review Board.

Measures

The following measures can be found in Appendix A:

Demographics. This measure consists of 13 items assessing different demographic variables including child age, date of birth, sex, county of residence, and zip code; the participant's relationship to the child, his or her racial or ethnic group, and the father and mother's highest level of education. In addition, the demographics measure contains questions assessing the child's health on the day of survey completion, the child's overall health, and with whom the participant has discussed child concerns. "Talking to a counselor or therapist" for concerns regarding the child or another family member was used as a proxy for previous service seeking.

Pediatric Symptom Checklist. The Pediatric Symptom Checklist (PSC; Jellinek, Murphy, & Burns, 1986) is a 35-item measure assessing child psychosocial concerns. Specific child behaviors are listed and participants rank these behaviors as occurring "never", "sometimes", or "often". Three subscales can also be calculated, measuring externalizing, internalizing, and attention-related behavioral concerns. The PSC has shown to be both reliable and valid in several studies including strong test-retest reliability (Jellinek et al., 1988) and internal consistency (Murphy et al., 1996). PSC scores have been found to agree highly with other well-researched measures of child behavior and psychosocial concerns including the Children's Behavior Checklist, the Global Assessment Scale, and

the presence of psychiatric diagnoses (Jellinek et al., 1999). Within this study the Cronbach's alpha for the measure was .93.

Choices for Getting Help (Settings). The Choices for Getting Help questionnaire is divided into two measures (Polaha & Williams, manuscript in preparation) assessing a participant's willingness to discuss child behavioral concerns with various professionals and in a variety of settings. For the purposes of this study, only the second measure focusing on settings was used. This measure is composed of six items assessing previous psychological service use or willingness to seek future services in a variety of settings (e.g. psychologist, counselor, or therapist in the school, doctor's office, private office, behavioral health center, two-way videoconferencing). Participants responded using a six-item Likert scale. A particular focal point of this study (willingness to use two-way videoconferencing to meet with a therapist) was assessed via single item within this measure. The specific item reads, "I would take my child to my local hospital to a room with special equipment that would allow me to meet with a counselor, therapist, or psychologist over the television in two-way videoconferencing." The overall measure was found to have strong internal consistency (11 items; $\alpha=.78$).

Parents' Perceived Stigma of Service Seeking. The Parents' Perceived Stigma of Service Seeking measure (PPSSS, Williams & Polaha, under review) is composed of 18 statements assessing anticipated stigma related to a child receiving behavioral services from a counselor, therapist, or psychologist. Seventeen of the 18 items have been previously validated (Williams & Polaha, under review). This measure assesses perceived public and self-stigma. Each statement was answered using a six-point Likert scale. Some items include anticipation of feeling strange, embarrassed, or weak, being looked down upon by others, worrying others would find out, and feeling defective. Also, anticipation of unfair treatment by others, town gossip, and disrespect and avoidance by others were assessed. The PPSSS consists of two factors (public and self-stigma) and is both reliable and valid as

compared to previously validated measures for assessing stigma. Internal consistency for this measure was strong (α=.96).

Barriers to Getting Help for My Child. The Barriers to Getting Help for My Child measure (adapted from Brannan & Heflinger, 2006) consists of 13 items assessing barriers to care. Participants were asked to check difficulties anticipated in choosing to get behavioral help for their child from a counselor, psychologist, or therapist. Such difficulties include child refusal, lack of finances, lack of transportation, inconvenient appointment times, concerns about insurance reimbursement, lack of appropriate providers, and fear of external labels being applied to the child. This measure was found to have high internal consistency (α=.79).

Caregiver Concerns. The 21-item measure of Caregiver Concerns (Brannan, Heflinger, & Bickman, 1997) assesses how much strain is encountered by caregivers of children. Specifically, consequences of child problems within the previous 6 months are assessed on a 5-point Likert scale. These include duty neglecting, physical or mental health decline of family members, financial strain, and family relationship and social disruption as results of child behavior. Embarrassment, social isolation, guilt, and worry within the previous 6 months are also included. Internal consistency was strong (α=.95).

Use of Technology. The Use of Technology measure was developed for this study in an effort to assess participants' use of various technologies. A comprehensive literature search revealed no measures assessing multiple facets of technology ownership and use. While several measures related to technology use exist, many of these focus on a particular type of technology, attitudes towards technology, or very specific behaviors related to technology. Such measures were reviewed to generate ideas of what facets of technology should be incorporated into the technology use measure. Reviewed existing measures with some overlap with the purposes of this study include the Facebook Intensity Scale (Ellison, Steinfield, & Lampe, 2007), the Technology Experience Questionnaire (Czaja

et al., 2006a), and the Computer Use Scale (Panero, Lane, & Napier, 1997). This technology measure was found to be highly reliable (27 items; α=.79).

The Use of Technology measure consists of seven items. The first item assesses owned electronic devices including desktop and laptop computers, prepaid and contracted cell phone, smart phone, e-reader, landline telephone, electronic music player (mp3 or iPod), and digital camera. The second item assesses how often the participant engages specific technological functions including text messaging, e-mail, social networking, instant messaging or chat, Skype or Facetime, and a landline phone. Also, the frequency of cell phone calls, cell phone internet use, and cell phone application use is assessed. The third item assesses the number of social networks to which the participant belongs. The fourth and fifth questions assess the number of hours devoted daily to personal and work-related electronic use. The final two questions assess presence and type of household internet access (DSL, dial-up) and daily use of the internet.

Initial Data Analysis Plan

The following outlines the initial data analysis plan as approved during the thesis proposal. Frequencies and descriptive statistics would be used to preliminarily examine the range of technology use in two Appalachian regions. It was planned that regression analyses would then be conducted to examine the relationship between technology use and willingness to receive behavioral services via videoconferencing. Simultaneous regression analyses would first be conducted on demographic variables to assess for possible predictive power related to willingness to receive behavioral healthcare via videoconferencing. If any of these relationships were significant, a hierarchical regression analysis would then be conducted in which significant demographic variables would be entered into the first step, with technology use being regressed on willingness to receive behavioral healthcare via videoconferencing in step two. In the event that no demographic variables were significant, bivariate regression was to be used. The "willingness to receive services via videoconferencing" variable

within this study is a single-item dependent variable. Finally, to examine the predictive power of

technology use within the context of other critical variables, it was planned that hierarchical regression

would again be used. Within the first step, significant demographic variables would be regressed on

willingness to receive behavioral healthcare services via videoconferencing. Within the second step,

technology use would be entered. Finally, caregiver strain, barriers to care, stigma, severity of child

concerns, and previous service seeking were to be regressed on willingness to receive behavioral

healthcare via videoconferencing. Conducted data analyses are described within the results section.

CHAPTER 3

RESULTS

Participants

Adults accompanying children to pediatric primary care appointments were surveyed (*N*=184). Ninety-one participants were surveyed in Johnson City, Tennessee, and 92 were in Marion, Virginia (missing=1). The average child age was 8.68 years (*SD*=3.62) with the majority of children being male (*n*=105; 57.1%). A majority of children within the sample were white (*n*=164; 89.1%). Fewer numbers of children were black (*n*=6; 3.3%), white Hispanic (*n*=4; 2.2%), black Hispanic (*n*=2; 1.1%), or "other" (*n*=7; 3.8%). The majority of participants were mothers (*n*=151; 82.1%), while 8.7% (*n*=16) of participants were fathers, and 9.2% (*n*=17) identified themselves as "other" (e.g. grandparent). Parent educational attainment was also assessed. High school completion was cited most frequently (*n*=92, 50.0% of mothers; *n*=88, 47.8% of fathers), with few parents completing a 4-year degree or beyond (*n*=27, 14.7% of mothers; *n*=25, 13.5% of fathers). Regarding previous service seeking, 31.5% of participants (*n*=58) reported previously talking to a counselor or therapist regarding concerns for the child.

An independent samples t-test was used to assess differences in participant groups based on clinic site. No significant demographic differences emerged between groups except current rating of child health. Individuals in Marion, Virginia, rated their child's current health as poorer than those in Johnson City, Tennessee (*M*=3.27 Marion vs. *M*=3.65, p<.05).

Aim One

The first aim of this study was to examine the range of technologies used within the rural sample. Descriptive statistics and frequencies were used to address this aim. Chi-squared analyses and independent samples t-tests were also used to examine differences in technology use by clinic location.

Technologies Owned. Data for owned technologies are reported in Table 1. With regard to the sample as a whole, a majority of individuals own computers (both desktop [n=105, 57.1%] and laptop [n=110, 59.8%]) and digital cameras (n=147, 79.9%). A majority of the sample also reported having a landline in the home (n=107, 58.2%), but a larger percentage reported owning a cell phone with an annual contract (n=137, 74.5%). Ownership of smart phones and e-readers were reported with less frequency.

In comparing the two clinic sites, differences in technology ownership emerged. In the chi-squared analyses, a statistically significant difference in ownership of desktop computers (χ^2(1, n=181) = 3.99, p<.05) and telephone landlines (χ^2(1, n=181) = 9.33, p<.01) emerged between clinic locations with more individuals reporting ownership of desktop computers and landline phones within the home in Marion, Virginia. While not statistically significant, more participants in Johnson City reported smart phone ownership than those in Marion (n=36, 39.6% Johnson City vs. n=30, 32.6% Marion) while Marion participants more frequently reported prepaid cell phone ownership than those in Johnson City (n=31, 33.7% Marion vs. n=21, 23.1% Johnson City).

Table 1
Percentage of Individuals Owning Specific Technologies

Technology	ETSU Pediatrics (Johnson City, TN)			Mountain View Pediatrics (Marion, VA)			TOTAL		
	% Owned	% Do Not Own	% Missing	% Owned	% Do Not Own	% Missing	% Owned	% Do Not Own	% Missing
Desktop Computer*	49.5	48.4	2.2	65.2	34.8	0	57.1	41.8	1.1
Laptop Computer	61.5	36.3	2.2	57.6	42.4	0	59.8	39.1	1.1
Telephone (land line)*	46.2	51.6	2.2	69.6	30.4	0	58.2	40.8	1.1
Prepaid Cell Phone	23.1	74.7	2.2	33.7	66.3	0	28.8	70.1	1.1
Cell Phone with Annual Contract	73.6	24.2	2.2	75.0	23.9	1.1	74.5	23.9	1.6
iPod/MP3 Player	39.6	58.2	2.2	45.7	54.3	0	42.4	56.5	1.1
Digital Camera	75.8	22.0	2.2	83.7	16.3	0	79.9	19.0	1.1
iPad/Kindle or other e-reader	24.2	73.6	2.2	17.4	82.6	0	20.7	78.3	1.1
Smart Phone	39.6	58.2	2.2	32.6	67.4	0	35.9	63.0	1.1

*p<.05 in chi-squared test

Frequency of Technology Use. In looking at the total sample, cell phone calls (n=119, 64.7% 3+ times daily) and texting (n=114, 62.0% 3+ times daily) appear to be used most frequently. Skype/Facetime (n=4, 2.2% 3+ times daily) and instant messaging technologies (n=19, 10.3% 3+ times daily) appear to be used with the least frequency. Technology use data for the entire sample are reported in Table 2.

Table 2
Percentages of Reported Frequency of Use: TOTAL

	3+ times/day	1-2 times/day	1-2 times/week	Less than once/week	Never	Missing
Telephone (land line in house)	25.5%	19.6%	6.5%	6.5%	22.3%	19.6%
Cell Phone (phone calls only)	64.7%	20.7%	4.9%	2.7%	3.3%	3.8%
Cell Phone (internet use only)	29.9%	10.9%	5.4%	6.5%	33.7%	13.6%
Cell Phone (app use only)	20.7%	8.2%	6.0%	6.0%	36.4%	22.8%
Texting	62.0%	12.0%	6.0%	6.0%	8.2%	6.0%
E-mail	28.8%	17.4%	13.6%	10.9%	15.8%	13.6%
Social Networking	33.2%	14.7%	16.3%	8.2%	19.0%	8.7%
Instant Messaging/Chat	10.3%	3.8%	9.8%	9.2%	50.0%	16.8%
Skype/FaceTime	2.2%	1.1%	5.4%	6.0%	67.4%	17.9%

Numerous differences emerged in technology use frequency between clinic locations. Reported frequency of landline use was significantly higher at the clinic located in Marion, Virginia, as compared to Johnson City, Tennessee (t=-4.21, p<.01). However, reported frequency of cell phone use for phone calls (t=2.47, p<.05), internet (t=2.45, p<.05), and applications (t=2.17, p<.05) were significantly higher among Johnson City participants than those in Marion. While not statistically significant, Marion participants reported "never" using Skype or Facetime more frequently than participants in Johnson City (n=70, 76.1% Marion, n=53, 58.2% Johnson City). Frequency of use for texting, e-mail, and chat/instant messaging were similar among locations. Technology use data for each clinic location can be seen in Table 3.

Table 3
Percentages of Reported Frequency of Use: By Location

Technology	ETSU Pediatrics (Johnson City, TN)					Mountain View Pediatrics (Marion, VA)				
	3+ times/day	1-2 times/day	1-2 times/week	Less than once/week	Never	3+ times/day	1-2 times/day	1-2 times/week	Less than once/week	Never
Telephone (land line in house)*	15.4	14.3	6.6	7.7	30.8	35.9	25.0	6.5	5.4	13.0
Cell Phone (phone calls only)*	73.6	15.4	3.3	2.2	1.1	56.5	26.1	6.5	3.3	4.3
Cell Phone (internet use only)*	35.2	13.2	3.3	3.3	26.4	25.0	8.7	7.6	9.8	40.2
Cell Phone (app use only)*	25.3	7.7	5.5	2.2	28.6	16.3	8.7	6.5	9.8	43.5
Texting	62.6	12.1	6.6	2.2	7.7	62.0	12.0	5.4	9.8	7.6
E-mail	30.8	19.8	12.1	4.4	15.4	27.2	15.2	15.2	17.4	15.2
Social Networking	36.3	13.2	12.1	7.7	19.8	30.4	16.3	20.7	8.7	17.4
Instant Messaging/Chat	11.0	2.2	6.6	6.6	50.5	9.8	5.4	13.0	12.0	48.9
Skype/Facetime	2.2	0.0	6.6	7.7	58.2	2.2	2.2	4.3	4.3	76.1

*p<.05 in independent samples t-test

Social Network Memberships. The majority of participants reported belonging to at least one social network (*n*=147, 79.9%), with the most commonly reported number of memberships being one (*n*=107, 58.2%). No significant differences between clinic locations emerged in t-test analyses. Social network membership data can be seen in Figure 1.
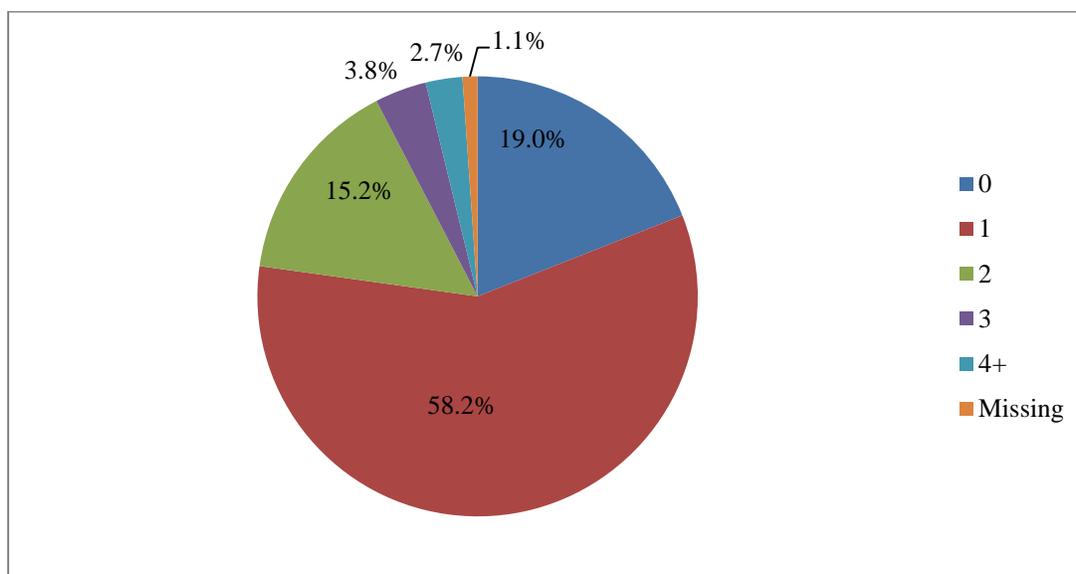
Figure 1. Number of social network memberships

Time Spent Using Electronic Devices for Personal and Work Use. Data for personal electronic use can be seen in Figure 2. Results showed that the majority of individuals spend either less than 1 hour (*n=62, 33.7%*) or 1 to 2 hours (*n=70, 38.0%*) using electronic devices for personal activities daily. Six percent of individuals (*n=11*) reported no daily use of electronic devices for personal activities. No significant differences emerged between clinic locations in t-test analyses.
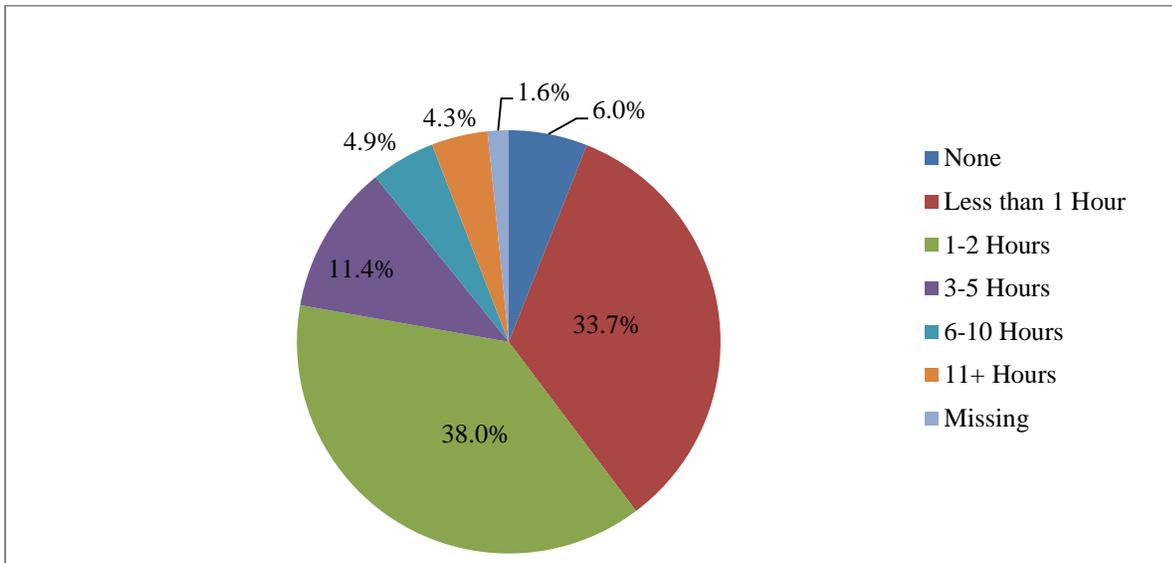
Figure 2. Hours per day on personal activities using electronic device

Data for work-related electronic use can be seen in Figure 3. Nearly one quarter of the participant sample (*n=45*) reported not working. The majority of working participants reported using electronics either less than 1 hour (*n=28, 15.2%*) or 1 to 2 hours daily (*n=31, 16.8%*) for work-related activities. Slightly more than 11% of participants (*n=21*) reported no daily electronic use for work purposes. No significant differences emerged between clinic locations in t-test analyses.
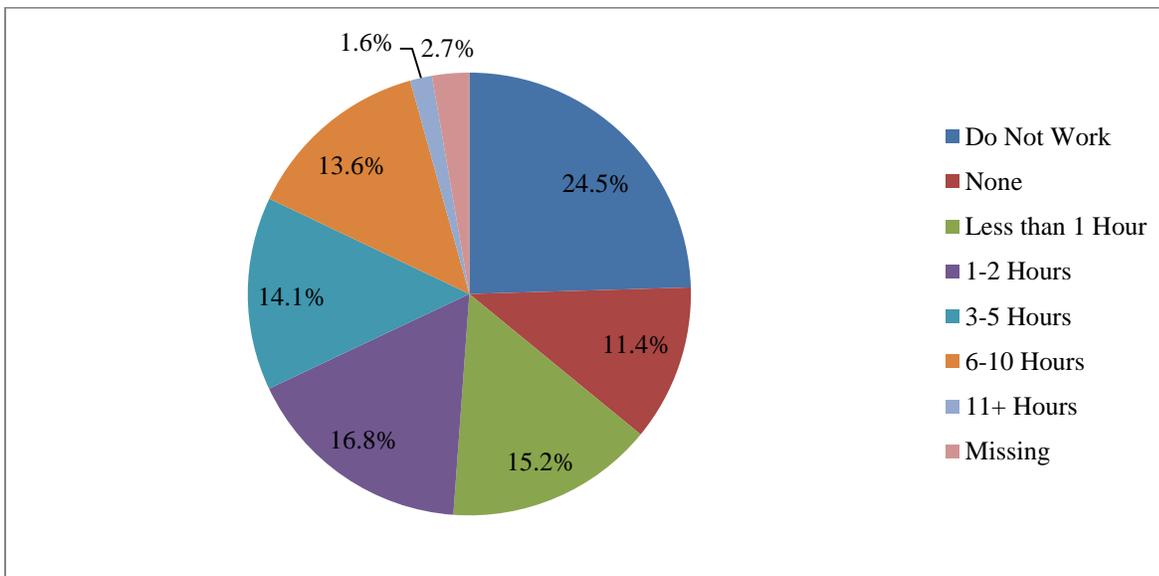
Figure 3. Hours per day on work-related activities using electronic device

Internet Access. Overall, the majority of participants (*n=*119, 64.7%) reported having

DSL/cable/high-speed internet within the home. No household internet was reported by 22.8% of

participants (*n=*42) while 8.2% of participants (*n=*15) reported dial-up internet within the home.

Among those without household internet, cell phones and work were reported as common internet

access points. Homes of others (friend or relative) and the library were also listed.

A significant difference between clinics emerged in lack of household internet access (t=2.12,

p<.05) with lack of household access being more common in Johnson City as compared to Marion

(*n=*26, 28.6% Johnson City vs. *n=*15, 16.3% Marion). While not statistically significant, more

individuals in Marion reported DSL/Cable/High-Speed internet in the home than those in Johnson City

(*n=*67, 72.8% Marion vs. *n=*52, 57.1%).

Daily Internet Use. Reported daily internet use is reported in Figure 4. Overall, the majority

of individuals reported using the internet either less than 1 hour (*n=*69, 37.5%) or between 1 and 2

hours daily (*n=*56, 30.4%). While 10.9% of participants (*n=*20) reported no daily internet use, few

individuals (*n=*10, 5.4%) reported using the internet more than five hours daily. Individuals in the

Marion clinic reported spending significantly more time on the internet daily than individuals in the Johnson City clinic (t=-2.41, p<.05).
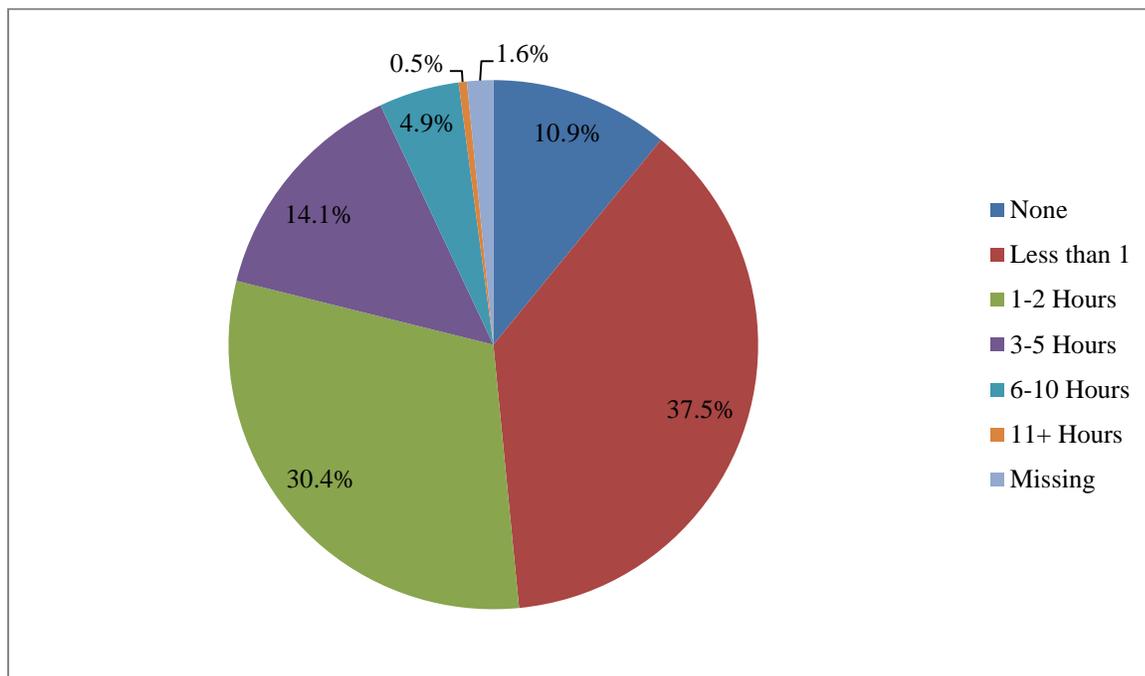
Figure 4. Daily hours of internet use

Aim Two

The second aim of this study was to examine the relationship between technology use and willingness to access pediatric behavioral health services through two-way videoconferencing. To begin, simultaneous regression analyses were conducted on demographic variables to assess for significant predictive power related to willingness to receive behavioral healthcare via videoconferencing. Exploratory analyses were then conducted to gain insight into various methods for scoring the technology use measure. While the initial data plan involved willingness to access mental health services via two-way videoconferencing being regressed on technology use, this analysis was not conducted based upon the results of exploratory analyses.

Demographic Variables. Willingness to access mental health services via two-way videoconferencing was first regressed on demographic variables so that significant demographics could be controlled for in subsequent analyses. Paternal educational attainment was significantly

predictive of willingness to access services via videoconferencing, with a positive beta-value indicating a positive relationship between the two variables (β=.185, p<.05). Child sex was also significantly predictive of willingness to access videoconferencing services (β=-.176, p<.05). Based on child sex coding and the negative beta-value, it is inferred that participants reporting male children were more willing to use videoconferencing for mental health services. No other demographic variables produced significant results.

Endorsement of Using Videoconferencing Services. Participants used a six-point Likert scale to respond to the videoconferencing willingness item, with higher numbers representing higher willingness. For the overall sample, the mean videoconferencing willingness score was 3.21 (*SD*=1.64). Frequencies and descriptive statistics were also conducted by clinic location. Overall, participants in the Mountain View Pediatrics clinic appeared slightly more willing to seek services via videoconferencing than ETSU Pediatrics participants (*M*=3.37, *SD*=1.72 Mountain View vs. *M*=3.04, *SD*=1.54 ETSU). However, based on an independent samples t-test, this difference was not statistically significant.

Exploratory Analyses. Given that the technology use measure was created for the purposes of this study, exploratory analyses were conducted to ascertain the best method for creating a scale score. A series of correlation analyses were conducted.

Technology use sum scores were created to simplify data. Using practical reasoning about the relationship between items as a guide, items were combined as an attempt to strengthen data utility. These sum scores were used to ascertain if a particular facet of technology use (e.g. technology ownership, frequency of use, internet use) was more highly correlated with willingness to seek telehealth services. Each item response was assigned a number, with items endorsing higher/more frequent use of technology being assigned higher numbers. In total, seven sum scores were created: technology ownership (item one), technology ownership with landline excluded (item one minus

landline), technology ownership with household internet access added (items one and six), technology use frequency (item two), and personal and work-related electronic device use (items four and five). Two "sum of sums" variables were also calculated. Technology ownership, frequency, and electronic device use sums along with scores for social network memberships (item three), household internet access (item six), and daily internet use (item seven) were combined for the first "sum of sums" variable. The second "sum of sums" variable included all of the items listed above but the sum combining technology ownership and household internet (items one and six) was used instead of each item being entered independently.

Using theses sum scores, a correlation matrix was created to determine if any of these scores were significantly correlated with willingness to use videoconferencing for mental health services. No significant correlations emerged. Thus, an additional correlation matrix was created examining individual items from the technology use measure and willingness to use videoconferencing for mental health services. Only one item (ownership of an iPod/MP3 player) produced a significant correlation ($r=.176$, $p<.05$). Given the results of these correlations, a regression analysis between technology use and willingness to use videoconferencing for mental health services was not conducted as originally proposed.

Aim Three

The final aim of this study was to examine the relationship between technology use and willingness to seek pediatric telehealth services in the context of other critical variables regarding service uptake. Because the relationship between technology use and willingness to use videoconferencing was not significant, no hierarchical regression analysis was conducted to examine aim three.

Post-hoc Analyses

      While the relationship between technology use and willingness to use videoconferencing services was not significant, the relationship between various critical variables linked to traditional service uptake patterns and willingness to use mental health services via videoconferencing was examined using hierarchical regression. Within the first step, child sex and father educational attainment were entered given the significant relationship between these demographics and willingness to seek mental health services via videoconferencing. In the second step, severity of child concerns, public and self-stigma, caregiver strain, barriers to care, and previous service seeking were entered. While the overall regression model was not significant, previous service seeking for the child ($\beta=.226$, $p<.05$) was significantly predictive of willingness to seek mental health services via videoconferencing.

      In addition to the hierarchical regression analysis, a correlational matrix was created to examine the possibility of additional unanticipated relationships. The matrix was composed of all technology variables, technology sum scores, willingness to use videoconferencing, and variables included in aim three (stigma, severity of concerns, previous service seeking, caregiver strain, and barriers to care). No relevant correlations emerged as significant.

CHAPTER 4

DISCUSSION

Within this study, I sought to evaluate technology use in a rural sample and its relationship to willingness to seek technologically delivered services (videoconferencing, specifically).

Prevalence of Technology Access

Several technologies emerged as being highly owned and used by study participants. A majority of participants reported owning a digital camera, a cell phone with an annual contract, a laptop, a landline phone, and a desktop computer. Text messaging and cell phone calls emerged as the most frequently used technology with more than 60% of participants using these technologies more than three times daily. Approximately 80% of participants reported belonging to at least one social networking site, with about 50% of participants reporting at least daily use. In looking at internet access and use, slightly less than a quarter of participants reported no home access and around 8% of participants reported dial-up internet within the home. The majority of participants reported less than 2 hours of internet use daily.

In comparing rural sample data and national data, evidence for a rural-urban digital divide is revealed. First, sample smart phone ownership rates are lower than national comparison data, with ownership being lowest within the more rural sample (35.9% total sample, 39.6% ETSU, 32.6% Mountain View vs. 45% national sample; Pew Internet and American Life Project, 2013). Second, landline ownership among Mountain View Pediatrics participants was higher than national data. As of 2012, 34% of adults had only wireless phones and 1.9% had no telephone service, meaning approximately 64% of Americans *do* have landline telephones within the home (Blumberg & Luke, 2012). While participants in the ETSU Pediatrics location reported a lower ownership rate of landline phones, Mountain View Pediatrics participants reported slightly higher landline ownership than the national rate of landlines mentioned above (46.2% ETSU vs. 69.6% Mountain View). While initially

counterintuitive, this increased presence of landline phones in the more rural sample is evidence for

the rural-urban digital divide, as the number of cell phone-only households are increasing with time

(Blumberg & Luke, 2012). While national and sample data are relatively equivalent for high speed

internet within the home (64.7% sample vs. 65% national), dial-up internet is more prevalent within

the Appalachian sample (8.2% sample vs. 4% national; Pew Internet and American Life Project,

2012). This increased rate dial-up internet connection is a third piece of evidence for the rural-urban

digital divide, as rates of dial-up internet adoption have been steadily decreasing since 2002 (Pew

Research Center, 2012).

While comparisons between the rural and national samples offer some evidence for a rural-

urban digital divide, other comparisons were not consistent with this divide. The Pew Internet and

American Life Project provides thorough and frequently updated statistics regarding national

technology use. Data reported by the Pew Internet and American Life Project were collected via

randomly sampled telephone interviews with individuals at least 18 years of age. Comparisons

between the most recent national data and rural sample data show laptop computer, mp3 player, and e-

book ownership rates as comparable (Pew Internet and American Life Project, 2013). While total

sample desktop computer ownership is comparable to the national sample, ETSU Pediatrics

participants reported less ownership and Mountain View Pediatrics participants reported more

ownership compared to the national data (57.1% total sample; 49.5% ETSU, 65.2% Mountain View

vs. 58% national sample; Pew Internet and American Life Project, 2013). Other comparisons found

that the rural sample owned and used technology *more* frequently than the national sample. In

comparing data regarding different cell phone functions, 80% of rural sample participants reported

texting at least weekly while only 61% of individuals in the national sample reported text messaging

use (Pew Research Center, 2011b). More participants in this study also reported using the internet via

cell phone, with 46.2% reporting at least weekly use while only 36% of the national sample reported

use in general (Pew Research Center, 2011b). Internet use also appears to be more prevalent in the study sample; national data report that 80% of adults use the internet, while 90% of study participants reported using the internet *at least daily* (Pew Research Center, 2012). Finally, social network membership was more prevalent within the sample compared to national data (79.9% sample vs. 50% national; Pew Research Center, 2012). Do these comparisons prove the rural-urban digital divide a myth? There are several considerations to keep in mind when comparing the above data. First, some national data used for comparisons were collected at different times than study data (Pew Internet and American Life Project, 2013; Pew Research Center, 2011b; U. S. Department of Commerce, 2011). Given the fast-paced evolution of technology, one should consider the impact of increasing availability and affordability of technology on data comparisons. As an example of the fast-paced evolution of technology, consider Instagram, a social networking application for taking, editing, and sharing photos (Frommer, 2010). As of July 2013, Instagram has approximately 130 million active monthly users, when just 3 years ago this application had not yet been created; Instagram was launched in October 2010 (Instagram, 2013). In addition to the differences in study and national data collection year, the age of sample participants should also be considered. While national samples included individuals of all ages (over 18), the study sample was comprised mostly of parents of the child being seen in the pediatric clinic (90.8%). Because sample participants may have been younger than national study participants, sample statistics may actually overestimate rural technology use as age and technology use are negatively related (U.S. Department of Commerce, 2011).

Availability of technology use statistics for rural areas is relatively limited. In comparing sample data with existing rural household data offered by the U. S. Department of Commerce (2011), sample participants were more likely to report household broadband internet (64.7% sample vs. 57% national rural) and household dial-up internet (8.2% sample vs. 5% national rural). This same report also offers statistics on household broadband internet use by state for both rural and urban areas. Both

clinic locations were more likely to report household broadband internet than rural state comparison data (57.1% ETSU Pediatrics vs. 45.8% Rural TN; 72.8% Mountain View Pediatrics vs. 48.5% rural VA). While sample data were much lower than national rates of smart phone ownership, it was relatively consistent with existing rural data (35.9% sample, 34% rural national; Pew Research Center, 2012).

While initially unexpected, statistically significant differences in technology use emerged between data collection sites. Participants from the more rural site reported more desktop and landline phone ownership, more frequent landline use, and less frequent use of cell phones (for calls, applications, and internet). While not statistically significant, more Mountain View Pediatrics participants reported owning a prepaid cell phone compared to ETSU participants. Surprisingly, ETSU participants were more likely to report no home internet access while more individuals at Mountain View Pediatrics reported DSL/Cable/High-Speed internet in the home (although not statistically significant).

These technology use data have several implications. Cell phones emerged as one of the most frequently owned and used technologies, specifically when used for phone calls or text messaging. In seeking to reduce barriers to care for rural individuals through technologically delivered services, interventions using cell phone calls and/or texting should perhaps be given precedence over other less frequently used technologies. Additionally, while data support the existence of a rural-urban digital divide, rural innovators should not be discouraged by these technological disparities. While frequency of use differs for each technology, a majority of individuals still report owning computers and cell phones as well as using the internet, cell phones (for calls, internet, applications, and texting), e-mail, and social networking. This information can guide innovators in mental health treatment delivery to technologies that are highly used by rural individuals.

Technology Use and Willingness to Use Videoconferencing

The hypothesis predicting a significant and positive relationship between technology use and willingness to use videoconferencing was unsupported by the data. Additionally, four of five variables previously linked to service uptake including stigma, barriers to care, caregiver strain, and severity of child concerns were not significantly related to willingness to use videoconferencing for pediatric behavioral services. Given this lack of significant findings, it is important to explore other possible variables predictive of willingness to use videoconferencing for behavioral health services. Process-oriented concerns (e.g. discussing sensitive topics via technology, never meeting with clinician face-to-face) could perhaps be a barrier for those considering videoconferencing for pediatric behavioral services. Additionally, it is plausible that factors included in existing models of technology adoption are responsible for differing opinions on willingness to use videoconferencing. Such factors may include attitudes towards technology, social influences, perceived ease of use (as included in the model of planned behavior as applied to technology; Morris & Venkatesh, 2000); external variables, perceived usefulness of technology use, perceived ease of technology use, attitudes towards technology, and behavioral intention to use technology impact technology adoption (as included in the Technology Acceptance Model; Legris, Ingham, & Collerette, 2003); and relative advantage over previous options, audience compatibility, ease of use, the option to try a technology without making a great financial or time commitment ("trialability"), and "observability" of technology benefits (as included in the Diffusion of Innovations model; Rogers, 2003; Oldenburg & Glanz, 2008).

Several limitations should be considered when interpreting the lack of significant findings in this study. First, the wording of the question assessing willingness to receive videoconferencing services was specific to a hospital context. The question reads, "I would take my child to my local hospital to a room with special equipment that would allow me to meet with a counselor, therapist, or psychologist over the television in two-way videoconferencing." It is possible that hospital settings

carry negative or unpleasant connotations influencing participant responses. It is equally plausible that participants were unfamiliar with services delivered via this technology. Participants were not given details of telehealth operation within the questionnaire. For this reason, participants may have held distorted views of how these services are delivered. Specifically, possible concerns might include the credentialing and credibility of telehealth providers, confidentiality of services, or the degree of personal responsibility for using the "special equipment". These uncertainties may have negatively impacted participant responses. Future research could benefit from including a description of telehealth services (including confidentiality, provider credentialing, referral process, and expectations for operation of equipment) prior to assessing willingness. A qualitative approach could also be beneficial, in that videoconferencing services could be described verbally, giving participants the opportunity to ask questions about the services. It is important, however, to avoid overemphasizing initial client perceptions of telehealth as perception of these services becomes significantly more positive following utilization (Finkelstein, Speedie, Zhou, Potthoff, & Ratner, 2011).

The specific technologies assessed within the technology use measure should also be considered in interpreting data. Many of the technologies included within this measure are commonly used as a means for social connectivity (e.g. phone, text messaging, social networking). Perhaps, due to this reason, the technology use measure was more reflective of social connectedness than technology fluency. Future research could benefit by assessing technology use specifically for accessing health information. The Pew Research Center (2009) provides extensive data on health information seeking behaviors in America. Use of the internet for seeking out health information is steadily increasing (25% in 2000, 61% in 2009). "E-patient" is the term applied by the Pew Research Center (2009) to those seeking health information online. Because these individuals are currently using technology for health purposes, perhaps the e-patient population would be more willing to use telehealth for behavioral healthcare.

A third consideration for interpreting findings relates to participant overall help-seeking endorsement. While a variety of treatment modalities for pediatric behavioral services were assessed within the Choices for Getting Help (Location) measure, these were not included within study analyses. Perhaps some participants were not interested in any professional mental health services, regardless of how the treatment is delivered. While some individuals may view only videoconferencing services as aversive, others may be disinterested in all mental health services, regardless of whether it was delivered via telehealth, school, church, doctor's office, or psychologist's office.

Several measurement concerns should also be kept in mind when interpreting data. First, the layout of the technology use frequency table within the technology use measure may have skewed findings. Specifically, some participants chose more than one answer within a single technology column and left others blank. It is hypothesized that they unpurposely marked their answer for multiple technologies within one row. Additionally, willingness to use telehealth services was assessed via a single item. This single item proxy was likely less valid and reliable than a more comprehensive, multi-item scale. Finally, the frequencies assessed in item 2 of the technology use measure (technology use frequency) may have not fully captured the extent of a participant's technology use. The most liberal option was "three or more times per day". This answer selection likely captured a large range of technology use frequencies. One participant using a technology three times daily is likely much less familiar with technology than the participant using a technology 30 or more times daily. However, due to the coding of the measure, one could not distinguish between such groups.

Results from this study have several implications for future studies examining technology use and technological venues for psychological service delivery. First, future studies could benefit from assessing a technological resourcefulness as opposed to general technology use. This might aid in

identifying factors predictive of willingness to receive videoconferencing services. Future research in this area could also benefit from examining willingness to receive videoconferencing healthcare services within the context of preexisting models of technology adoption. Researchers could examine the Technology Adoption Model as it applies to the adoption of telehealth. Perceived ease of use, perceived usefulness, and attitudes towards telehealth could be studied. As this model delineates, the relationship between these variables and intent to use telehealth could then be examined. Other models of technology adoption could also be examined within the context of telehealth; however, the uniqueness and limited availability of telehealth technology should be kept in mind when choosing a model. Specifically, variables measuring social pressure (as with subjective norm in the Theory of Planned Behavior model) and advantage over previous technologies (as with relative advantage in the Diffusion of Innovations model) may be less applicable to telehealth technologies. In addition to lack of significant findings between technology use and videoconferencing willingness, this study also failed to establish significant relationships between videoconferencing willingness and four of five variables previously linked to service use patterns. This could represent the idea that motivational factors for technological help-seeking are distinct from those related to traditional help-seeking. Results from this study also emphasize the need for further research regarding the relationship between previous service seeking and willingness to obtain psychological services via videoconferencing. Previous service seeking could be considered to have the least evidence linking it to traditional service utilization patterns among the five critical variables included in analyses. For this reason, more research is also needed examining this relationship.

Synthesis and Future Directions

In addition to differences between national and study sample technology use, differences in technology use also emerged between existing rural samples, the more rural study sample, and the less rural study sample. While there is some evidence for a rural-urban digital divide, comparisons of

53

technology use in more and less rural locations are nonexistent. For this reason, one should not assume rural technology statistics to be representative of all rural locations. Until such data are available, it is important to assess a specific rural community's technological access and fluency prior to intervention development.

It was originally postulated that technology use would be positively related to willingness to use telehealth services. The lack of significance in this relationship suggests technology use does not dictate willingness to seek telehealth services. A different mechanism appears to drive willingness to receive telehealth services. Technologies included in the technology use measure for this study were relatively informal, with many being used largely for social interaction. This informal technology use could be viewed very differently than technology use for receiving healthcare services, particularly those regarding such a sensitive subject. Future research could benefit from assessing more formal means of technology use, such as technological resourcefulness. Examples of this might include paying bills or booking trips online, looking for health information on the internet, using cell phone applications for banking or weight loss, reading the news online or via smart phone application, etc. Technological resourcefulness goes beyond general technology use, examining the intent and purpose of an individual's technology use. Additionally, potential clients may have concerns about technology-delivered mental healthcare not previously considered. Such concerns might include privacy, discomfort in using unfamiliar technology, or the impact of technologically delivered care on the quality of service. However, factors driving technological mental healthcare uptake are currently unknown. A great deal of research is needed to identify facilitators and barriers to mental healthcare delivered via technology.

In addition to no significant relationship between technology use and videoconferencing willingness, four of five variables previously linked to traditional service uptake were also not significantly predictive of videoconferencing willingness. This suggests that factors influencing

technological intervention uptake are divergent from those influencing traditional service uptake.

Beyond this, technological mental health services may be viewed very differently than traditional

mental health services. These findings speak to the need for future work examining potential client

perspectives of technologically delivered mental health services. Qualitative approaches could likely

be formative in understanding how technological mental health interventions are perceived and what

drives their uptake.

REFERENCES

Abroms, L. C., Padmanabhan, N., Thaweethai, L., & Phillips, T. (2011). iPhone apps for

    smoking cessation: A content analysis. *American Journal of Preventive Medicine, 40*(3), 279-

    285. doi: 10.1016/j.amepre.2010.10.032

Agyapong, V. I. O., Farren, C. K., & McLoughlin, D. M. (2011). Mobile phone text

    message interventions in psychiatry: What are the possibilities?. *Current Psychiatry Reviews,7*,

    50-56.

American Telemedicine Association. (2009). *Evidence-based practice for telemental health*.

    Retrieved from http://www.americantelemed.org/docs/default-source/standards/evidence-

    based-practice-for-telemental-health.pdf?sfvrsn=4

Anderson, R. L., & Gittler, J. (2005). Unmet need for community-based mental health

    and substance use treatment among rural adolescents. *Community Mental Health Journal,*

    41(1), 35-49.

Arcury, T. A., Preisser, J. S., Gesler, W. M., & Powers, J. M. (2005). Access to transportation

    and health care utilization in a rural region. *The Journal of Rural Health, 21*(1), 31-38.

Backhaus, A., Agha, Z., Maglione, M. L., Repp, A., Ross, B., Zuest, D., . . .Thorp, S. R. (2012).

    Videoconferencing psychotherapy: A systematic review. *Psychological Services, 9*(2), 111-

    131. doi: 10.1037/a0027924

Baldwin, L., Patanian, M. M., Larson, E. H., Lishner, D. M., Mauksch, L. B., Katon, W.

    J., . . .Hart, L. G. (2006). Modeling the mental health workforce in Washington state: Using

    state licensing data to examine provider supply in rural and urban areas. *The Journal of Rural*

    Health, 22(1), 50-58.

Barnett, B., Corkum, P.,& Elik, N. (2011). A web-based intervention for elementary

school teachers of students with attention-deficit/hyperactivity disorder (ADHD). Online

publication. doi: 10.1037/a0026001

Bender, J. L., Radhakrishnan, A., Diorio, C., Englesakis, M., & Jadad, A. R. (2011). Can

pain be managed through the internet? A systematic review of randomized controlled trials.

Pain, 152(8), 1740-1750.

Bigelow, K. M., Carta, J. J., & Lefever, J. B. (2008). Txt u ltr: Using cellular phone technology

to enhance a parenting intervention for families at risk for neglect. *Child Maltreatment, 13*(4),

362-367. doi: 10.1177/1077559508320060

Bird, D., Dempsey, P., & Hartley, D. (2001). *Addressing mental health workforce needs in

underserved rural areas: Accomplishments and challenges.* Portland, ME: Edmund S. Muskie

School of Public Service, Maine Rural Health Research Center.

Blair, B. L., & Fletcher, A. C. (2011). "The only 13-year-old on planet earth without a cell

phone": Meanings of cell phones in early adolescents' everyday lives. *Journal of Adolescent

Research, 26*(2), 155-177.

Blumberg, S. J., & Luke, J. V. (2012). Wireless substitution: Early release of estimates from the

National Health Interview Survey, January- June 2012. Retrieved from

http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201212.pdf

Brannan, A. M., & Heflinger, C. A. (2006). Caregiver, child, family, and service system

contributors to caregiver strain in two child mental health service systems. *The Journal of

Behavioral Health Services & Research, 33*(4), 408-422.

Brannan, A. M., Heflinger, C. A., & Bickman, L. (1997). Caregiver strain questionnaire:

Measuring the impact on the family of living with a child with serious emotional disturbance.

Journal of Emotional and Behavioral Disorders, 5(4), 212-222. doi:

10.1177/106342669700500404

Brannan, A. M., Heflinger, C. A., & Foster, E. M. (2003). The role of caregiver strain and other family variables in determining children's use of mental health services. *Journal of Emotional and Behavioral Disorders, 11*(2), 77-91.

Brown, F. W. (1998). Rural telepsychiatry. *Psychiatric Services, 49*(7), 964.

Burke, R. V., Andersen, M. N., Bowen, S. L., Howard, M. R., & Allen, K. D. (2010). Evaluation of two instruction methods to increase employment options for young adults with autism spectrum disorder. *Research in Developmental Disabilities, 31*(6), 1223-1233. doi: 10.1016/j.ridd.2010.07.023

Burleson, J. A., & Kaminer, Y. (2007). Aftercare for adolescent alcohol use disorder: Feasibility and acceptability of a phone intervention. *The American Journal on Addictions, 16*, 202-205. doi: 10.1080/10550490701375251

Burnett-Zeigler, I., & Lyons, J. S. (2010). Caregiver factors predicting service utilization among youth participating in a school-based mental health intervention. *Journal for Child and Family Studies, 19*, 572-578. doi: 10.1007/s10826-009-9331-5

Burns, M., N., Begale, M., Duffecy, J., Gergle, D., Karr, C. J., Giangrande, E., & Mohr, D. C. (2011). Harnessing context sensing to develop a mobile intervention for depression. *Journal of Medical Internet Research, 13*(3), 158-174.

Burraston, B. O., Cherrington, D. J., & Bahr, S. J. (2010). Reducing juvenile recidivism with cognitive training and a cell phone follow-up: An evaluation of the RealVictory program. *International Journal of Offender Therapy and Comparative Criminology, 56*(1), 61-80. doi: 10.1177/0306624X10388635

Bussing, R., Zima, B. T., Gary, F. A., Mason, D. M., Leon, C. E., Sinha, K., & Garvan, C. W.

(2003). Social networks, caregiver strain, and utilization of mental health services among

    elementary school students at high risk for ADHD. *Journal of the American Academy of Child*

    and Adolescent Psychiatry, 42(7), 842-850. doi: 10.1097/01.CHI.0000046876.27264.BF

Buzza, C., Ono, S. S., Turvey, C., Wittrock, S., Noble, M., Reddy, G., . . .Reisinger, H. S.

    (2011). Distance is relative: Unpacking a principal barrier in rural healthcare. *Journal of*

    General Internal Medicine, 26(S2), 648-654.

California HealthCare Foundation. (2010). *How smartphones are changing health care for*

    consumers and providers. Oakland, CA: J. Sarasohn-Kahn.

Calloway, S. J. (2008). *Barriers to help-seeking for psychological distress among students*

    attending a small rural university. (Doctoral dissertation). Retrieved from ProQuest. (UMI

    3313381)

Carley-Baxter, L. R., Peytchev, A., & Black, M. C. (2010). Comparison of cell phone and

    landline surveys: A design perspective. *Field Methods, 22*(1), 3-15. doi:

    10.1177/1525822X09360310

Carlson, L. E., Lounsberry, J. J., Maciejewski, O., Wright, K., Collacutt, V., & Taenzer, P.

    (2012). Telehealth-delivered group smoking cessation for rural and urban participants:

    Feasibility and cessation rates. *Addictive Behaviors, 37*(1), 108-114.

Chavira, D. A., Garland, A., Yeh, M., McCabe, K., & Hough, R. L. (2009). Child anxiety

    disorders in public systems of care: Comorbidity and service utilization. *Journal of Behavioral*

    Health Services & Research, 36(4), 492-504.

Chen, J., Weiss, S., Heyman, M. B., Cooper, B., & Lustig, R. H. (2011). The efficacy of the

    web-based childhood obesity prevention program in Chinese American adolescents (web ABC

    study). *Journal of Adolescent Health, 49*(2), 148-154.

Chi, B. H., & Stringer, J. S. A. (2010). Mobile phones to improve HIV treatment adherence. *The*

Lancet, 376(9755), 1807-1808.

Chipp, C. L., Johnson, M. E., Brems, C., Warner, T. D., & Roberts, L. W. (2008). Adaptations to

    health care barriers as reported by rural and urban providers. *Journal of Health Care for the*

    Poor and Underserved, 19(2), 532-549.

Christensen, E. W., Anakwe, U. P., & Kessler, E. H. (2001). Receptivity to distance learning: The

    effect of technology, reputation, constraints, and learning preferences. *Journal of Research on*

    Computing in Education, 33(3), 263-279.

Chumbler, N. R., Cody, M., Booth, B. M., & Beck, C. K. (2001). Rural-urban differences in

    service use for memory-related problems in older adults. *The Journal of Behavioral Health*

    Services & Research, 28(2), 212-221.

Cohn, A. M., Hunter-Reel, D., Hagman, B. T., & Mitchell, J. (2011). Promoting behavior change

    from alcohol use through mobile technology: The future of ecological momentary assessment.

    Alcoholism: Clinical and Experimental Research, 35(12), 2209-2215. doi: 10.1111/j.1530-

    0277.2011.01571.x

Coker, T. R., Sareen, H. G., Chung, P. J., Kennedy, D. P., Weidmer, B. A., & Schuster, M. A.

    (2010). Improving access to and utilization of adolescent preventive health care: The

    perspectives of adolescents and parents. *Journal of Adolescent Health, 47*(2), 133-142.

Collie, K., Kreshka, M. A., Ferrier, S., Parsons, R., Graddy, K., Avram, S., . . .Koopman, C.

    (2007). Videoconferencing for delivery of breast cancer support groups to women living in

    rural communities: A pilot study. *Psycho-Oncology*, 16(8), 778-782.

Conrad, A. M., & Munro, D. (2008). Relationships between computer self-efficay, technology,

    attitudes and anxiety: Development of the computer technology use scale (CTUS). *Journal of*

    Educational Computing Research, 39(1), 51-73.

Correll, J. A., Cantrell, P. & Dalton, W. T. (2011). Integration of behavioral health services in a

primary care clinic serving rural Appalachia: Reflections on a clinical experience. *Families, Systems, & Health, 29*(4), 291-302. doi: 10.1037/a0026303

Corrigan, P. W., & Matthews, A. K. (2003). Stigma and disclosure: Implications for coming out of the closet. *Journal of Mental Health, 12*, 235-248.

Cox, C. M., Kenardy, J. A., & Hendrikz, J. K. (2010). A randomized controlled trial of a web-based early intervention for children and their parents following unintentional injury. *Journal of Pediatric Psychology, 35*(6), 581-592.

Cullen, R. (2001). Addressing the digital divide. *Online Information Review, 25*(5), 311-320.

Czaja, S. J., Charness, N., Dijkstra, K., Fisk, A. D., Rogers, W. A., & Sharit, J. (2006a). *Computer and technology experience questionnaire*. Center for Research and Education on Aging and Technology Enhancement.

Czaja, S. J., Charness, N., Fisk, A. D., Hertzog, C., Nair, S., Rogers, W., & Sharit, J. (2006b). Factors predicting the use of technology: Findings from the Center for Research and Education on Aging and Technology Enhancement (CREATE). *Psychology and Aging, 21*(2), 333-352.

De Leo, G., Brivio, E., & Sautter, S. W. (2011). Supporting autobiographical memory in patients with Alzheimer's disease using smart phones. *Applied Neuropsychology, 18*(1), 69-76.

Deen, T. L., Bridges, A. J., McGahan, T. C.,& Andrews III, A. R. (2012). Cognitive appraisals of specialty mental health services and their relation to mental health service utilization in the rural population. *The Journal of Rural Health, 28*, 142-151.

Dobscha, S. K., Corson, K., Solodky, J., & Gerrity, M. S. (2005). Use of videoconferencing for depression research: Enrollment, retention, and patient satisfaction. *Telemedicine and e-Health, 11*(1), 84-89.

Ehrenreich, B., Righter, B., Rocke, D. A., Dixon, L., & Himelhoch, S. (2011). Are mobile

phones and handheld computers being used to enhance delivery of psychiatric treatment?: A

systematic review. *The Journal of Nervous and Mental Disease, 199*(11), 886-891. doi:

10.1097/NMD.0b013e3182349e90

Elliott, T. R., Brossart, D., Berry, J. W., & Fine, P. R. (2008). Problem-solving training via

videoconferencing for family caregivers of persons with spinal cord injuries: A randomized

controlled trial. *Behavior Research and Therapy, 46,* 1220-1229. doi:

10.1016/j.brat.2008.08.004

Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends:" Social capital

and college students' use of online social network sites. *Journal of Computer-Mediated

Communication, 12*, 1143-1168. doi: 10.1111/j.1083-6101.2007.00367.x

Farmer, E. M. Z., Burns, B. J., Angold, A., & Costello, E. J. (1997). Impact of children's mental

health problems on families: Relationships with service use. *Journal of Emotional and

Behavioral Disorders, 5*(4), 230-238.

Finkelstein, S. M., Speedie, S. M., Zhou, X., Potthoff, S., & Ratner, E. R. (2011). Perception,

satisfaction and utilization of the VALUE home telehealth service. *Journal of Telemedicine

and Telecare, 17*, 288-292. doi: 10.1258/jtt.2011.100712

Fisher, J. D., Nadler, A., & Whitcher-Alagna, S. (1982). Recipient reactions to aid.

Psychological Bulletin, 91, 27-54.

Fjeldsoe, B. S., Marshall, A. L., & Miller, Y. D. (2009). Behavior change interventions delivered

by mobile telephone short-message service. *American Journal of Preventive Medicine, 36*(2),

165-173. doi: 10.1016/j.amepre.2008.09.040

Fortney, J. C., Owen, R., & Clothier, J. (1999). Impact of travel distance on the disposition of

patents presenting for emergency psychiatric care. *The Journal of Behavioral Health Services

& Research, 26*(1), 104-108.

Franklin, V. L., Waller, A., Pagliari, C., & Greene, S. A. (2006). A randomized controlled trial of

    Sweet Talk, a text messaging system to support young people with diabetes. *Diabetic*

    Medicine, 23, 1332-1338.

Freedman, M. J., Lester, K. M., McNamara, C., Milby, J. B., & Schumacher, J. E. (2006). Cell

    phones for ecological momentary assessment with cocaine-addicted homeless patients in

    treatment. *Journal of Substance Abuse Treatment, 30*(2), 105-111. doi:

    10.1016/j.jsat.2005.10.005

Frommer, D. (2010). Here's how to use Instagram. *Business Insider*. Retrieved from

    http://www.businessinsider.com/instagram-2010-11

Garland, A. F., Aarons, G. A., Brown, S. A., Wood, P. A., & Hough, R. L. (2003). Diagnostic

    profiles associated with use of mental health and substance abuse services among high-risk

    youths. *Psychiatric Services, 54*(4), 562-564.

Gerstberger, P. G., & Allen, T. J. (1968). Criteria used by research and development engineers in

    the selection of an information source. *Journal of Applied Psychology, 52*(4), 272-279.

Gibson, J. L., Pennington, R. C., Stenhoff, D. M., & Hopper, J. S. (2010). Using desktop

    videoconferencing to deliver interventions to a preschool student with autism. *Topics in Early*

    Childhood Special Education, 29, 214-225. doi: 10.1177/0271121409352873

Glueckauf, R. L, Fritz, S. P., Ecklund-Johnson, E. P., Liss, H. J., Dages, P., & Carney, P. (2002).

    Videoconferencing-based family counseling for rural teenagers with epilepsy: Phase findings.

    Rehabilitation Psychology, 47(1), 49-72. doi: 10.1037//0090-5550.47.1.49

Glueckauf, R. L., Stine, C., Bourgeois, M., Pomidor, A., Rom, P., Young, M. E., . . .Ashley, P.

    (2005). Alzheimer's rural care health line: Linking rural caregivers to cognitive-behavior

    intervention for depression. *Rehabilitation Psychology, 50*(4), 346-356.

Granholm, E., Ben-Zeev, D., Link, P. C., Bradshaw, K. R., & Holden, J. L. (2012). Mobile

assessment and treatment for schizophrenia (MATS): A pilot trial of an interactive text-

messaging intervention for medication adherence, socialization, and auditory hallucinations.

Schizophrenia Bulletin, 38(3), 414-425.

Green, A. C., Hunt, C., & Stain, H. J. (2012). The delay between symptom onset and

seeking professional treatment for anxiety and depressive disorders in a rural Australian

sample. *Social Psychiatry and Psychiatric Epidemiology, 47*(9), 1475-1487.

Grover, M., Naumann, U., Mohammad-Dar, L., Glennon, D., Ringwood, S., Eisler, I., . .

.Schmidt, U. (2011). A randomized controlled trail of an internet-based cognitive-behavioural

skills package for carers of people with anorexia nervosa. *Psychological Medicine: A Journal*

of Research in Psychiatry and the Allied Sciences, *41*(12), 2581-2591.

Gsell, M. R. (2010). Individual contributions to stigma and attitudes towards help-seeking among

rural emerging adult college students. (Doctoral dissertation). Retrieved from PsychINFO.

(UMI 3443864)

Gumpert, G., & Fish, S. L. (Eds.). (1990). *Talking to strangers: Mediated therapeutic communication.*

Norwood, NJ: Ablex.

Harley, J. (2006). Economic evaluation of a tertiary telepsychiatry service to an island. Journal of

Telemedicine and Telecare, 12, 354–357.

Hassija, C., & Gray, M. J. (2011). The effectiveness and feasibility of videoconferencing

technology to provide evidence-based treatment to rural domestic violence and sexual assault

populations. *Telemedicine and e-Health, 17*(4), 309-315.

Hauenstein, E. J., Petterson, S., Merwin, E., Rovnyak, V., Heise, B., & Wagner, D. (2006).

Rurality, gender, and mental health treatment. *Family Community Health, 29*(3), 169-185.

Hauenstein, E. J., Petterson, S., Rovnyak, V., Merwin, E., Heise, B., & Wagner, D. (2007).

Rurality and mental health treatment. *Administration and Policy in Mental Health and Mental Health Services Research, 34*(3), 255-267.

Hayes, S. C., Niccolls, R., Masuda, A., & Rye, A. K. (2002). Prejudice, terrorism, and behavior therapy. *Cognitive and Behavioral Practice, 9,* 296-301.

Heflinger, C. A., & Christens, B. (2006). Rural behavioral health services for children and adolescents: An ecological and community psychology analysis. *Journal of Community Psychology, 34*(4), 379-400. doi: 10.1002/jcop.20105

Hendryx, M. (2008). Mental health professional shortage areas in rural Appalachia. *The Journal of Rural Health, 24*(2), 179-182. doi: 10.1111/j.1748-0361.2008.00155.x

Hijazi, R. R. (2012). Exploring the use of smart phones to influence healthy behaviors [Abstract]. *Dissertation Abstracts International: Section B: The Sciences and Engineering, 72*(10-B), 5920.

Himle, J. A., Fischer, D. J., Muroff, J. R., Van Etten, M. L., Lokers, L. M., Abelson, J. L., & Hanna, G. L. (2006). Videoconferencing-based cognitive-behavioral therapy for obsessive-compulsive disorder. *Behaviour Research and Therapy*, *44*(12), 1821-1829.

Hoyt, D. R., Conger, R. D., Valde, J. G., & Weihs, K. (1997). Psychological distress and help seeking in rural America. *The American Psychologist, 46*(3), 232-239.

Hutton, H. E., Wilson, L. M., Apelberg, B. J., Tang, E. A., Odelola, O., Bass, E. B., & Chandler, G. (2011). A systematic review of randomized controlled trials: Web-based interventions for smoking cessation among adolescents, college students, and adults. *Nicotine and Tobacco Research, 13*(4), 227-238. doi: 10.1093/ntr/ntq252

Iezzoni, L. I., Killeen, M. B., & O'Day, B. L. (2006). Rural residents with disabilities confront substantial barriers to obtaining primary care. *Health Services Research, 41*(4, Part 1). 1258-1275.

Instagram. (2013). *Our story.* Retrieved from http://instagram.com/press/#

Jabaley, J. J., Lutzker, J. R., Whitaker, D. J., & Self-Brown, S. (2011). Using iPhones to enhance and reduce face-to-face home safety sessions within SafeCare®: An evidence-based child maltreatment prevention program. *Journal of Family Violence, 26,* 377-385. doi: 10.1007/s10896-011-9372-6

Jackson, C. M., Chow, S., & Leitch, R. A. (1997). Toward an understanding of the behavioral intention to use an information system. *Decision Sciences, 28*(2), 357-389.

Jellinek, M., Murphy, J. M., Burns, B. (1986). Brief psychosocial screening in outpatient pediatric practice. *Journal of Pediatrics*, *109*, 371-378.

Jellinek, M. S., Murphy, J. M., Little, M., Pagano, M. E., Comer, D. M., & Kelleher, K. J. (1999). Use of the pediatric symptom checklist to screen for psychosocial problems in pediatric primary care. *Archives of Pediatrics & Adolescent Medicine (153)*, 254-260.

Jellinek, M. S., Murphy, J. M., Robinson, J., Feins, A., Lamb, S., & Fenton, T. (1988). Pediatric symptom checklist: Screening school-age children for psychosocial dysfunction. *The Journal of Pediatrics, 112*(2), 201-209.

Jimenez, M. E., Manicone, P. E., Davies, J. L., & Stockwell, D. C. (2011). Assessing the impact of web based educational intervention on the patient handoff process among pediatric residents: A pre and post test evaluation. *International Journal of Child and Adolescent Health,4*(2), 175-181.

Jones, A. R., Cook, T. M., & Wang, J. (2011). Rural-urban differences in stigma against depression and agreement with health professionals about treatment. *Journal of Affective Disorders, 134*, 145-150. doi: 10.1016/j.jad.2011.05.013

Judd, F., Jackson, H., Komiti, A., Murray, G., Fraser, C., Grieve, A., & Gomez, R. (2006). Help-

seeking by rural residents for mental health problems: the importance of agrarian values. *Australian and New Zealand Journal of Psychiatry ,40*, 769-776.

Kagohara, D. M., Sigafoos, J., Achmadi, D., O'Reilly, M., & Lancioni, G. (2012). Teaching children with autism spectrum disorders to check the spelling of words. *Research in Autism Spectrum Disorders, 6*(1), 304-310. doi: 10.1016/j.rasd.2011.05.012

Kalichman, S. C., Kalichman, M. O., Cherry, C., Swetzes, C., Amaral, C. M., White, D., . . . Eaton, L. (2011). Brief behavioral self-regulation counseling for HIV treatment adherence delivered by cell phone: An initial test of concept trial. *AIDS Patient Care and STDs, 25*(5), 303-310. doi: 10.1089/apc.2010.0367

Katz, K. S., Rodan, M., Milligan, R., Tan, S., Courtney, L., Gantz, M., . . .Subramanian, S. (2011). Efficacy of a randomized cell phone-based counseling intervention in postponing subsequent pregnancy among teen mothers. *Maternal and Child Health Journal, 15*, S42-S53. doi: 10.1007/s10995-011-0860-3

Komiti, A., Judd, F., & Jackson, H. (2006). The influence of stigma and attitudes on seeking help from a GP for mental health problems: A rural context. *Social Psychiatry and Psychiatric Epidemiology, 41*(9), 738-745.

Lahman, M. K. E., D'amato, R. C., Stecker, S., & Mcgrain, E. (2006). Addressing the shortage of rural school psychologists via technology: Using candidate qualitative interviews to inform practice. *School Psychology International, 27*, 439-461. doi: 10.1177/0143034306070429

Larson, J. E., & Corrigan, P. W. (2010). Psychotherapy for self-stigma among rural clients. *Journal of Clinical Psychology: In Session, 66*(5), 524-536.

Lee, C. M., Neighbors, C., Kilmer, J. R., & Larimer, M. E. (2010). A brief web-based personalized feedback selective intervention for college student marijuana use: A randomized clinical trial. *Psychology of Addictive Behaviors, 24*(2), 265-273. doi: 10.1037/a0018859

Lee, W., Chae, W. M., Kim, S., Ho, S. H., & Choi, I. (2010). Evaluation of a mobile phone-based diet game for weight control. *Journal of Telemedicine and Telecare, 16*(5), 270-275.

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information and Management, 40*, 191-204.

Linn, A. J., Vervloet, M., van Dijk, L., Smit, E. G., & Van Weert, J. C. M. (2011). Effects of eHealth interventions on medication adherence: A systematic review of the literature. *Journal of Medical Internet Research, 13*(4), 203-217. doi: 10.2196/jmir.1738

Long, A. C., & Palermo, T. M. (2009). Brief report: Web-based management of adolescent chronic pain: Development and usability testing of an online family cognitive behavioral therapy program. *Journal of Pediatric Psychology, 34*(5), 511-516. doi: 10.1093/jpepsy/jsn082

Luxton, D. D., McCann, R. A., Bush, N. E., Mishkind, M. C., & Reger, G. M. (2011). mHealth for mental health: Integrating smartphone technology in behavioral healthcare. *Professional Psychology: Research and Practice, 42*(6), 505-512. doi: 10.1037/a0024485

Lyneham, H. J., & Rapee, R. M. (2007). Childhood anxiety in rural and urban areas: Presentation, impact and help seeking. *Australian Journal of Psychology, 59*(2), 108-118.

Markham, C. M., Shegog, R., Leonard, A. D., Bui, T. C., & Paul, M. E. (2009). +CLICK: Harnessing web-based training to reduce secondary transmission among HIV-positive youth. *AIDS Care, 21*(5), 622-631. doi: 10.1080/09540120802385637

Masuda, A., Price, M., Anderson, P. L., Schmertz, S. K., & Calamaras, M. R. (2009). The role of psychological flexibility in mental health stigma and psychological distress for the stigmatizer. *Journal of Social and Clinical Psychology, 28*(10), 1244-1262.

McCarthy, M., Muñoz, K., & White, K. R. (2010). Teleintervention for infants and young

children who are deaf or hard-of-hearing. *Pediatrics, 126*, S52-S58. doi: 10.1542/peds.2010-0354J

McConnochie, K. M., Wood, N. E., Herendeen, N. E., Ng, P. K., Noyes, K., Wang, H., & Roghmann, K. J. (2009). Acute illness care patterns change with use of telemedicine. *Pediatrics, 123*(6), e989-e995. doi: 10.1542/peds.2008-2698

Merikangas, K. R., He, J., Burstein, M., Swendsen, J., Avenevoli, S., Case, B., . . .Olfson, M. (2011). Service utilization for lifetime mental disorders in U.S. adolescents: Results of the National Comorbidity Survey-Adolescent Supplement (NCS-A). *Journal of the American Academy of Child & Adolescent Psychiatry, 50*(1), 32-45.

Merwin, E., Hinton, I., Dembling, B., & Stern, S. (2003). Shortages of rural mental health professionals. *Archives of Psychiatric Nursing, 17*(1), 42-51.

Militello, L. K., Kelly, S. A., & Melnyk, B. M. (2012). Systematic review of text-messaging interventions to promote healthy behaviors in pediatric and adolescent populations: Implications for clinical practice and research. *Worldviews on Evidence-Based Nursing, 9*(2), 66-76. doi: 10.1111/j.1741-6787.2011.00239.x

Mohr, D. C. (2009). Telemental health: Reflections on how to move the field forward. *Clinical Psychology: Science and Practice, 16,* 343-347.

Mojtabai, R., Olfson, M., Sampson, N. A., Jin, R., Druss, B., Wang, P. S., . . . Kessler, R. C. (2011). Barriers to mental health treatment: Results from the National Comorbidity Survey Replication. *Psychological Medicine, 41*(8), 1751-1761.

Moore, B. A., & O'Donohue, W. T. (2011). Evaluating a web-based cognitive behavioral intervention for the prevention and treatment of pediatric obesity. In W. T. O'Dononue & C. Draper (Eds.), *Stepped care and e-health: Practical applications to behavioral disorders* (pp. 137-149). New York, NY: Springer Science + Business Media.

Morgan, D. G., Crossley, M., Kirk, A., McBain, L., Stewart, N. J., D'Arcy, C., . . . Dal

    Basran, J. (2011). Evaluation of telehealth for preclinic assessment and follow-up in an

    interprofessional rural and remote memory clinic. *Journal of Applied Gerontology, 30*(3), 304-

    331.

Morris, M. G., & Venkatesh, V. (2000). Age differences in technology adoption decisions:

    Implications for a changing work force. *Personnel Psychology, 53*(2), 375-403.

Mulvaney, S. A., Rothman, R. L., Dietrich, M. S., Wallston, K. A., Grove, E., Elasy, T. A., &

    Johnson, K. B. (2012). Using mobile phones to measure adolescent diabetes adherence. *Health*

    Psychology, 31(1), 43-50. doi: 10.1037/a0025543

Murphy, J. M., Ichinose, C., Hicks, R., Kingdon, D., Crist-Whitzel, J., Jordan, P., . . .Jellinek, M.

    S. (1996). Utility of the pediatric symptom checklist as a psychological screen to meet the

    federal early and periodic screening, diagnosis, and treatment (EPSDT) standards: A pilot

    study. *The Journal of Pediatrics, 129*(6), 864-869. doi: 10.1016/S0022-3476(96)70030-6

Murry, V. M., Heflinger, C. A., Suiter, S. V., & Brody, G. H. (2011). Examining perceptions

    about mental health care and help-seeking among rural African American families of

    adolescents. *Journal of Youth and Adolescence, 40*(9), 1118-1131.

Nelson, E., Bardnard, M., & Cain, S. (2003). Treating childhood depression over

    videoconferencing. *Telemedicine Journal and e-Health, 9*(1), 49-55.

Newton, K. H., Wilthshire, E. J., & Elley, C. R. (2009). Pedometers and text messaging to

    increase physical activity. *Diabetes Care, 32*(5), 813-815.

Nilsson, M., Rasmark, U., Nordgren, H., Hallberg, P., Skönevik, J., Westman, G., & Rolandsson,

    O. (2009). The physician at a distance: The use of videoconferencing in the treatment of

    patients with hypertension. *Journal of Telemedicine and Telecare*, *15*(8), 397-403.

Noblin, A., Cortelyou-Ward, K., & Cantiello, J. (2012). Utilizing telemedicine techniques to

confront rural mental health care challenges: The progressions towards a technological health ecosystem. *Journal of Health & Medical Informatics, S7*. doi:10.4172/2157-7420.S7-001

Obermayer, J. L., Riley, W. T., Asif, O., & Jean-Mary, J. (2004). College smoking-cessation using cell phone text messaging. *Journal of American College Health, 53*(2), 71-78.

Oldenburg, B., & Glanz, K. (2008). Diffusion of innovations. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior and health education: Theory, research, and practice* (pp. 313-333). San Francisco, CA: Jossey-Bass.

O'Reilly, C. A. (1982). Variations in decision makers' use of information sources: The impact of quality and accessibility of information. *Academy of Management Journal, 25*(4), 756-771.

Pemberton, M. R., Williams, J., Herman-Stahl, M., Calvin, S. L., Bradshaw, M. R., Bray, R. M., . . . Mitchell, G. M. (2011). Evaluation of two web-based alcohol interventions in the U.S. military. *Journal of Studies on Alcohol and Drugs, 72*(3), 480-489. doi:

Panero, J. C., Lane, D. M., & Napier, H. A. (1997). The computer use scale: Four dimensions of how people use computers. *Journal of Educational Computing Research, 16*(4), 297-315.

Pepper, C. M., Thompson, V. M., & Nieuwsma, J. A. (2008). Providers' perceptions of barriers to the treatment of emotional disorders in non-urban primary care clinics. *Primary Care & Community Psychiatry, 13*(2), 59-65.

Perle, J. G., Langsam, L. C., & Nierenberg, B. (2011). Controversy clarified: An updated review of clinical psychology and tele-health. *Clinical Psychology Review, 31*(8), 1247-1258. doi: 10.1016/j.cpr.2011.08.003

Pescosolido, B. A., Fettes, D. L, Martin, J. K., Monahan, J., & McLeod, J. D. (2007). Perceived dangerousness of children with mental health problems and support for coerced treatment. *Psychiatric Services, 58*, 619-625.

Pescosolido, B. A., Jensen, P. S., Martin, J. K., Perry, B. L., Olafsdottir, S., & Fettes, D. (2008).

Public knowledge and assessment of child mental health problems: Findings from the National

Stigma Study-Children. *Journal of the American Academy of Child and Adolescent Psychiatry,*

47(3), 339-349.

Pew Internet and American Life Project. (2013). Trend data (adults): Device ownership

over time. Retrieved from http://www.pewinternet.org/Static-Pages/Trend-Data-

(Adults)/Device-Ownership.aspx

Pew Internet and American Life Project. (2012). Trend data (adults): Home broadband adoption.

Retrieved from http://www.pewinternet.org/Trend-Data-(Adults)/Home-Broadband-

Adoption.aspx

Pew Research Center. (2009). *The social life of health information*. Washington, DC: Susannah Fox

and Sydney Jones.

Pew Research Center. (2010). *Mobile access 2010*. Washington, DC: Aaron Smith.

Pew Research Center. (2011a). *Americans and text messaging*. Washington, DC: Aaron Smith.

Pew Research Center. (2011b). *Americans and their cell phones*. Washington, DC: Aaron Smith.

Pew Research Center. (2012). *Digital differences*. Washington, DC: Kathryn Zickuhr and Aaron

Smith.

Pew Research Center. (2013). *Health online 2013*. Washington, DC: Susannah Fox and Maeve

Duggan.

Polaha, J., Volkmer, A., & Valleley, R. J. (2007). A call-in service to address parent concerns

about child behavior in rural primary care. *Families, Systems, & Health, 25*(3), 333-343.

Polaha, J., & Williams, S. L. (manuscript in preparation). The perceived stigma of mental health

services among rural parents.

Poon, P., Hui, E., Dai, D., Kwok, T., & Woo, J. (2005). Cognitive intervention for community-

dwelling older persons with memory problems: Telemedicine versus face-to-face treatment. *International Journal of Geriatric Psychology, 20*, 285-286.

Pullman, M. D., VanHooser, S., Hoffman, C., & Heflinger, C. A. (2010). Barriers to and supports of family participation in a rural system of care for children with serious emotional problems. *Community Mental Health Journal, 46*(3), 211-220.

Reif, S., Golin, C. E., & Smith, S. R. (2005). Barriers to accessing HIV/AIDS care in North Carolina: Rural and urban differences. *AIDS Care, 17*(5), 558-565.

Rice, R. E., & Shook, D. E. (1988). Access to, usage of, and outcomes from an electronic messaging system. *ACM Transactions on Office Information Systems, 6*(3), 255-276.

Richardson, L. K., Frueh, B. C., Grubaugh, A. L., Egede, L., & Elhai, J. D. (2009). Current directions in videoconferencing tele-mental health research. *Clinical Psychology: Science and Practice, 16,* 323-338.

Rizvi, S. L., Dimeff, L. A., Skutch, J. C., Carroll, D., & Linehan, M. M. (2011). A pilot study of the DBT coach: An interactive mobile phone application for individuals with borderline personality disorder and substance use disorder. *Behavior Therapy, 42*(4), 589-600.

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York, NY: Free Press.

Sander, A. M., Clark, A. N., Atchison, T. B., & Rueda, M. (2009). A web-based videoconferencing approach to training caregivers in rural areas to compensate for problems related to traumatic brain injury. *The Journal of Head Trauma Rehabilitation, 24*(4), 248-261.

Sarnquist, C. C., Soni, S., Hwang, H., Topol, B. B., Mutima, S., & Maldonado, Y. A. (2011). Rural HIV-infected women's access to medical care: Ongoing needs in California. *AIDS Care, 23*(7), 792-796.

Sato, A. F., Clifford, L. M., Silverman, A. H., & Davies, W. H. (2009). Cognitive-behavioral

interventions via telehealth: Applications to pediatric functional abdominal pain. *Children's*

Health Care, 38, 1-22. doi: 10.1080/02739610802615724

Schroeder, C. S. (1996). Psychologists and pediatricians in collaborative practice. In R. J.

Resnick & R. H. Rozensky (Eds.), *Health Psychology Through the Life Span: Practice and*

Research Opportunities (pp. 109-131). American Psychological Association.

Shaikh, U., Nettiksimmons, J., & Romano, P. (2011). Pediatric obesity management in rural

clinics in California and the role of telehealth in distance education. *The Journal of Rural*

Health, 27(3), 263-269.

Shapiro, J. R., Bauer, S., Hamer, R. M., Kordy, H., Ward, D., & Bulik, C. M. (2008). Use of text

messaging for monitoring sugar-sweetened beverages, physical activity, and screen time in

children: A pilot study. *Journal of Nutrition Education and Behavior, 40*(6), 385-391. doi:

10.1016/j.jneb.2007.09.014

Shore, J. H., Brooks, E., Savin, D. M., Manson, S. M., & Libby, A. M. (2007). An economic

evaluation of telehealth data collection with rural populations. *Psychiatric Services, 58*(6), 830-

835.

Simpson, S. (2001). The provision of a telepsychology service to Shetland: Client and therapist

satisfaction and the ability to develop a therapeutic alliance. *Journal of Telemedicine and*

Telecare, 7(S1), 34-36.

Skinner, A. C., & Slifkin, R. T. (2007). Rural/urban differences in barriers to and burden of care

for children with special health care needs. *The Journal of Rural Health, 23*(2), 150-157.

Srebnik, D., Cauce, A. M., & Baydar, N. (1996). Help-seeking pathways for children and adolescents.

Journal of Emotional and Behavioral Disorders, 4(4), 210-220.

Swendeman, D., & Rotheram-Borus, M. J. (2010). Innovation in sexually transmitted disease

and HIV prevention: Internet and mobile phone delivery vehicles for global diffusion. *Current Opinion in Psychiatry, 23*(2), 139-144.

Swinton, J. J., Robinson, W. D., & Bischoff, R. J. (2009). Telehealth and rural depression: Physician and patient perspectives. *Families, Systems, & Health, 27*(2), 172-182. Doi: 10.1037/a0016014

Tenkku, L. E., Mengel, M. B., Nicholson, R. A., Hile, M. G., Morris, D. S., & Salas, J. (2011). A web-based intervention to reduce alcohol-exposed pregnancies in the community. *Health Education & Behavior,38*(6), 563-573. doi: 10.1177/1090198110385773

Thompson, R., & May, M. A. (2006). Caregivers' perceptions of child mental health needs and service utilization: An urban 8-year old sample. *The Journal of Behavioral Health Services & Research, 33*(4), 474-482.

Thornicroft, G. (2008). Stigma and discrimination limit access to mental health care. *Epidemiologia e Psichiatria Sociale, 17*(1), 14-19.

Thurston, I. B. (2010). *Help-seeking and utilization patterns among African American and Caucasian mothers and fathers: An examination of parental problem recognition, barriers, and beliefs*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (UMI No. 34225651)

U.S. Census Bureau. (2012). Current population survey. Retrieved from http://www.census.gov/cps/

U. S. Census Bureau. (2013). *State & county quickfacts.* Retrieved from http://quickfacts.census.gov/qfd/index.html

United States Department of Agriculture(2012). Rural-Urban Continuum Codes. Retrieved from http://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx

United States Department of Agriculture. (2003). *2003 Rural-Urban Continuum Codes* [Data

file]. Retrieved from http://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx

U.S. Department of Commerce. (2011). *Exploring the digital nation: Computer and internet use at home.* Retrieved from http://www.ntia.doc.gov/files/ntia/publications/exploring_the_ digital_ nation_computer_and_internet_use_at_home_11092011.pdf

Verhoeven, F., van Gemert-Pijnen, L., Dijkstra, K., Nijland, N., Seydel, E., & Steehouder, M. (2007). The contribution of teleconsultation and videoconferencing to diabetes care: A systematic literature review. *Journal of Medical Internet Research, 9*(5), 45-69.

Vidrine, D. J., Arduino, R. C., & Gritz, E. R. (2006). Impact of a cell phone intervention on mediating mechanisms of smoking cessation in individuals living with HIV/AIDS. *Society for Research on Nicotine and Tobacco, 8*(1), S103-S108. doi: 10.1080/14622200601039451

Vogel, D. L., Wade, N. G., & Haake, S. (2006). Measuring the self-stigma associated with seeking psychological help. *Journal of Counseling Psychology, 53*(3), 325-337. doi: 10.1037/0022-0167.53.3.325

Wade, S. L., Walz, N. C., Carey, J. C., & Williams, K. M. (2008). Preliminary efficacy of a web-based family problem-solving treatment program for adolescents with traumatic brain injury. *The Journal of Head Trauma Rehabilitation, 23*(6), 369-377.

Wei, J., Hollin, I., & Kachnowski, S. (2011). A review of the use of mobile phone text messaging in clinical and healthy behaviour interventions. *Journal of Telemedicine and Telecare, 17*, 41-48. doi: 10.1258/jtt.2010.100322

Weis, K. E., Liese, A. D., Hussey, J., Gibson, J. J., & Duffus, W. A. (2010). Associations of rural residents with timing of HIV diagnosis and state of disease at diagnosis, South Carolina 2001-2005. *The Journal of Rural Health, 26*(2), 105-112.

Weiss, J., & Lunsky, Y. (2010). Service utilization patterns in parents of youth and adults with

intellectual disability who experienced behavioral crisis. *Journal of Mental Health Research in Intellectual Disabilities, 3*(3), 145-163.

Wendell, M. L., Brossart, D. F., Elliott, T. R., McCord, C., & Diaz, M. A. (2011). Use of technology to increase access to mental health services in a rural Texas community. *Family and Community Health, 34*(2), 134-140.

Whittaker, R., Borland, R., Bullen, C., Lin, R. B., McRobbie, H., & Rodgers, A. (2009). Mobile phone-based interventions for smoking cessation. *Cochrane Database of Systematic Reviews, 4:*CD006611. doi: 10.1002/14651858.CD006611.pub2.

Williams, S. L., & Polaha, J. (under review). Measuring rural parents' perceived stigma of seeking mental health services for their children. Revise and resubmit.

Wolfenden, L., Brennan, L., & Britton, B. I. (2010). Intelligent obesity interventions using smartphones. *Preventive Medicine: An International Journal Devoted to Practice and Theory, 51*(6), 519-520.

Wu, P., Hoven, C. W., Bird, H. R., Moore, R. E., Cohen, P., Alegria, M., . . . Roper, M. T. (1999). Depressive and disruptive disorders and mental health service utilization in children and adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry, 38*(9), 1081-1090.

Zilliacus, E. M., Meiser, B., Lobb, E. A., Kirk, J., Warwick, L., & Tucker, K. (2010). Women's experience of telehealth cancer genetic counseling. *Journal of Genetic Counseling, 19*(5), 463-472. doi: 10.1007/s10897-010-9301-5.

Zwaanswijk, M., Verhaak, P. F. M., Bensing, J. M., van der Ende, J., & Verhulst, F. C. (2003). Help seeking for emotional and behavioural problems in children and adolescents. *European Child & Adolescent Psychiatry, 12*, 153-161. doi: 10.1007/s00787-003-0322-6

APPENDIXES

Appendix A

Demographics

Please answer these questions about the child you brought to the clinic today.

Child's Age: _____   Child's Date of Birth:_____   Child Sex: ___Male
                                                                                                    ___ Female
Your relationship to the child:
_____Mother
_____Father
_____Other: (specify) _____

What county do you live in? _____ Zip Code: _____

Which of the following racial/ethnic groups best describes you? (please check one box)

    □ White (Caucasian)   □ White Hispanic   □ Black (African American)
    □ Black Hispanic   □ Asian/Pacific Islander □ Native American
    □ Other (Please specify): _____

Father/Step-father's highest grade completed:	Mother/Step-mother's highest grade completed:
_____ does not apply	_____ does not apply
_____ did not complete high school	_____ did not complete high school
_____ high school	_____ high school
_____ 2-year college or technical school	_____ 2-year college or technical school
_____ 4-year college	_____ 4-year college
_____ post college degree	_____ post college degree

Have you ever talked about concerns you have for your child or other members of your family with any of the following people? Check all that apply.

For my child:	**For another member of our family:**
____his or her teacher	____a teacher
____our pastor or minister at church	____our pastor or minister at church
____close family members or friends	____close family members or friends
____his or her doctor	____his or her doctor
____a counselor or therapist	____a counselor or therapist
_____other: _____	_____other: _____

How would you rate your child's health TODAY? (circle one)
     Poor   *Fair*   *Good*   *Very Good*   *Excellent*

How would you rate your child's health OVERALL? (circle one)
     Poor   *Fair*   *Good*   *Very Good*   *Excellent*

Appendix B

Pediatric Symptom Checklist

Please place a mark under the heading that best describes **the child you have brought to the clinic today**.

		Never	**Sometimes**	**Often**
1.	Complains of aches and pains			
2.	Spends more time alone			
3.	Tires easily, has little energy			
4.	Fidgety, unable to sit still			
5.	Has trouble with teacher			
6.	Less interested in school			
7.	Acts as if driven by motor			
8.	Daydreams too much			
9.	Distracted easily			
10.	Is afraid of new situations			
11.	Feels sad, unhappy			
12.	Is irritable, angry			
13.	Feels hopeless			
14.	Has trouble concentrating			
15.	Less interested in friends			
16.	Fights with other children			
17.	Absent from school			
18.	School grades dropping			
19.	Is down on him or herself			
20.	Visits the doctor with doctor finding nothing wrong			
21.	Has trouble sleeping			
22.	Worries a lot			
23.	Wants to be with you more than before			
24.	Feels he or she is bad			
25.	Takes unnecessary risks			
26.	Gets hurt frequently			
27.	Seems to be having less fun			
28.	Acts younger than children his or her age			
29.	Does not listen to rules			
30.	Does not show feelings			
31.	Does not understand other people's feelings			
32.	Teases others			
33.	Blames others for his or her troubles			
34.	Takes things that don't belong to him or her			
35.	Refuses to share			

Appendix C
Choices for Getting Help (1)

We are interested in learning about how you would get help for your child's problems with behavior or emotions. Please answer the following questions about you and your child.

1. **Some parents who are concerned about their child's behavior or emotions talk about that concern with their child's teacher or another member of the school staff such as a guidance counselor or principal.**
   How likely would you be to talk with a teacher or school staff in the future?

   Not at all   Probably not   Probably would   Definitely would

2. **Some parents who are concerned about their child's behavior or emotions talk about that concern with their pastor or the minister at their church.**
   How likely would you be to talk with a pastor or minister in the future?

   Not at all   Probably not   Probably would   Definitely would

3. **Some parents who are concerned about their child's behavior or emotions talk about that concern with close family members or friends.**
   How likely would you be to talk with family members or friends in the future?

   Not at all   Probably not   Probably would   Definitely would

4. **Some parents who are concerned about their child's behavior or emotions talk about that concern with their child's doctor.**
   How likely would you be to talk with your child's doctor in the future?

   Not at all   Probably not   Probably would   Definitely would

5. **Some parents who are concerned about their child's behavior or emotions talk about that concern with a counselor, therapist, or psychologist.**
   How likely would you be to talk with a counselor, therapist, or psychologist?

   Not at all   Probably not   Probably would   Definitely would

Choices for Getting Help (2)

Counselors, therapists, and psychologists work with families in many different settings. Please indicate which settings you have seen or would see a counselor, therapist, or psychologist.

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1.I would take my child to see a counselor, therapist, or psychologist working in my child's school.	1	2	3	4	5	6
2.I would take my child to see a counselor, therapist, or psychologist working in my church	1	2	3	4	5	6
3.I would take my child to see a counselor, therapist, or psychologist working in my child's doctor's office	1	2	3	4	5	6
4.I would take my child to see a counselor, therapist, or psychologist in a private office building where they had their own business.	1	2	3	4	5	6
5.I would take my child to see a counselor, therapist, or psychologist in a center that is designated to provide mental/behavioral health services.	1	2	3	4	5	6
6.I would take my child to my local hospital to a room with special equipment that would allow me to meet with a counselor, therapist, or psychologist over the television in two-way videoconferencing.	1	2	3	4	5	6

Parents' Perceived Stigma of Service Seeking

Seeking Help for My Child

Instructions: *If you took your child to a counselor, therapist, or psychologist for problems with his or her behaviors or emotions, how would you feel? The following questions ask about the things you might do, think, or feel. These feelings are natural and experienced by many individuals. Please tell us how much you agree or disagree with each one.*

If I took my child to see a counselor, therapist, or psychologist for problems with his or her behaviors or emotions:

		Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1	it would make me feel strange.	1	2	3	4	5	6
2	it would make me feel embarrassed.	1	2	3	4	5	6
3	it would make me feel like a bad parent.	1	2	3	4	5	6
4	my view of myself would be less.	1	2	3	4	5	6
5	it would make me feel that I am weak.	1	2	3	4	5	6
6	it would make me feel like there is something wrong with me.	1	2	3	4	5	6
7	it would make me feel like there is something wrong with my child.	1	2	3	4	5	6
8	some people might treat me unfairly.	1	2	3	4	5	6
9	some people might look down on me.	1	2	3	4	5	6
10	some people might say bad things about me behind my back.	1	2	3	4	5	6
11	some people would treat me with less respect	1	2	3	4	5	6
12	some people would avoid me.	1	2	3	4	5	6

If I took my child to see a counselor, therapist, or psychologist for problems with his or her behaviors or emotions:

		Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
13	my child might be labeled at school.	1	2	3	4	5	6
14	people in my church might frown on my decision.	1	2	3	4	5	6
15	my child's teacher would treat him or her unfairly.	1	2	3	4	5	6
16	I would be worried that people in town would find out.	1	2	3	4	5	6
17	I would try to hide that I was getting counseling for my child.	1	2	3	4	5	6
18	I would try to go to a counselor in another town so no one I know would find out.	1	2	3	4	5	6

Appendix E

Barriers to Getting Help for My Child

Sometimes parents want to get help for their child but have difficulty doing so. If you decided you wanted to get help from a counselor, therapist, or psychologist for your child's behavior or emotions, which of these difficulties might you have? **Check all that apply.**

____1. There would not be space available for my child or there would be long waiting lists to get help from a counselor, therapist, or psychologist in my area.

____2. I would be afraid of what my family or friends would think.

____3. My son or daughter would refuse to go to a counselor, therapist, or psychologist.

____4. The counselors, therapists, and/or psychologists might refuse to provide the help or services for my child's problems.

____5. I do not have the money to pay for a counselor, therapist, or psychologist. .

____6. My insurance company would not pay for it.

____7. I would think my child's problems are not so serious or I could handle them on my own.

____8. I would be afraid my child might be labeled as a problem child by the system (people like a teacher, doctor, or juvenile court) if s/he went to a counselor, therapist, or psychologist.

____9. I don't have a way to get to a counselor, therapist or psychologist or money to pay for the gas.

____10. There are no counselors, therapists, or psychologists in my area.

____11. The available appointment times would not be convenient.

____12. I would not think that treatment with a counselor, therapist, or psychologist would help.

____13.I wouldn't know where to go to find a counselor, therapist, or psychologist.

Appendix F

Caregiver Concerns

Please look back over the <u>past six months</u> and try to remember how things have been for your family. We are trying to get a picture of how life has been in your household over that time. In the past 6 months, how much of a problem were the following:

	Not at all	A little	Some- what	Quite a bit	Very much
1. Interruption of personal time resulting from your child's problems?	1	2	3	4	5
2. Your missing work or neglecting other duties because of your child's problems?	1	2	3	4	5
3. Disruption of family routines due to your child's problems?	1	2	3	4	5
4. Any family member having to do without things because of your child's problems?	1	2	3	4	5
5. Any family member suffering negative mental or physical health effects as a result of your child's problems?	1	2	3	4	5
6. Your child getting into trouble with the neighbors, the community, or law enforcement?	1	2	3	4	5
7. Financial strain for your family as a result of your child's problems?	1	2	3	4	5
8. Less attention paid to any family member because of the attention given to your child?	1	2	3	4	5
9. Disruption or upset of relationships within the family due to your child's problems?	1	2	3	4	5
10. Disruption of your family's social activities resulting from your child's problems?	1	2	3	4	5

In the past 6 months:

	Not at all	A little	Some-What	Quite a bit	Very much
11. How socially isolated did you feel as a result of your child's problems?	1	2	3	4	5
12. How sad or unhappy did you feel as a result of your child's problems?	1	2	3	4	5
13. How embarrassed did you feel about your child's problems?	1	2	3	4	5
14. How well did you relate to your child?	1	2	3	4	5
15. How angry did you feel toward your child?	1	2	3	4	5
16. How worried did you feel about your child's future?	1	2	3	4	5
17. How worried did you feel about your family's future?	1	2	3	4	5
18. How guilty did you feel about your child's problems?	1	2	3	4	5
19. How resentful did you feel toward your child?	1	2	3	4	5
20. How tired or strained did you feel as a result of your child's problems?	1	2	3	4	5
21. In general, how much of a toll has your child's problems been on your family?	1	2	3	4	5

Appendix G

Use of Technology

1. Which of the following electronic devices do you own? Check all that apply.

   □ Desktop Computer   □ Laptop Computer
   □ Telephone (land line)   □ Prepaid Cell Phone
   □ Cell Phone with annual contract   □ iPod/MP3 Player
   □ Digital Camera (not on cell/smart phone)   □ iPad/Kindle or other e-reader
   □ Smart Phone (combination cell phone and internet device)

2. Please check how often you use the following:

	3 or more times per day	1-2 times per day	1-2 times per week	Less than once per week	Never
Telephone (land line in house)					
Cell phone (phone calls only)					
Cell phone (internet use only)					
Cell phone (app use only)					
Texting					
E-mail					
Social Networking (e.g. Facebook)					
Instant Messaging/Chat					
Skype/FaceTime					

3. How many social networks do you belong to? (i.e. Facebook, Twitter, MySpace)

   0   1   2   3   4+

4. How many hours each day do you normally spend on PERSONAL activities using an electronic device (cell phone, computer, palm device, etc.)?

   □None   □Less than 1   □1-2   □3-5   □6-10   □11+

5. How many hours each day do you normally spend on WORK-RELATED activities using an electronic device (cell phone, computer, palm device, etc.)?

   □I Do Not Work   □None   □Less than 1   □1-2   □3-5   □6-10   □11+

6. Which of the following do you have in your home?

   □Dial-Up Internet (runs through phone line) □DSL/Cable/High-Speed Internet (runs through a cable)
   □I do not have internet in my home
   If you do not have internet in your home, where do you go to access the internet?
   _____

7. How many hours each day do you normally spend using the Internet?

   □None   □Less than 1   □1-2   □3-5   □6-10   □11+

VITA

COURTNEY ELIZABETH LILLY

Personal Data:	Date of Birth: February 17, 1989 Place of Birth: Johnson City, Tennessee Marital Status: Single

Education:	M. A. Psychology, East Tennessee State University, Johnson City,
	      Tennessee, 2013
	B. S. Sociology, East Tennessee State University, Johnson City,
	      Tennessee, 2011
	Public Schools, Johnson City, Tennessee

Professional Experience:	Graduate Student Clinician, Mountain City Extended Hours Health
	      Center, 2013-present
	Graduate Student Clinician, East Tennessee State University
	      Behavioral Health and Wellness Clinic, 2013-present
	Graduate Assistant, East Tennessee State University,
	      College of Arts and Sciences, 2011-present

Publications:	Polaha, J., Tolliver, R. M., **Lilly, C. E.**, & Rowe, C. (2012, November 8). CFHA annual conference: What's in it for students? [Collaborative Family Healthcare Association Blog Post]. Retrieved from http://www.cfha.net/ blogpost/689173/CFHA-Blog
Presentations:	**Lilly, C.,** & Polaha, J. (2013, November). Technology use in rural Appalachia: A pilot study of the implications for pediatric behavioral health. Poster accepted for presentation at the Association for Behavioral and Cognitive Therapies: Technology and Behavior Change Special Interest Group, Nashville, TN. McCarter, K., Petgrave, D., **Lilly, C.**, Gouge, N., & Polaha, J. (2013, April). The cost effectiveness of behavioral health consultant utilization of Attention Deficit Hyperactivity Disorder cases in rural pediatric primary care. Poster presented at the Appalachian Student Research Forum, Johnson City, TN. Petgrave, D., McCarter, K., **Lilly, C.**, Gouge, N., & Polaha, J. (2013, April). Managing multiple concerns in pediatric primary care: The impact of behavioral health concerns on time. Poster presented at the Appalachian Student Research Forum, Johnson City, TN. **Lilly, C. E.**, Polaha, J., Williams, S., & Schrift, M. (2013, March). Rural parents' perspectives on mental health services: A qualitative study. Paper presented at the Collaborative Conference on Rural Mental Health Training, Boone, NC.

Lilly, C. (2012, April). Applying to graduate school. Presented at Dr. Jon Webb's workgroup meeting, Johnson City, TN.

Bumgarner, D., Jeter, B. R., Pearson, C., **Lilly, C.**, Brewer, K. G., & Webb, J. R. (2012, March). Forgiveness and psychological distress among college student non-problematic drinkers: Health behavior, social support, and interpersonal functioning as mediators. Component of a Symposium presentation (Jon R. Webb (Chair): Mediators of the association between forgiveness and health) at the 10th Annual Mid–Year Research Conference on Religion and Spirituality, Division 36 – Society for the Psychology of Religion and Spirituality, of the APA: Columbia, Maryland.

Tolliver, R. M., **Lilly, C.**, Reed, S., Williams, S., & Polaha, J. (2012, April). Primary care: An opportunity to address behavioral health among rural children. Paper presented at the Collaborative Conference on Rural Mental Health Training, Boone, NC.

Tolliver, R. M., **Lilly, C.**,Reed, S., Williams, S., & Polaha, J. (2012, February). Primary care: An opportunity to address behavioral health among rural children. Paper presented at the Primary Care and Prevention Research Day, Johnson City, TN.

Hill, S. K., **Lilly, C. E.**, Brewer, K. G., & Webb, J. R. (November 4, 2011). Dimensions of social support as mediators of the association between religiousness and aggression. Poster presented at the Tennessee Psychological Association, Nashville, TN.

Honors and Awards:

Undergraduate Poster Session. Society, Behavior, and Learning Subgroup, Group B, *First Place*, 2013. Appalachian Student Research Forum.

Graduate Poster Session. Society, Behavior, and Learning Subgroup, *Second Place*, 2013. Appalachian Student Research Forum.

Graduate Poster Session, *Third Place*, 2011. Tennessee Psychological Association.

Magna Cum Laude Honors, 2011. East Tennessee State University.

Outstanding Sociology Student, 2011. East Tennessee State University.

Academic Performance Scholarship, 2008-2011. East Tennessee State University.

Barbara James Service Award, 2005. Health Occupation Students of America.