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Thesis

TELEPSYCHIATRY

by

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TELEPSYCHIATRY
MEGAN MACLEOD

ABSTRACT

Mental illness affects 18% of American adults and 8.0% of American children. Untreated mental illness can increase mortality, influence treatment of other conditions, and impose unnecessary burdens on individuals, families, and communities. Despite the prevalence and burdens of untreated mental illness, there are still numerous financial, social, and organizational barriers to the availability, utilization and quality of mental health services. In the last two decades, many efforts have been made to improve healthcare access through legal and regulatory overhauls, health insurance reform, electronic health system infrastructure expansion, and development of new models of care. These efforts are perhaps most easily observed through the implementation of telehealth and telemedicine. Telehealth is an umbrella term indicating the use of technology for the provision of healthcare, health administration, and health education while telemedicine is a more specific term referring to the use of technology for the delivery of healthcare across distances. While telemedicine is used in almost all subspecialties, implementation and research are more developed in some specialties than in others. Research on telepsychiatry shows that 1) telepsychiatry can be used to effectively diagnose and treat a variety of mental illnesses in a number of populations in many locations; 2) telepsychiatry has the potential to be a cost effective alternative to treatment as usual for patients, providers, and communities; 3) telemental health can function successfully within the legal and regulatory landscape in United States; 4) the
technology for telemental health is already available and continually improving; 5) There are resources available to facilitate the use of telemental health by patients, providers and healthcare organizations.

Telepsychiatry has the potential to improve access to mental health services by connecting patients with the right providers, reducing the costs of receiving and providing mental healthcare, lowering social barriers that prevent individuals from seeking and providers from offering care, and facilitating organizational practices and goals. This paper summarizes published data concerning the clinical, financial, legal and regulatory, and technological aspects of telepsychiatry and explores how telepsychiatry might be used to improve the availability, utilization, and quality of mental health services in the United States.
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LIST OF ABBREVIATIONS

ACA ............................................................................................. Affordable Care Act
ADHD ................................................................. Attention Deficit Hyperactivity Disorder
AHRQ ................................................................. Agency for Healthcare Research and Quality
APA ................................................................. American Psychiatric Association
ATA ................................................................. American Telemedicine Association
C-MMSE ........................................................ Cantonese Mini Mental State Exams
C-RBMT ..................................................... Cantonese Rivermead Behavioral Memory Test
CAH ................................................................. Critical Access Hospital
CAMCOG .................................................... Cambridge Cognitive Capacity Scale
CBT ................................................................. Cognitive Behavioral Therapy
CDC ................................................................. Center for Disease Control
CDI ................................................................. Children's Depression Inventory
CMS ............................................................. Centers for Medicare and Medicaid
CPOE ............................................................ Computerized Physician Order Entry
CPT ................................................................. Cognitive Procedural Therapy
CPT ................................................................. Current Procedural Terminology
DEA ................................................................. Drug Enforcement Agency
DSM-III-R ..................................... Diagnostic Statistical Manual of Mental Disorders, 3rd Edition Revised
DSM-IV ............................................. Diagnostic and Statistical Manual of Mental Disorders, 4th Edition
EMR ................................................................. Electronic Medical Records
ERP ................................................................. Exposure and Ritual Prevention
FQHC ......................................................... Federally Qualified Health Center
GAF ......................................................... Global Assessment of Functioning
HCPCS ...................................................... Healthcare Common Procedure Coding System
HDRS ........................................................ Hamilton Depression Rating Scale
HDS ............................................................ Hierarchical Dementia Scale
HIPAA ........................................................ Health Information Portability and Accountability Act
HITECH ............... Health Information Technology for Economic and Clinical Health Act
HPSA ........................................................ Health Professional Shortage Area
HRSA ........................................................ Health Resources and Services Administration
IOM .............................................................. Institute of Medicine
K-SADS-P .... Schedule for Affective Disorders And Schizophrenia For School Age Children – Present Episode
KBPS ........................................................ Kilobytes per second
MDE ............................................................. Major depressive episode
MMSE ......................................................... Mini Mental State Examination
NAS-T ....................................................... Novaco Anger Scale Total Score
NCHS ........................................................ National Center for Health Statistics
NCS-A ......................................................... National Comorbidity Survey-Adolescents
NHANES .................................................... National Health and Nutrition Examination Survey
NIMH ......................................................... National Institute of Mental Health
NSCH ........................................................ National Survey for Children’s Health
NSDUH ....................................................... National Survey on Drug Use and Health
OCD ............................................................ Obsessive compulsive disorder
OCR................................................................. Office of Civil Rights
PCP................................................................. Primary care provider
PHI............................................................... Protected health information
PTSD............................................................. Post-traumatic stress disorder
RAS............................................................... Risk assessment schedule
RCT............................................................. Randomized controlled trial
SCID............................................................ Structured Clinical Interview for DSM
STAXI-2......................................................... State-Trait Anger Expression Inventory-2
INTRODUCTION

In the last two decades, many efforts have been made to improve healthcare availability, utilization and quality through legal and regulatory overhauls, health insurance reform, electronic health system infrastructure expansion, and development of new models of care. These efforts are perhaps most easily observed through the development and implementation of telehealth and telemedicine.

TELEHEALTH

According to the Health Resources and Services Administration (HRSA),

“Telehealth is the use of electronic information and telecommunications technologies to support long-distance clinical health care, patient and professional health-related education, public health and health administration”.

Telehealth encompasses all activities that employ technology to aid in the provision of health care, health administration, or health education. The Mayo Clinic suggests that telehealth includes but is not limited to electronic medical records (EMR), videoconferencing, remote monitoring, online patient portals and support groups, and the use of mobile devices like smartphones in the process of assessing, treating, communicating, scheduling, billing, and paying. They provide a good example demonstrating how a patient with diabetes might utilize telehealth in clinical, administrative and academic capacities to manage their condition. The patient may complete food, blood sugar, or medication logs; educate themselves about nutrition through videos; use phone applications to estimate insulin need; schedule appointments
with providers; access their medical records; ask questions over the phone, via email or instant messaging (Mayo Clinic Staff, 2014). A provider might use telehealth to look up patient records; order laboratory tests, confer with a colleague over videoconferencing or telephone; or listen to a grand rounds lecture. An administrator might use telehealth to coordinate schedules, manage websites, communicate with insurance companies, or order supplies.

While telehealth includes all applications of technology in all aspects of healthcare, telemedicine is specifically defined as the use of technology to deliver healthcare across distances (Weinstein et al., 2014).

TELEMEDICINE

Definitions and Descriptions

Telemedicine is the use of telecommunication technologies to deliver medical care across distances (Kuo, Ma, Lee & Bourne 2011). According to Weinstein et al. (2014), telemedicine allows patients, providers and administrators to take advantage of information technology and telecommunication to deliver healthcare without the requirement of colocation. Clinical activities conducted using these technologies include, but are again not limited to, diagnosis and assessment, referrals, monitoring, education, supervision, and direct provision of treatment (Hill et al., 2010; Smith, Besnick, Armfield, Stillman & Caffrey, 2005; Kuo, Ma, Lee & Bourne, 2011). In their article, “Telemedicine Defined”, the American Telemedicine Association (ATA) suggests that technology used for delivering care across distances includes, but is not limited to,
videoconferencing, store-and-forward or asynchronous videoconferencing, telephone, email, instant messaging, online patient portals and chat rooms, and remote monitoring devices. Telemedicine has the potential to be as flexible as patient, provider or administrator might need.

**History**

The first use of telemedicine was in 1905 when Dutch physician Willem Einthoven used the telephone to transmit heart sounds (Einthoven, 1906 as cited in Bashshur, Shannon, Krupinski, & Grigsby 2013). Five years later, in 1910, two American physicians transmitted various electrocardiograms (Williams, 1910 as cited in Bashshur et al., 2013). In 1920, Morse code was used to deliver medical advice to sea crafts (Schwamm LH, Audebert HJ, Amarenco P, et al., 2009). In the 100 years since its origin, telemedicine has been explored by almost all clinical specialties in terms of its effects on access to care, quality of care, and cost of care (Bashshur et al., 2013). The more recent evolution and development of telemedicine during the last century will be discussed later with respect to telemental health.

**Specialties, Patient Populations, Settings and Models**

According to a review by Weinstein et al. (2014), telemedicine has been explored by many specialties including, but not limited to, the following: radiology (Krupinski, 2008), cardiology (Raju & Prasad, 2012; Hindricks et al., 2014), dermatology (Duong et al., 2014; Whited et al., 2013), infectious disease (Kurth et al., 2014; León et al., 2011), neurology (Müller-Barna et al., 2014), ophthalmology (Verma, Arora, Kassam, Edwards & Damji, 2014), pathology, (Furness, 2007), pediatrics (Yang et al., 2014; Sharifi et al.,
Telemedicine practices can be found in hospitals (Yang et al., 2014), outpatient centers (Neufeld & Case, 2013), schools (Mackert & Whitten, 2007), prisons (Fox, Somes, & Waters, 2007), in the home, and anywhere people use mobile devices like laptops, tablets, or smartphones.

There are many different models for telemedicine application that depend largely on the type of specialty, the clinical activity being performed, the practice setting, and the kind of technology being used. Some models will be discussed later with respect to telemental health.

**TELEPSYCHIATRY**

*Definitions and Descriptions*

Telepsychiatry is the provision of mental healthcare services using telecommunication technologies. The observational and verbal nature of mental healthcare makes it particularly well suited to videoconferencing. (Myers, 2013; Grady, 2012) and other applications like telephone, text messaging and email.

*History*

As Hyler & Gangure (2002) pointed out, the fields of mental health and telecommunication have developed concurrently since 1844 when the American Psychiatric Association (APA) was founded and the telegraph was invented. While the first use of telemedicine occurred in 1905, the first modern use of telemental health was in the 1950s at the Nebraska Psychiatric Institute via Wittson & Dutton (1956). By the
1960’s, early researchers had demonstrated the basic effectiveness of telecommunications for mental health administration, education and treatment (Grady, 2012). By 1973, the terms “telepsychiatry” and “telemental health” were first mentioned in the literature (Dwyer, 1973). Since then, significant technological innovations; changes in provider, patient and public attitudes toward the effectiveness of telepsychiatry; changes in rules and regulations; and a growing, generally positive evidence base have made it more widespread.

Technological innovation in the 1980s and 1990s decreased costs and allowed the industry to see the potential for future applications (Grady 2012). By the 2000s, telecommunication technologies were inexpensive and available enough to allow for more widespread adoption (Grady 2012). Today, most households in the United States have both computer and Internet access. According to an American Community Survey Report on Computer and Internet Use in 2013, 83.8 percent of households reported owning a computer and 73.4 percent of households reported having a high-speed Internet connection (File & Ryan, 2013).

More recently, rules and regulations have been changing and creating a more hospitable climate for the continuation and development of telemental health. The ATA has developed video-based telemental health practice guidelines (Yellowlees, Shore, & Roberts, 2010); the Centers for Medicare and Medicaid (CMS) have implemented billing and reimbursement guidelines (Department of Health and Human Services: Centers for Medicare and Medicaid [DHHS], 2015); as of 2014, 23 states plus Washington DC have regulations that compel private insurance companies to reimburse
for telemedicine services (ATA, 2014); and the Affordable Care Act (ACA) imposes a variety of mandates that encourage the use of technology and the integration of primary care and mental health.

**SPECIFIC AIMS**

This paper summarizes published data concerning the clinical, financial, legal, regulatory, and technological aspects of telepsychiatry and explores how telepsychiatry might be used to improve the availability, utilization, and quality of mental health services in the United States.
PRESENTATION OF PUBLISHED DATA

After six decades, there exists substantial but still incomplete research regarding the many aspects of telepsychiatry. The largest and most comprehensive body of research addresses clinical concerns related to telepsychiatry. Other less complete but just as important areas of research address financial, legal, administrative, and technological aspects of telepsychiatry. This section attempts to outline existing research on each of these issues and briefly identify gaps in the current literature and propose possibilities for future research. This is not an exhaustive review and is designed to provide readers with a good sense of the issues in telepsychiatry and ultimately to support the discussion on how telepsychiatry can improve access to high quality mental healthcare.

Most of the studies referenced in this section address aspects of telepsychiatry in the United States. A few international studies are included to provide insight into issues not yet examined in American communities. Some of these studies are more applicable than others (i.e. financial and legal/regulatory studies are usually the least likely to be transferrable). Types of studies that are referenced and discussed include, but are not limited to, case studies, descriptive studies, feasibility studies, sustainability studies, correlation studies, and a few randomized controlled trials (RCT). Many studies are included in more than one section if they evaluated multiple aspects of telepsychiatry.

Included below, Table 1 outlines the major variables that should and will be considered with respect to telepsychiatry in this section.
Table 1: Summary of Relevant Telepsychiatric Issues. Table taken from Hilty et al., 2013.

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<tr>
<th>Measures</th>
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<tr>
<td>Starting points</td>
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<tr>
<td>Case report, series, or mix of patients</td>
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<tr>
<td>Project or program description</td>
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<tr>
<td>Qualitative analysis: impressions, perceptions, or information to form additional questions</td>
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<tr>
<td>Cost, cost comparison, or cost offset, often of &quot;direct&quot; costs</td>
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<tr>
<td>Project or program evaluation, sometimes retrospective</td>
</tr>
<tr>
<td>Smaller total n</td>
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<tr>
<td>Micro- (e.g., one party) analysis</td>
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<tr>
<td>Some control of variance or limited interplay of variables</td>
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<td>Cross-sectional analysis</td>
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<tr>
<th>Goals</th>
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<tr>
<td>Prospective, question-based</td>
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<td>Comparison group</td>
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<td>Study design &quot;same as&quot; or &quot;equal to&quot;</td>
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<tr>
<td>Noninferiority trials</td>
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<tr>
<td>Study design randomized controlled trial</td>
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<tr>
<td>Cost-effectiveness, -benefit analysis with computations of direct and indirect costs</td>
</tr>
<tr>
<td>Evaluation that &quot;drives&quot; the objectives and prospectively collected</td>
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<tr>
<td>Generally, larger total n (but not always guarantee &quot;good&quot; study)</td>
</tr>
<tr>
<td>Micro- (all parties individually) and macro- (system-wide = patient, provider, clinic, health system, community, and other parties) analyses</td>
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<tr>
<td>Analysis of variance</td>
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<td>Longitudinal analysis</td>
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<th>Access</th>
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<tr>
<td>Increased access to care</td>
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<td>Improved level or, quality of, existing care</td>
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<tr>
<td>Specific to the need [e.g., consultation–liaison rather than management (on)ly to primary care]</td>
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<tr>
<td>Complements or integrates service delivery (or prevents use of more intensive or costly service)</td>
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<th>Quality of care</th>
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<tr>
<td>Reliable/valid</td>
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<tr>
<td>Diagnosis and assessment</td>
</tr>
<tr>
<td>Detection of limitations and process to &quot;control&quot; for them is delineated</td>
</tr>
<tr>
<td>Improved level of, or quality of, existing care</td>
</tr>
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CLINICAL ISSUES

Diagnosis and Assessment

Can psychiatric diagnoses and assessments be made using telemedicine applications? What diagnostic and assessment tools have been explored? What measures have been used to compare telepsychiatric versus conventional diagnosis and assessment? Do diagnostic tests, evaluations and assessments have the same reliability and validity when administered using telepsychiatry as they do when administered in person?

Although diagnosis in telemental health may be aided by many technological applications, the primary tool used is videoconferencing. Most studies explore whether...
diagnostic tests, evaluations, and/or assessments administered through videoconferencing produce the same clinical outcomes has when administered in person. Such studies that evaluate the reliability and validity of telepsychiatry videoconferencing started using 128-384 kbps and are now conducted using at least 384kbps (Hilty et al., 2013).

The following diagnostic and assessment tools and resources have been used effectively through videoconferencing: Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) (Singh, Arya & Peters 2007), Risk Assessment Schedule (RAS) (Singh, Arya & Peters 2007), Structured Clinical Interview for Diagnostic and Statistical Manual II- Revised (SCID-III-R) (Shore, Savin, Orton, Beals & Manson 2007), English and Spanish versions of the Structured Clinical Interview for DSM (SCID-IV) (Morland , Greene & Rosen et al., 2009), Mini International Neuropsychiatric Interview (MINI) (Morland , Greene & Rosen et al., 2009), Cambridge cognitive capacity scale (CAMCOG) (Ball & Puffet 1998); Hamilton Depression Rating Scale (HDRS) (Kobak, Williams & Engelhardt 2008), Cantonese versions of the Mini Mental State Examination (C-MMSE) and the Rivermead Behavioral Memory Test (C-RBMT) (Poon, Hui, Dai, Kwok & Woo 2005).

*Study by Elford et al., (2000)*

In an early RCT, children and their parents completed psychiatric assessments through both virtual and in-person visits. Diagnosis and treatment recommendations were found to be the same in 96% of cases. Participating psychiatrists reported that videoconferencing was an adequate alternative but they still preferred the in-person visits. On the other hand, children and parents reported no significant difference in satisfaction.
between virtual and in person visits but parents said they preferred virtual visits because of the reduced travel burden (Elford et al., 2000).

*Study by Shore, Savin, Orton, Beals & Manson (2007)*

While researchers found no significant differences between groups when the Structured Clinical Interview for Diagnostic and Statistical Manual II- Revised (SCID-III-R) was administered to American Indian veterans either in person or through videoconferencing, their analysis revealed that externalizing disorders yielded greater agreement than internalizing disorders (Shore, Savin, Orton, Beals & Manson 2007).

*Study by Singh, Arya, & Peters (2007)*

During a primary, cross-sectional, single cluster, balance crossover, blind study researchers found that telepsychiatric assessments like the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) diagnoses, Risk Assessment Schedule (RAS), and both drug and non-drug interventions were dependable with a high degree of accuracy and inter-rater agreement when compared with conventional in-person assessments (Singh, Arya & Peters 2007).

*Study by Williams & Engelhardt (2008)*

No significant differences in score were found when the Hamilton Depression Rating Scale (HDRS) was administered by videoconferencing versus in-person (Kobak, Williams & Engelhardt 2008).

*Study by Morland, Greene & Rosen et al., (2009)*

English and Spanish versions of the Structured Clinical Interview for DSM (SCID) and the Mini International Neuropsychiatric Interview (MINI) have been
administered reliably and with validity using asynchronous telepsychiatry (Morland, Greene & Rosen, et al., 2009).

**Study by Szeftek et al., (2012)**

Researchers found that the use of videoconferencing as part of a collaborative care management model for patients with developmental disabilities led to a change in 70% diagnoses and 82% of medication. These results suggest that telepsychiatry can help PCPs provide better care for disabled patients by clarifying diagnoses and modifying treatment plans (Szeftek et al., 2012).

**Treatment**

Research has explored implementing the following kinds of treatment using telepsychiatry: Integrated/collaborative care (Fortney et al. 2013) (Fortney et al. 2007), cognitive behavioral therapy (CBT) (Himle et al., 2006; Vogel et al., 2012; Cuevas, Arredondo, Cabrera, Sulzenbacher, & Meise, 2006; Nelson, Barnard & Cain 2003), exposure and ritual prevention for obsessive compulsive disorder (OCD) (Goetter, Herbert, Forman, Yuen & Thomas, 2014), cognitive processing therapy (Morland et al., 2014), and anger management therapy (Morland et al., 2010). Researchers addressing treatment and interventions through telepsychiatry tend to be more robust than research on other aspects of telepsychiatry. There are a number of RCTs and other scientifically rigorous quantitative studies.

**Study by Zaylor et al., (1999)**

This retrospective analysis of patient health records found no significant difference between the percentage change in Global Assessment of Functioning Scores
when patients were seen using interactive videoconferencing or in-person (Zaylor et al., 2000).

*Study by Hunkeler et al., (2000)*

This randomized trial found no significant differences in HDRS scores and BDI scores when patients received treatment for depression through or through conventional in-person primary care services this treatment as usual plus a series of telephone calls with a nurse (Hunkeler et al., 2000).

*Study by Nelson, Barnard & Cain, (2003)*

During an 8-week study, children with depression were randomly assigned to receive CBT through 128kbps videoconferencing or face-to-face sessions. Results suggested that the CBT treatment was effective in both groups based on the pre-and post-treatment scores on the Schedule for Affective Disorders And Schizophrenia For School Age Children – Present Episode (K-SADS-P) and the Children's Depression Inventory (CDI). In fact, the videoconferencing group showed a faster decline in depressive symptoms according to the CDI than did the face-to-face group (Nelson, Barnard & Cain, 2003).

*Study by Bouchard et al., (2004)*

This study found that when CBT delivered through videoconferencing led to reduction of panic disorder related symptoms in 81% of patients post treatment and 91% upon a 6-month follow-up. Patients also reported high satisfaction with therapeutic alliance (Bouchard et al., 2004).
Study by Ruskin et al., (2004)

One hundred and nineteen (119) depressed veterans were randomly assigned to receive 6 months of medication management, psychoeducation and supportive counseling either in-person or via telepsychiatry. No significant between groups differences were found for HDRS scores, Beck Depression Inventory (BDI) scores, adherence, dropout rates and patient satisfaction. Results also suggest that telepsychiatry was more expensive than in-person treatment unless psychiatrists’ travel to the remote locations was factored into their analysis (Ruskin et al., 2004).

Frueh et al., (2005)

This study demonstrated the feasibility of delivering group therapy for alcohol abuse disorders using videoconferencing. Results showed that videoconferencing was comparable to in person care for variables like attrition, attendance and satisfaction (Frueh et al., 2005).

Study by De Las Cuevas, Arrenondo, Cabrera, Sulzenbacher & Meise (2006)

Cognitive behavioral therapy (CBT) is a popular topic in telepsychiatry research. During a 24-week study in which patients were randomly assigned to receive medication management and CBT from the same psychiatrist through conventional in-person settings or through videoconferencing, overall clinical improvement was observed but no statistically significant different was found between the conventional and telepsychiatric groups (De Las Cuevas, Arrenondo, Cabrera, Sulzenbacher & Meise, 2006).
Study by Himle et al., (2006)

This study demonstrated the feasibility of delivering CBT through videoconferencing (Himle et al., 2006).

Study by O’Reilly (2007)

This study found no significant differences in clinical outcomes and satisfaction between in-person and videoconferencing sessions (O’Reilly, 2007).

Study by Germain et al., (2009)

Result showed no significant difference in clinical outcomes when CBT was administered in-person versus using videoconferencing (Germain et al., 2009).

Study by Morland et al. (2010)

Veterans with diagnosed PTSD and anger issues were randomly assigned to receive 6 months of group anger management therapy in-person or via telepsychiatry. Both groups showed significant reductions in anger management symptoms as measured by the anger expression and trait anger subscales of the State-Trait Anger Expression Inventory-2 (STAXI-2) and by the Novaco Anger Scale total score (NAS-T). No significant between group differences were found regarding process variables including attrition, adherence, satisfaction, and treatment expectancy. However, the in-person group reported significantly higher group therapeutic alliance (Morland et al., 2010).

Study by Yellowlees et al. (2010)

This study demonstrated the feasibility and acceptability of using asynchronous telepsychiatry for offering psychiatric services (Yellowlees et al., 2010).
Study by Stubbings, Rees, Roberts & Kane (2013)

In yet another study, in which patients were randomly assigned to receive treatment either in person or via telepsychiatry (from the same therapist), no significant between groups differences were found for symptoms of depression, anxiety, stress, quality of life, client rating of working alliance, therapist rating of working alliance, or client rating of satisfaction. Furthermore, while no significant differences in reliable change were found for depression or anxiety, a significant difference in reliable change was found for stress, favoring the videoconferencing group (Stubbings, Rees, Roberts & Kane, 2013).

Together, these studies suggest that cognitive behavioral therapy can be delivered through videoconferencing at least as well as in-person and, in some cases, it may be even better. Research has also explored telepsychiatric treatment with veterans for mood disorders, post-traumatic stress disorder (PTSD), and schizoaffective disorder.

Study by Morland et al., (2014)

Rural, ethnically diverse veterans with PTSD were randomly assigned to receive cognitive processing therapy (CPT) in-person or via videoconferencing. No significant between groups differences were found for therapeutic alliance, treatment compliance, or satisfaction, (all high) and treatment expectancies (moderate). Both groups experienced equivalent reductions in symptoms (Morland et al., 2014).

Study by Porterfield, Engelbert, & Coustasse (2014)

This recent study found that e-prescribing can reduce prescribing errors, increase efficiency, and help manage healthcare costs (Porterfield, Engelbert & Coustasse, 2014).
**Patient Populations**

Research has explored using telemental health with many different populations. Common variables measured with respect to specific populations and telemental health includes, but are not limited to, clinical outcomes and satisfaction/acceptance of telepsychiatric treatment. Often a study involves a particular population (e.g., children) but that study’s outcomes (e.g., diagnostic equivalence) are only indirectly related to the defining and relevant characteristics for that population (e.g., age). Such studies are included in this section to provide evidence of 1) that population’s utilization of telepsychiatry and 2) interest in that population within telepsychiatric literature.

Research has explored telepsychiatry use with pediatric and geriatric populations, minorities/ethnic groups/immigrants, veterans, patients with disabilities, students, patients with comorbid mental and physical health disorders, and patients with isolating disorders.

**Pediatrics**

Some research has been conducted using telepsychiatry with children (Boydell, Volpe, & Pignatiello, 2010; Elford et al., 2000; Myers, Valentine, Morgenthaler, & Melzer, 2006; Myers, Valentine, & Melzer, 2007; Pakyurek, Yellowlees, & Hilty, 2010; Palmer et al., 2010). It seems that most studies regarding pediatric telepsychiatry address its feasibility and patient, parent, and provider satisfaction or offer qualitative discussions meant to inform future research. Increasingly, pediatric telepsychiatry research is moving toward more rigorous studies like RCTs of web-based data systems thus replicating work done with adult populations (Myers, Valentine, & Melzer, 2007).
Study by Elford et al., (2000)

As discussed earlier with respect to diagnosis and assessment, researchers found no significant differences between recommendations developed during in-person versus videoconferencing visits. The results also suggested that while children were equally satisfied with each method, parents were more satisfied with the reduced travel time associated with telepsychiatry (Elford et al., 2000).


In this RCT, children with depression were randomly assigned to receive CBT through videoconferencing or in-person visits. Analysis revealed that both groups experienced significant reduction of symptoms according to scores from the Schedule for Affective Disorders And Schizophrenia For School Age Children – Present Episode (K-SADS-P) and the Children's Depression Inventory (CDI). Interestingly, however, CDI scores declined faster in the videoconferencing group (Nelson, Barnard & Cain, 2003).

Study by Greenberg et al., (2006)

In this study, both children and parents reported high satisfaction with treatment delivered using videoconferencing despite the fact they experienced technical difficulties during the session (Greenberg et al., 2006).

Fortney et al., (2007)

This study compared clinical outcomes between telemedicine based collaborative care and in-person based collaborative care for depression. Results showed that patients who received collaborative care using videoconferencing reported larger gains in mental
health status, quality of life, and satisfaction than did patients who received treatment in-person (Fortney et al., 2007).

*Study by Myers, Valentine, & Melzer (2008)*

In an effort to expand access to mental health care in rural areas for children and adolescents, researchers examined patients’ utilization of and parents’ satisfaction with telepsychiatry over a 12-month period. Parents reported high satisfaction with videoconferencing. According to a retrospective analysis of billing data, the telepsychiatric services were well utilized (Myers, Valentine, & Melzer, 2008).

*Study by Boydell, Volpe, & Pignatiello (2010)*

This qualitative study explored adolescents’ experiences with telepsychiatry. Teens were enthusiastic about the novelty of the interaction and sometimes preferred the physical distance associated with telepsychiatry. Adolescents expressed that videoconferencing felt less intimidating than an in-person visit. They also expressed feeling less concerned about encountering the provider within the community (Boydell, Volpe, & Pignatiello 2010).

*Study by Lau et al., (2010)*

This study evaluated a pediatric telepsychiatry program in upstate New York using pre and post consultation forms completed by the referring clinic and telepsychiatrist, respectively. The telepsychiatrist clarified diagnoses and modified treatment plans. They changed existing medication plans for 80.8% of patients and recommended medication plans for 63.2% of patients without one already. The
telepsychiatrist also recommended family therapy for 71.1% of patients and school based therapy for 17.8% of patients (Lau et al., 2010).

*Study by Pakyurek, Yellowlees, & Hilty (2010)*

Children may prefer videoconferencing over in-person visits for their novelty, capacity to provide direction, physical and psychological distance, and the authenticity of the interaction (Pakyurek, Yellowlees, & Hilty, 2010).

*Study by Palmer et al., (2010)*

This research points to ADHD as one of the most prevalent psychiatric conditions among children and look to telepsychiatry to improve the care and outcomes of the underserved youth with ADHD (Palmer et al., 2010).

**Geriatrics**

RCT exploring the use of telepsychiatry with geriatric populations could not be found for this paper. Many of the studies discussed next use geriatric samples but are focused primarily on other aspects of telepsychiatry. These studies are still useful in that they demonstrate the interest in and general feasibility and acceptability of using telepsychiatry with older patients.

*Study by Lyketsos (2001)*

In this study, researchers reported that implementation of a low cost videoconferencing telepsychiatric system in a long-term care facility improved mental health care by reducing the length of hospitalizations and by providing an important intermediate between acute care and hospitalizations (Lyketsos, 2001).
Study by Poon, Hui, Dai, Kwok, & Woo (2005)

Another study, found that Cantonese versions of the Mini Mental State Examination (C-MMSE) and the Rivermead Behavioral Memory Test (C-RMBT) and the Hierarchical Dementia Scale (HDS) could be administered using telepsychiatry (Poon, Hui, Dai, Kwok, & Woo, 2005).

Study by Holden & Dew (2008)

When researchers compared pre-and post- patient and family survey data for in-person versus telepsychiatric treatment, results yielded positive correlations between telepsychiatry and reported satisfaction and between telepsychiatry and perceived effectiveness of treatment. That is, patients tended to be more satisfied and feel that treatment was more effective if they received telepsychiatric rather than in-person treatment (Holden & Dew 2008).

Study by Yeung et al., (2009)

Chinese nursing home patients experienced reduced symptom severity following telepsychiatric consultation and treatment. Patients’ families and involved providers reported high satisfaction with the videoconferencing (Yeung et al., 2009).

Rabinowitz et al., (2010)

This study analyzed the cost of telepsychiatric consultation service for rural nursing homes. All participants reported high satisfaction with the experience (Rabinowitz et al., 2010).
Minority and Ethnic Groups.

Providing culturally and linguistically appropriate mental health services can contribute positively to clinical outcomes. For example, using patients primary language may create a more comfortable atmosphere with a more authentic patient provider relationship in which patients can better express emotions (Hilty et al., 2013).

*Study by Shore, Savin, Orton, Beals, Manson (2007)*

This study demonstrated the reliability of the SCID for DSMIII-R with American Indians (Shore, Savin, Orton, Beals, Manson 2007).

*Study by Shore et al. (2008)*

The SCID-DSMIII-R was given to American Indian veterans during in-person and telepsychiatric visits on separate occasions. Results suggest that the interviews were comparable in terms of patient comfort/usability of technology, satisfaction, and cultural acceptance. It is worth noting, too, that interviewers often thought patients were less satisfied with the interview than patients ultimately reported (Shore et al. 2008).

*Study by Mucic (2010)*

Results of this study showed that the use of videoconferencing improved access, reduced waiting time and travel to bilingual providers, high satisfaction using native rather than secondary language (Mucic, 2010).

*Chong et al., (2010)*

This study demonstrated acceptability of videoconferencing for low income depressed Hispanic patients but found feasibility questionable (Chong et al., 2010).
**Study by Moreno, Chong, Dumbauld, Humke & Byreddy (2012)**

Hispanic patients were randomly assigned to receive care either in-person from a primary care physician (PCP) or using videoconferencing with a psychiatrist. Using depression rating scales and quality of life functional ability measures, researchers found that both groups experienced improved symptoms. (Moreno, Chong, Dumbauld, Humke & Byreddy, 2012).

**Study by Ye et al. (2012)**

Researchers examined telepsychiatry services established between Korean patients in Georgia and a culturally competent psychiatrist in located California. Patients completed a questionnaire that assessed usability, quality of the patient-provider interaction, satisfaction, and cultural competence. Patients reported liking the convenience and easy access, security, privacy, language and cultural appropriateness, and personal characteristics of the psychiatrist. However, patients reported disliking technical issues that affected the interaction and expressed difficulties establishing therapeutic rapport (Ye et al. 2012).

**Patients with Disabilities**

**Study by Lopez et al., (2004)**

In this study, results demonstrated the feasibility of using American Sign Language over videoconferencing for psychiatric treatment (Lopez et al., 2004).

**Study by Weiner, Rossetti & Harrah, (2011)**

This report describes a five-year telepsychiatry program that provided diagnostic and treatment services to Choctaw Indians in remote areas suffering from cognitive
impairment. Researchers made physical observations involving eyesight, hearing, facial expression, gate and station, coordination, tremor, rapid altering movements, psychomotor activity, and motor tests of executive functions using videoconferencing. Other tests were conducted in person (Weiner, Rossetti & Harrah, 2011).

Inmates

Manfredi et al., (2005)

This study demonstrated the feasibility of delivering psychiatric care to individuals in correctional facilities using videoconferencing (Manfredi et al., 2005).

Myers et al., (2006)

When telepsychiatric services were established in a youth correctional facility, 80% of participants received pharmacological treatment. Juvenile inmates expressed confidence with the process but expressed concerns about their privacy during and after sessions (Myers et al., 2006).

Study by Myers, Morgenthaler & Melzer (2008)

This study examined the use of telepsychiatry in incarcerated adolescents. Results showed that videoconferencing services were well utilized, comorbidity was common, substance abuse then ADHD were the most common diagnosis, and high satisfaction was reported (Myers, Morgenthaler & Melzer, 2008).

Practice Models

Collaborative and Integrated Care

In general, psychiatry can be part of primary care in several ways. In traditional referral/replacement models, the PCP refers a patient to a mental health care provider
who then becomes the exclusive provider of psychiatric services. In consultation-care models, the PCP offers psychiatric services following consultation with a specialty care provider. In collaborative care models, primary care provider and mental health care provider work together to provide services (Hilty et al., 2006).

Traditionally, visits between the mental healthcare provider and patient occurred in person, whether the mental health care provider was on-site with the primary care provider or in a different location. Telemental health expands patient and provider options by eliminating the need for colocation of the patient with the appropriate provider.

*Study by Fortney, Pyne, & Mouden et al., (2013)*

Researchers compared treatment of depression using in-person; practice-based collaborative care versus videoconferencing- based collaborative care. Results suggested that virtual team produced better clinical outcomes than the traditional “gold standard” primary care psychiatry (Fortney, Pyne, & Mouden et al., 2013).

*Study by Nesbitt, Marcin, Alexander, Hilty, Prescott (2002)*

When specialists consulted with PCPs, the specialist changed diagnoses and medications in 91% and 57% of cases, respectively. The consultations led to clinical improvements in led 56% of cases. (Nesbitt, Marcin, Alexander, Hilty & Prescott 2002 as cited in Yellowlees et al., 2011).

It is unclear whether consultation to rural primary care physicians is enough to supplement mental health care in rural areas (Clark & Yarborough 2013).
Gap Service Coverage.

*Study by Grady & Singleton (2011)*

Researchers found that on-call psychiatrists could use telepsychiatry to effectively provide coverage for peers who were on vacation or otherwise unable to attend to their patient in an inpatient psychiatric unit of a rural hospital (Grady & Singleton 2011).

Urgent Care and Emergency.

Like other specialties, telepsychiatry has been explored for use in urgent care settings. However, telepsychiatric emergency services have developed more slowly and are less well established than other emergency telemedicine applications like neurology (e.g., telestroke) and obstetrics (e.g., fetal monitoring) (Hilty et al., 2013). In urgent care settings, the use of telepsychiatry has the potential to reduce wait times and provide higher quality care.

*Study by Sorvaniemi et al., (2005)*

This study demonstrated the acceptability of and satisfaction with using videoconferencing in emergency settings (Sorvaniemi et al., 2005).

*Study by Southard, Neufeld and Laws (2014)*

A retrospective analysis of emergency department mental health visits found that implementation of videoconferencing based telepsychiatry improved efficiency and access to services by reducing time to treatment, length of stay, and door-to-consult time. (Southard, Neufeld, Laws 2014).

*Study by Seidel & Kilgus, (2014)*

Researchers compared in-person versus telepsychiatric emergency department
evaluations and found no significant differences between groups with respect to disposition recommendations, strength of recommendations, diagnosis, HCR-20 dangerousness scales or suicide scales (Seidel & Kilgus, 2014).

**Study by Trondsen, Bolle, Stensland & Tjora (2014)**

A qualitative explorative study of a telepsychiatric emergency program in rural North Norway found that having available videoconferencing with a specialist improved confidence in dealing with difficult psychiatric cases by strengthening patient involvement, reducing uncertainty, sharing responsibility, and functioning as a safety net (Trondsen, Bolle, Stensland & Tjora 2014).

**Disaster**

A number of studies have explored the use of telepsychiatry in natural disasters like tsunamis (Vetter et al., 2011) and hurricanes (Harvey, Smith, Abraham, Hood, & Tannebaum 2007; Combs 2007; Ruggiero et al., 2012) and manmade disasters like terrorist attacks (Ruggiero et al., 2006). Telepsychiatry utilizing videoconferencing may have the potential to reach larger numbers of people faster than conventional in person services. Post disaster applications of telepsychiatry could also offer higher quality services like evaluation, triage and/or interventions rather than just information, as has been offered via telephone hotlines in the past (Clark & Yarborough 2013).

Internet-based interventions have the potential to provide cost-effective and clinically effective interventions to a broad audience and are easily integrated as part of a stepped care approach to healthcare (Ruggiero et al., 2012).
**Ruggiero et al., (2006)**

This study demonstrated feasibility of using internet-based mental health services for individuals in post-disaster areas. Participants reported high satisfaction, ease of use and perceived helpfulness (Ruggiero et al., 2006).

**Study by Combs (2007)**

This study demonstrated the feasibility of mental health support services delivered by telephone to disaster-affected individuals following Hurricane Katrina (Combs, 2007).

**Harvey, Smith, Abraham, Good & Tennebaum, (2007)**

This study demonstrated the feasibility of using a web-based monitoring system to collect data on experiences and self-reported psychological distress following Hurricane Katrina (Harvey, Smith Abraham, Good & Tennebaum, 2007).

**Mobile Health.**

Mobile health describes use of mobile devices like cell phones, laptops, and tablets, to facilitate healthcare activities (Weinstein et al., 2014). Mobile health can be used to deliver healthcare anywhere patients and providers are located. Mobile health makes particular use of applications or "apps" on mobile devices. An app is a specialized software program that can run on mobile devices and are currently used to facilitate direct delivery of care, real-time monitoring of patients, communication between patients and providers, or communication among providers.

Table 2 summarizes the most salient and pertinent clinical studies.
Table 2: Summary of Relevant Clinical Studies.

<table>
<thead>
<tr>
<th>Study</th>
<th>Patient Population</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ball &amp; Puffett (1998)</td>
<td>Geriatric outpatients-inner city</td>
<td>Found that CAMCOG can be used reliably over videoconferencing</td>
</tr>
<tr>
<td>Zaylor et al. (1999)</td>
<td>Adult outpatients</td>
<td>No significant difference in GAF scores found when administered in-person and via videoconferencing</td>
</tr>
<tr>
<td>Elford et al. (2000)</td>
<td>Children</td>
<td>No significant differences found between diagnosis and treatment recommendations developed during in-person and videoconferencing sessions</td>
</tr>
<tr>
<td>Hunkeler et al. (2000)</td>
<td>Adult primary care outpatients</td>
<td>Found that Hamilton Depression Rating Scale scores and Beck Depression Inventory scores decreased significantly following a series of telephone calls with a nurse</td>
</tr>
<tr>
<td>Lyketsos (2001)</td>
<td>Geriatric outpatients</td>
<td>Found that use of telespsychiatry reduced number and length of hospitalizations and provided an important intermediate between acute and long term care</td>
</tr>
<tr>
<td>Nesbitt, Marvin, Alexander, Hilty &amp; Prescott (2002)</td>
<td>Adults</td>
<td>Specialists changed the diagnosis and medications in 91% and 57% of cases, respectively with primary vary interventions led to clinical improvements in 56% of cases</td>
</tr>
<tr>
<td>Nelson et al. (2003)</td>
<td>Children</td>
<td>No significant difference in treatment outcome or satisfaction when delivered in person or via telespsychiatry</td>
</tr>
<tr>
<td>Bouchard et al. (2004)</td>
<td>Adults</td>
<td>CBT delivered through videoconferencing led to reduction of panic disorder related symptoms in 81% of patients post treatment and 91% upon a 6 month follow-up; patients also reported high satisfaction with therapeutic alliance</td>
</tr>
<tr>
<td>Ruskin et al. (2004)</td>
<td>Adult veterans</td>
<td>No significant differences found in clinical outcomes when treatment for depression was delivered in person or using videoconferencing</td>
</tr>
<tr>
<td>Freuh et al. (2005)</td>
<td>Adult outpatients with alcohol abuse disorders</td>
<td>Demonstrated feasibility of delivering group therapy for alcohol abuse disorders using videoconferencing; videoconferencing was found to be comparable to in person care for attrition, attendance and satisfaction</td>
</tr>
<tr>
<td>Manfredi et al. (2005)</td>
<td>Adult inmates</td>
<td>Demonstrated feasibility of delivering psychiatry care to inmates through videoconferencing</td>
</tr>
<tr>
<td>Poon et al. (2005)</td>
<td>Geriatric dementia in-patients</td>
<td>Demonstrated feasibility, acceptability and effectiveness of delivering the C-MMSE, C-RMBT and HDS through videoconferencing</td>
</tr>
<tr>
<td>Sorvaniemi et al. (2005)</td>
<td>Adult ER patients</td>
<td>Demonstrated acceptability of and satisfaction with using videoconferencing in emergency settings</td>
</tr>
<tr>
<td>Study</td>
<td>Patient Population</td>
<td>Results</td>
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<tr>
<td>De Las Cuevas et al. (2006)</td>
<td>Adult Outpatients</td>
<td>Found no significant difference in clinical outcomes when treatment was delivered -person or using videoconferencing</td>
</tr>
<tr>
<td>Greenburg et al. (2006)</td>
<td>Children</td>
<td>Children and parents reported high satisfaction with treatment delivered through videoconferencing, despite some technical difficulties</td>
</tr>
<tr>
<td>Himle et al. (2006)</td>
<td>Adults with OCD</td>
<td>Demonstrated feasibility of delivering CBT through videoconferencing</td>
</tr>
<tr>
<td>Myers et al. (2006)</td>
<td>Incarcerated Adolescents</td>
<td>80% of youth received pharmacological treatment and expressed confidence with efficacy but concerns with privacy</td>
</tr>
<tr>
<td>Ruggiero et al. (2006)</td>
<td>Adults in post-disaster areas</td>
<td>Demonstrated feasibility of internet-based mental health services for post-disaster areas; Participants reported high satisfaction, ease of use and perceived helpfulness</td>
</tr>
<tr>
<td>Combs (2007)</td>
<td>Adults</td>
<td>Demonstrated feasibility of mental health support services delivered by telephone following Hurricane Katrina</td>
</tr>
<tr>
<td>Fortney et al. (2007)</td>
<td>Adult outpatients</td>
<td>Found that patients who received collaborative care using videoconferencing reported larger gains in mental health status, quality of life, and satisfaction than did patients who received treatment in-person</td>
</tr>
<tr>
<td>Harvey, Smith, Abraham, Good &amp; Tannebaum (2007)</td>
<td>Adults</td>
<td>Demonstrated feasibility of using a web-based monitoring system to collect data on experiences and self-reported psychological distress following Hurricane Katrina</td>
</tr>
<tr>
<td>O’Reilly (2007)</td>
<td>Adult outpatients</td>
<td>Found no significant differences in clinical outcomes and satisfaction between in-person and videoconferencing sessions; videoconferencing was found to be at least 10% less expensive per session</td>
</tr>
<tr>
<td>Shore, Savin, Orton, Beals &amp; Manson (2007)</td>
<td>American Indian veterans</td>
<td>Found no significant differences for assessment scores when the SCID DSM-III-R was administered in-person or using videoconferencing sessions; externalizing disorders yielded significantly greater concordance than internalizing disorders</td>
</tr>
<tr>
<td>Singh, Arya, &amp; Peters (2007)</td>
<td>Adult outpatients</td>
<td>Found that DSM-IV diagnoses, RAS, and drug/non drug interventions are dependable with a high degree of accuracy and interrater reliability when compared with conventional in person assessments</td>
</tr>
</tbody>
</table>
### Table 2: Summary of Relevant Clinical Studies Continued

<table>
<thead>
<tr>
<th>Study</th>
<th>Patient Population</th>
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<tbody>
<tr>
<td>Kobak, Williams &amp; Englehardt (2008)</td>
<td>Adults, Doctoral level providers</td>
<td>Found no significant differences in score when HDRS was administered by in-person or using videoconferencing</td>
</tr>
<tr>
<td>Myers, Valentine, Morgenthaler &amp; Melzer (2008)</td>
<td>Incarcerated adolescents</td>
<td>Found that videoconferencing services were well utilized, comorbidity was common, substance abuse then ADHD were the most common diagnosis, high satisfaction was reported</td>
</tr>
<tr>
<td>Shore et al. (2008)</td>
<td>Male Adult patients</td>
<td>Found no significant differences for assessment, interaction, satisfaction, comfort level or cultural competency between in-person and videoconferencing sessions</td>
</tr>
<tr>
<td>Germain et al. (2009)</td>
<td>Adults with PTSD</td>
<td>Found no significant difference in clinic outcomes when CBT was administered in-person versus using videoconferencing</td>
</tr>
<tr>
<td>Boydell, Volpe &amp; Pignatiello (2010)</td>
<td>Adolescents</td>
<td>Found that teens were enthusiastic about and sometimes preferred videoconferencing</td>
</tr>
<tr>
<td>Morland et al. (2010)</td>
<td>Rural Veterans with PTSD</td>
<td>Found no significant differences for STAXI-2 scores, NAS-T scores, attrition, adherence, satisfaction and treatment expectancies when anger management therapy was delivered in-person or using videoconferencing</td>
</tr>
<tr>
<td>Mucic (2010)</td>
<td>Adult Asylum Seekers, Refugees and Migrants</td>
<td>Use of videoconferencing improved access, reduced waiting time and travel to bilingual providers, high satisfaction using native rather than secondary language</td>
</tr>
<tr>
<td>Myers et al. (2010)</td>
<td>Children and Adolescents</td>
<td>“Parents satisfaction higher with school aged children than with adolescents; high adherence to treatment</td>
</tr>
<tr>
<td>Pakyurek et al. (2010)</td>
<td>Children and adolescents in primary care</td>
<td>Suggests that children and adolescents may prefer videoconferencing for its novelty, psychological distance, physical distance, and authenticity</td>
</tr>
<tr>
<td>Rabinowitz et al. (2010)</td>
<td>Geriatric inpatients</td>
<td>Found that use of videoconferencing reduced travel time, fuel costs, physician travel time, and personnel costs</td>
</tr>
<tr>
<td>Yellowlees et al. (2010)</td>
<td>Non-ER Adult Patients</td>
<td>Demonstrated feasibility of asynchronous telepsychiatry</td>
</tr>
</tbody>
</table>
Table 2: Summary of Relevant Clinical Studies Continued

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<tr>
<th>Study</th>
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<tbody>
<tr>
<td>Grady &amp; Singleton (2011)</td>
<td>Adults</td>
<td>Demonstrated initial feasibility of videoconferencing for the delivery of short-term psychiatric coverage to a rural general hospital</td>
</tr>
<tr>
<td>Lau et al. (2010)</td>
<td>Children and Adolescents</td>
<td>“Video reaches a variety of children with consultants providing diagnostic clarification and modifying treatment”</td>
</tr>
<tr>
<td>Weiner et al. (2011)</td>
<td>Rural adult and geriatric dementia patients</td>
<td>Demonstrated feasibility of videoconferencing as an alternative to in-person visits for patients with cognitive impairment in remote area</td>
</tr>
<tr>
<td>Chong et al. (2012)</td>
<td>Adult patients</td>
<td>Demonstrated acceptability of videoconferencing for low income depressed Hispanic patients, but found feasibility questionable</td>
</tr>
<tr>
<td>Moreno et al. (2012)</td>
<td>Adult Outpatients</td>
<td>Found that use of videoconferencing significantly improved depressive symptoms, functionality, and quality of life in Hispanic patients</td>
</tr>
<tr>
<td>Ruggiero et al. (2012)</td>
<td>Adults</td>
<td>Demonstrated the initial feasibility and acceptability of a web-based intervention program designed to promote resilience and recovery following disasters</td>
</tr>
<tr>
<td>Szeftel et al. (2012)</td>
<td>Adolescents</td>
<td>Use of videoconferencing led to a change in 70% diagnoses and 82% of medication; videoconferencing helped PCPs with developmental disabled patients</td>
</tr>
<tr>
<td>Ye et al. (2012)</td>
<td>Adult outpatients</td>
<td>Use of native language facilitates expression of feelings, emotions, discomfort and social stressors</td>
</tr>
<tr>
<td>Fortney et al. (2013)</td>
<td>Adult patients</td>
<td>Greater symptom reduction for videoconferencing collaborative care group</td>
</tr>
<tr>
<td>Stubbings, Reese, Roberts &amp; Kane (2013)</td>
<td>Adults</td>
<td>Found no significant differences for symptoms of depression, stress, quality of life, client rating of working alliance, therapist rating of working alliance, or client ratings of satisfaction;</td>
</tr>
<tr>
<td>Yellowlees et al. (2013)</td>
<td>English and Spanish speaking patient</td>
<td>Found no significant differences for ATP involving English and Spanish speaking patients</td>
</tr>
<tr>
<td>Goetter, Herbert, Forman, Yuen &amp; Thomas (2014)</td>
<td>Adults with OCD</td>
<td>Demonstrated initial feasibility and acceptability of videoconferencing for delivering ERP</td>
</tr>
<tr>
<td>Morland et al. (2014)</td>
<td>Rural and ethnically diverse veterans</td>
<td>Found no significance differences for reduction of symptoms, therapeutic alliance, treatment compliance, satisfaction, and treatment expectancy when CPT was delivered in-person or using videoconferencing</td>
</tr>
<tr>
<td>Southard, Neufeld &amp; Laws (2014)</td>
<td>ER-patients</td>
<td>Found that implementation of videoconferencing reduced time until treatment, length of stay and door to consult time</td>
</tr>
</tbody>
</table>
FINANCIAL ISSUES

When evaluating the financial feasibility and sustainability of telemental health and when developing business plans or making policy changes, it is not only important to consider different kinds of costs for patients, providers, and the community but also to be cognizant of the type of cost analysis being used (Hilty et al., 2013). As part of a systematic review, researchers revealed that 63% of included studies addressed cost to the provider, while 33% addressed societal costs and only one considered costs with respect to the patient (Wade, Karnon, Elshaug, & Hiller 2010). However, summaries of patient expenses can be found fairly easily through insurance and billing reports. Costs for the patient usually include insurance, out-of-pocket expenses, travel expenses, lost compensation from missing work, and medications.

Costs for the provider and/or healthcare organization (e.g., hospitals or clinics) are more complicated and harder to analyze than are patient costs. In any business, the total cost of producing a good, or in the case of medicine, providing a service is comprised of fixed and variable and direct and indirect costs. Fixed costs are expenses that do not vary with production output while variable costs are expenses tied to production output. Direct costs can be completely attributed to the production of a specific product or services while indirect costs are less easily associated with production. In telepsychiatry, direct costs include equipment, installation of telephone or Internet lines, provider salaries etc. while indirect costs might include the depreciation of the equipment, administrative expenses, building expenses, and travel.

The societal costs of healthcare are perhaps the most nebulous part of a
telepsychiatry cost analysis and are not usually discussed. The biggest societal costs are likely the costs of untreated mental illness.

Cost can be analyzed using a number of possible models including the cost offset model, the cost minimization model, cost effectiveness model, and a cost benefit analysis (Hilty et al., 2013). In addition to considering cost, it is important to consider different sources revenue.

**Findings**

Hilty et al. (2013) provide an important summary of the telemedicine cost studies conducted between 1998 and 2012. There are however, analyses of the cost effectiveness of telepsychiatry that are not included in their review. Many studies consider cost effectiveness of telepsychiatry as part of a larger analysis of telepsychiatry and these studies are not included in the summary by Hilty et al (2013). Other reports not included in that summary comprise less rigorous but still important studies considering the financial aspects of telepsychiatry. Furthermore, the authors do not include cost studies from other areas of telemedicine that could still provide insight into the cost of providing telepsychiatry services. Of course, some of the older studies are less relevant and newer studies conducted after the publication of the summary are not included. Some of those are discussed here (Table 3).

**Study by Simpson (2001)**

This study found that a telepsychiatry program could break even when videoconferencing was used for at least 224 consultations/year; fewer consultations were required if technology was also used for administration (Simpson, 2001).
Study by Hailey (2002)

This study found that telepsychiatry could reduce costs to rural mental health services patients (Hailey, 2002).


This study found that using videoconferencing could save $400/consultation (Edwards et al., 2003).

Study by Ruskin et al., (2004)

Results from this study revealed that videoconferencing cost more than in-person visits unless the psychiatrist had to travel more than 22 mile. If the psychiatrist had to travel more than 22 miles to reach the patient, videoconferencing was more cost effective. Reduced travel time saved money directly by saving money on travel related expenses and indirectly by allowing psychiatrists to see more patients (Ruskin et al., 2004).

Study by Cluver et al., (2005)

This American study found that home use of portable videoconferencing was acceptable but costly (Cluver et al., 2005).

Study by Jong (2005)

Researchers found that use of videoconferencing saved $2,000/consultation and saved the government a total of $140,088 in 2003 (Jong, 2005).

Study by Persaud, Jreige, Skedgel, Finley, Sargeant, & Hanlon, (2005)

This incremental cost analysis study in Nova Scotia found that above a certain workload, telepsychiatric services were more cost effective for the community than
conventional in-person (Persaud, Jreige, Skedgel, Finley, Sargeant, Hanlon 2005).

Study by Harley (2006)

Researchers in the United Kingdom found that videoconferencing sessions for rural patients were four times less expensive than in-person sessions once a 5-6 session threshold was reached (Harley, 2006).

Study by Modai et al., (2006)

This Israeli study actually found that videoconferencing sessions were more expensive than in-person sessions. This study also found that telepsychiatric sessions resulted in more hospitalizations than in-person sessions (Modai et al., 2006).

Study by Smith et al., (2007)

In this Australian study, telepsychiatric services were 1/6 as expensive as in-person services per consultation session (Smith et al., 2007).

Study by O’Reilly et al., (2007)

This American study found that videoconferencing was 10% less expensive than in-person services. In other words, telepsychiatry only cost 90% as much as treatment as usual (O’Reilly et al., 2007).

Study by Pyne et al., (2010)

This American study found that telemedicine based collaborative care was more expensive than in-person based collaborative care (Pyne et al., 2010).

Study by Rabinowitz et al., (2010)

This study found that use of videoconferencing reduced travel time, fuel costs, and personnel costs (Rabinowitz et al., 2010)
**Study by Spaulding, Belz, DeLurgio & Williams (2010)**

This original research considered the costs of telepsychiatry to patients (e.g., travel related costs) and providers (e.g., fixed and variable costs of providing the consultation- but not start-up costs) and found that “patient travel costs substantially offset the provider costs of service”. (Spaulding, Belz, DeLurgio & Williams, 2010, p. 871).

**Study by Wade, Karnon, Elshaug, & Hiller, (2010).**

In this systematic review, researchers reported that 61% of the included studies found that using real time video conferencing was less expensive than treatment as usual while 31% found greater costs, and 9% found mixed results (Wade, Karnon, Elshaug & Hiller 2010).

**Study by Butler & Yellowlees (2012)**

This study found that ATP cost $68/consultation, videoconferencing cost $107/consultation and in-person services cost $96/consultation (Butler & Yellowlees, 2011)

**Study by Ong, Moors & Shivaraman (2014)**

This Australian study compared the life cycle energy, carbon and time costs of both videoconferencing sessions and in-persons sessions. Results showed that videoconferencing is at most 7% as expensive as in-person sessions with regard to energy and carbon costs. However, telepsychiatry’s advantages over in-person services are reduced if time costs are factored into the analysis (Ong, Moors, & Shivaraman 2014).
Study by Saeed, Diamond, & Bloch, (2011)

As part of a study conducted in North Carolina researchers gathered data about emergency mental health services before and after implementation of telepsychiatry for mental health consultations. Hospitals paid a monthly subscription fee based on their volume of use to bridge the gap between cost of the service and the amount of reimbursement. Researchers looked at patient and provider satisfaction, patient lengths of stay, number of involuntary commitments overturned, 30 day recidivism rates, and payer mix. Before implementation of telepsychiatry, patients waited an average of 2.6 days before receiving specialized treatment or inpatient placement. After implementation, patient stays were reduced to an average of just 22 hours. After consulting with a psychiatrist, 27% of involuntary commitments were overturned. They calculated an estimated savings of $469,800 for the state facility (based on Medicaid rate of $665.71, average 5 day inpatient stay and 45% self-pay population). These results suggest that emergency telepsychiatric consultations can provide significant costs savings by reducing inpatient hospital stays and overturning or avoiding involuntary commitments (Saeed, Diamond, & Bloch, 2011).

Study by Antionetti, Drude, & Rowe (2014)

In this study, the ATA administered a survey to members to collect data on their insurance and telehealth use. Respondents included clinicians and administrators in all states (except for NH, ND and VT). A total of 45% of respondents reported that they or their organization bill for telemedicine services and that the major reason for not billing were major insurance companies will not reimburse services, Medicaid will not
reimburse telemedicine services, respondents practice in an urban area (which are less likely to be covered) or that services were bundled as part of a larger contract. Some respondents reported not understanding how to bill or which billing codes to use (Antionetti, Drude, & Rowe 2014).

*Study by Hilt et al., (2015)*

This American study examined a Medicaid based child telepsychiatry program. Results showed that the program significantly reduced unnecessary hospitalizations and the associated costs. Researchers called a 1.82 return on investment for the program (Hilt et al., 2015).
<table>
<thead>
<tr>
<th>Study</th>
<th>Country</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Canada</td>
<td>Cost $400 per consultation via video or in person</td>
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<td>Found that use of home-delivered portable videoconferencing was acceptable but costly</td>
</tr>
<tr>
<td>Persaud et al., (2005)</td>
<td>Canada</td>
<td>Found through an incremental cost analysis that telepsychiatric services were more cost effective for the community above a certain threshold workload</td>
</tr>
<tr>
<td>Persaud et al., (2005)</td>
<td>Canada</td>
<td>Found that telepsychiatry services were more cost effective than in-person services above a certain workload</td>
</tr>
<tr>
<td>Harley (2006)</td>
<td>UK</td>
<td>Found that videoconferencing sessions in rural areas cost 4x less than in-person sessions once a 5-6 session threshold was reached.</td>
</tr>
<tr>
<td>Modai et al., (2006)</td>
<td>Israel</td>
<td>Found that one hour of videoconferencing was more expensive than one hour of in-person services and hospitalizations were more frequent</td>
</tr>
<tr>
<td>O'Reilly et al., (2007)</td>
<td>Canada</td>
<td>Found that videoconferencing cost 10% less per session</td>
</tr>
<tr>
<td>Shore et al., (2007)</td>
<td>US</td>
<td>Found that telepsychiatric services cost less than in-person services</td>
</tr>
<tr>
<td>Smith et al., (2007)</td>
<td>Australia</td>
<td>Found that telepsychiatric services cost $600/consultation compared with $100/consultation for in-person services</td>
</tr>
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<td>Pyne et al., (2010)</td>
<td>US</td>
<td>Found that telemedicine-based collaborative care for depression was more expensive than in-person collaborative care</td>
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<td>Rabinowitz et al., (2010)</td>
<td>US</td>
<td>Reduced travel time, fuel costs, physician travel time, personnel costs</td>
</tr>
<tr>
<td>Spaulding, Belz, DeLurgio &amp; Williams (2010)</td>
<td>US</td>
<td>Found that cost minimization through reduced patient travel associated with videoconferencing offset the costs to providers.</td>
</tr>
<tr>
<td>Wade, Karnon, Elshaug &amp; Hiller (2010)</td>
<td>US</td>
<td>Reviewed articles and reported that 61% of the included studies found that telepsychiatry was less expensive than in-person treatment while 31% found it was more expensive, and 9% found mixed results</td>
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Table 3. Summary of Financial Studies Continued

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<td>Butler &amp; Yellowlees (2012)</td>
<td>US</td>
<td>ATP and video fixed costs $7,000 and $20,000, respectively, and per consultation ATP was $68.18, video was $107.50, and in-person $96.36; this means ATP is most cost-effective at 249 consultations/year.</td>
</tr>
<tr>
<td>Antionetti, Drude, &amp; Rowe (2014)</td>
<td>US</td>
<td>Found that 45% of responding clinicians and administrators did not bill for videoconferencing because private insurance would not reimburse telepsychiatric services, Medicaid would not reimburse, or the respondents lived in an uncovered rural area</td>
</tr>
<tr>
<td>Ong, Moors, &amp; Shivaraman (2014)</td>
<td>Australia</td>
<td>After comparing the life-cycle energy, carbon and time costs of videoconferences and in-person meetings, found that videoconferencing takes at most 7% of the energy/carbon of an in-person meeting if time costs are left out of the analysis. If time costs are considered, videoconferencing advantages are reduced.</td>
</tr>
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<td>Hilt et al., (2015)</td>
<td>US</td>
<td>Found that a coordinated child telepsychiatry Medicaid program reduced unnecessary hospitalizations and costs, yielding a 1.82 return on investment</td>
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Financing Telepsychiatry

Reimbursement – Medicare, Medicaid and Private Payers

Any discussion of healthcare and cost must include a discussion of public and private reimbursement. Medicare, Medicaid and many more private payers have started reimbursing for telemedicine services under certain conditions (Deslich, Stec, Tomblin & Coustasse, 2013). The Centers for Medicare and Medicaid Services (CMS) suggest that providers use the Current Procedural Terminology (CPT) codes used for billing in-person services plus the Healthcare Common Procedure Coding System (HCPCS) modifier code to indicate that the services were delivered using telepsychiatry (Deslich, Stec, Tomblin & Coustasse, 2013).

However, there are limits to where and when this combination of billing codes can actually be utilized. CMS limit reimbursement to certain CPT codes, certain providers, and to patients in certain places (Kang et al., 2010 as cited in Deslich, Stec, Tomblin & Coustasse, 2013). A patient must be in a non-metropolitan statistical area, within a rural census tract inside an metropolitan statistical area, within a health professional shortage area (HPSA) or a federally qualified health center (FQHC). The originating site must be a qualifying facility and an approved skilled provider must accompany the patient. Qualifying facilities include major hospitals, critical access hospitals (CAH), skilled nursing facilities (SNF), rural health clinics (RHCs), community mental health centers, and offices of approved providers. Telemedicine services approved by CMS include, but are not limited to, initial inpatient consultations, follow-up inpatient consultations, office or other outpatient visits, individual psychotherapy, pharmacologic
management, psychiatric diagnostic interviews and examinations, neurobehavioral status exams, and individual health and behavior assessment interventions (HBAI) (Secure Telehealth-Medicare Reimburses for Telehealth, 2015). Approved providers at the distant site include physicians, physician assistants, nurse practitioners, clinical nurse specialists, nurse midwives, clinical psychologists, clinical social workers, and nutrition professionals (Secure Telehealth-Medicare Reimburses for Telehealth, 2015)

Furthermore services must be delivered using interactive telecommunication system, which they define as. Telephone, fax and email do not qualify for reimbursement. Store-and-forward asynchronous services are permitted so long as the originating site is part of a federal demonstration program in the state of Alaska or Hawaii (Secure Telehealth-Medicare Reimburses for Telehealth, 2015).

When providers do bill Medicare or Medicaid for telemedicine services, providers at the distant site may receive payment for services and the originating site may receive a facility fee. In general, CMS reimburses the telemedicine provider the same rate the traditional provider while the originating site receives a payment of $18 per session to cover technology and supervision costs (Secure Telehealth-Medicare Reimburses for Telehealth, 2015). Sometimes, indirect costs like technical support, data transmission charges, and equipment expenses can be included in reimbursement (Deslich, Stec, Tomblin & Coustasse, 2013).
Factors Associated with Financial Success.

Having a good business plan is essential to establishing an effective and sustainable telepsychiatry program (Krupinski & Weinstein 2013). Ideally, a telemedicine business model is based on successful experiences and specific outcomes with clearly defined expectations and a variety of sources of revenue (Bashshur, 2013). Telepsychiatry programs without these characteristics tend to unsustainable and fail after the pilot period. Many programs start out relying heavily on grant funding and oversight, only to collapse when the grant expires (ATA, Special Interest Group on Business and Finance, n.d.).

The AMD Global Telemedicine Company identifies 10 steps necessary for a successful telemedicine program: 1) establish a vision; 2) building a long-term financial plan; 3) create a convenient and effective work environment; 4) mainstream telemedicine into the standard care process; 5) plan and assure effective training; 6) make sure you have a full-time coordinator and an effective leader and cheerleader; 7) a project plan equals manageable milestones equals reasonable expectations; 8) horizontal versus vertical implementation; 9) good marketing is critical and 10) publish or perish (AMD Global Telemedicine- Keys to a successful telemedicine program, 2015).
LEGAL AND REGULATORY ISSUES

Telepsychiatry presents unique issues concerning licensing, use of protected health information, health insurance and other minor legal and regulatory topics.

_Licensing._

Traditionally medical licensing occurs in the state in which the service is delivered. If you have a license to practice in Massachusetts you can only practice in Massachusetts. Before telemedicine, this was not a problem because provider and patient were always co-located. Occasionally mental health providers offer advice over the phone but since phone calls are not usually covered by public or private insurance and are not meant as substitutes for in person care, they present less of a problem. However, with the advent of videoconferencing, patients and providers no longer need to be co-located. Providers have the ability to deliver care to patients anywhere.

There are no federal laws governing the practice of telemedicine. (Deslich, Stec, Tomblin & Coustasse, 2013). With some exceptions, providers must hold a medical license in the state where the patient is located during the time of psychiatric encounter (Shore, 2013). Providers should always be aware of state and federal regulations, payer regulations, and regulations from other licensing bodies (e.g., the Drug Enforcement Agency). In 2014, the ATA publishes a document titled _The State Telemedicine Gap Analysis: Coverage and Reimbursement_ that details the policy landscape across states (Thomas & Capistrant 2014). The report bases its analysis on 13 indicators related to coverage and reimbursement. The indicators used include parity laws (for private insurance coverage, Medicaid coverage and state employee health plan coverage) and
Medicaid service coverage & conditions of payment (includes patient settings, eligible technologies, distance and geography restrictions, eligible providers, physician provided telemedicine services, mental and behavioral health services, rehabilitation services, home health services, and telepresenter requirements). An additional category was included to that any innovative payments and service delivery model in each state. Seven states scored in the “A”, suggesting that their legal and regulatory policies are supportive of telemedicine adoption and practice. Twenty-one states plus D.C score in the “B” range and 19 in the “C”. Three states scored in the “F” range suggesting that their legal and regulatory polices create barriers and limit opportunity for the adoption and practice of telemedicine. 21 states have telemedicine parity laws for private insurance but only 15 of them allow for statewide coverage without restrictions. 29 states have no parity laws to compel private insurers to cover telemedicine services. 47 state Medicaid programs provide some form of telemedicine coverage. Only five of these programs offer comprehensive coverage.

If a provider offers services to a patient located in a place for they do not possess a license may be considered as practicing without a license and subject to disciplinary action, and financial consequences may not be covered by their regular malpractice insurance (Torous, Keshavan and Gutheil, 2014).
Health Insurance Portability and Accountability Act (1996)

As with all healthcare services, any services delivered using telemedicine applications are subject to regulation by the Health Information and Portability Act (HIPAA). HIPAA was established in 1996 to encourage health insurance reform, protect confidentiality and security of personal information, and streamline healthcare administration. Five major titles address the following: 1) health care access, portability, and renewability 2) preventing healthcare fraud and abuse; administration simplification; medical liability reform 3) tax-related health provisions governing medical savings accounts 4) application and enforcement of group health insurance requirements 5) revenue offset governing tax deductions for employers. (California Department of Health Care Services, n.d.). The first and second titles are the most significant. Title I regulates availability and coverage of health insurance by ensuring individuals can keep their insurance even if they lose or change employment and restricting health plans from requiring pre-existing conditions on individuals who switch health plans Title II establishes standards for receiving, transmitting, and maintaining protected health information through the Privacy and Security Rules (Tennessee Department of Health, n.d.). The Privacy Rule outlines who is covered, what information is protected, and how such information can be used (US DHH , 2003). The Security Rule operationalizes the Privacy Rule by defining specific required administrative, physical and technical safeguards for health information. Required administrative safeguards include information access management, workforce training and management and evaluation. In other words, covered entities must only grant appropriate access to PHI,
train employees in security policies and procedures, and perform periodic assessment of their security practices. Required physical safeguards include facility and workspace access, control, and security. Covered entities must control who has access to the information and how the information is accessed. Required technical safeguards involve access, audit, integrity, and transmission controls (US DHHS, 2003).

*Health Information Technology for Economics and Clinical Health Act (2009).*

The Health information Technology for Economics and Clinical Health (HITECH) Act was enacted in 2009 as part of the American Recovery and Reinvestment Act (ARRA). It was designed to encourage meaningful use of health information technologies (DHHS, n.d.). Any use of telepsychiatry must also comply with these regulations.

*Affordable Care Act*

The Affordable Care Act (2009) provides incentives to promote adoption of integrated healthcare models like primary care medical homes and accountable care organizations designed to improve healthcare outcomes and increase deficiency, especially through team-based collaborative care and better communication (U.S. DHHS, 2013)
TELEPSYCHIATRY AND ACCESS TO MENTAL HEALTH CARE

In 2010, Americans received only 70% of recommended healthcare services they needed to treat or prevent or medical conditions (AHRQ, 2014). And in 2011, 26% of Americans reported barriers that restricted access to care, up from 24.0% in 2002 (AHRQ, 2014). In 2012, 34.1 million adults received mental health treatment or counseling while 11.5 million adults reported an unmet need for mental health services, 5.4 million of which received no mental health services (SAMHSHA, 2013). National Survey of Children's Health (NSCH) showed that roughly half of children with emotional, developmental, or behavioral conditions received recommended mental health services (AHRQ, 2014). However, recent research suggests that mental health service utilization among children is increasing (Pfunther et al., 2013).

Top reported reasons for not seeking or receiving treatment have included cost, perceived ability to handle the issue without treatment, lack of knowledge about where to seek treatment, and lack of time (SAMHSHA, 2013). Other reported barriers to quality mental health care include cost of care discrimination and bias, negative attitudes towards mental health issues, fragmented organization of services, mistrust of providers, limited availability of skilled providers in rural areas, lack of culturally and linguistically competent services, lack of a usual source of care, and patient perceptions of need (AHRQ, 2014)

Telepsychiatry has the potential to lower such barriers and increase access to mental healthcare. The following discussion will use the previously examined findings as
well as some additional research to show how telemental health can improve access to mental health services.

ACCESS

The Institute of Medicine (IOM) defines access to healthcare as the “timely use of personal health services to achieve the best health outcomes” (IOM, 1993 as cited in AHRQ, 2014). Although this definition seems simple, access is actually a complicated subject that involves financial, social and organizational factors that relate to both “having” and “gaining” access to high quality care. The former “having” access refers primarily to availability of relevant resources while the latter “gaining” refers primarily to the ability to utilize services or actual utilization of those services (Gulliford et al., 2002). Most papers use the term access arbitrarily to imply both “having” and “gaining” access (i.e., availability and utilization). Measures of access (e.g., resources, patient perceptions of access and past utilization data) and commonly discussed factors influencing access (e.g., time, insurance coverage, attitudes about mental health, cultural incompatibility, etc.) reflect both the availability and utilization of services.

Achievement of the “best outcomes” depends on not only the availability and utilization of care, but also the quality of that care. Quality of care can be described abstractly, by quality indicators and measures, or more moderately in terms of conceptual components (Mitchell, 2008). The World Health Organization (WHO) suggests that quality care is effective, efficient, accessible, acceptable/patient centered, equitable and safe (World Health Organization, 2006).
BARRIERS TO THE AVAILABILITY, UTILIZATION AND QUALITY OF MENTAL HEALTH SERVICES

In order to consider how and why it is that individuals either cannot or do not receive recommended mental health services, a complex matrix of financial, social, and organizational issues at the patient, provider, and institutional levels must be considered. Financial, social, and organizational issues at the patient, provider and institutional levels influence the availability, utilization and quality of mental health services. The cost of receiving and providing mental health services makes patients less likely to seek care and providers less likely to offer it. Negative attitudes about mental illness and its treatment can affect whether patients seek treatment, whether providers offer or recommend treatment, and how well actual treatment goes. Mismatches between patient characteristics and provider resources can affect whether individuals can or do receive appropriate treatment.

Financial Barriers

Healthcare is expensive to receive and expensive to provide: the cost of healthcare is increasing faster than income, inflation, and economic growth. (National Healthcare Disparities Report, 2013).

Patients often cite cost as a barrier to seeking treatment (AHRQ, 2014). High insurance premiums and out-of-pocket payments can be a significant barrier to accessing needed medical treatment and preventive care (Alexander et al., 2003). In 2011, 17.5% of people under the age of 65 had health insurance or medical expenses that were more than 10% of the total family income (AHRQ, 2014). This immense burden of cost could
mean that even if high quality services are available to patients, high cost can prevent actual utilization of those services.

Providers and healthcare institutions are unlikely to establish or provide mental health services if they lack financial support. If patients cannot pay or services otherwise too costly to offer, those services will not be made available. Cost barriers for providers and institutions include, but are not limited to, funding for equipment, deficiencies in billing codes, teleconsultants, and high turnover rates for rural healthcare providers (Weinstein et al., 2014).

Social Barriers

A number of social factors can affect whether people can or do receive effective treatment for mental illness. Patient beliefs about the acceptability and efficacy of treatment or their perceived need for treatment can influence the likelihood that they will seek treatment. If they do seek treatment, these beliefs about mental illness and treatment could affect the clinical outcomes. Similarly, provider attitudes toward mental health in general, their beliefs about the efficacy of treatment, or their comfort level/familiarity/skill with mental illness and specific treatments could influence whether and how well they treat patients.

Language differences between patient and provider are typically associated with less positive clinical outcomes including compromised care; disparities in inequality, dissatisfaction, and inefficiency. Language, however, can improve outcomes including quality of care, patient safety, satisfaction and efficiency (MSN, Lanza, Rodriguez, & Chang, 2011).
**Organizational Barriers**

Organizational considerations like the prevalence and geographic distribution of mental illness, number and distribution of providers, models of care, and legal or regulatory issues can influence access as well.

**Supply-Demand Mismatch**

Mental illness resources are scarce and unevenly distributed, between countries, regions, and local communities (Saxena, Thornicroft, Knapp, & Whiteford, 2007). There tend to be more providers in wealthy, urban areas than in poorer, rural areas (with some exceptions). Furthermore, need for mental health services tends to vary inversely with access: populations with the highest prevalence of mental illness tend to have the worst access to necessary services.

According to the US Department of Health and Human Services (2013), aging, population growth, and expansion of insurance coverage will contribute to an increased demand for primary care physicians that will quickly outstrip supply. Their results suggest a 20,400-physician shortage by July 2020 unless primary care delivery methods change. Nurse practitioners and physician's assistants are expected to grow faster than physicians and could reduce the need for PCPs to 6,400 by 2020. There are currently 6,100 designated primary care health professional shortage areas (HPSAs) based on a ratio of 1:3500 physician-to-population ratios. However, this figure does not take into account primary care services provided by non-physician providers like physician assistants and nurses. Furthermore, there are currently approximately 4,000 mental health professional shortage areas based on a psychiatrist population ratio of 1:30,000 (US
Two-thirds of PCPs report that their communities lack specialized mental health treatment (Cunningham PH, 2009 as cited in Garfield, 2011). Half of rural hospitals report insufficient specialized mental health services (Macdowell, Glasser & Fitts et al., 2010 as cited in Garfield, 2011).

Models of Care

Research suggests that collaborative and integrative care produce better clinical outcomes than traditional referral or replacement models. However, most people seeking mental health care do so in a primary care setting and most primary care offices still lack specialized mental health care services.
TELEPSYCHIATRY

By eliminating the need for co-location, telepsychiatry can offer unique advantages over traditional in-person care. Telepsychiatry has the potential to increase the availability, utilization and quality of mental health services.

Although cost studies addressing telepsychiatry have yield mixed results, there is still the potential for videoconferencing to reduce costs of receiving and providing mental health services. Consequently, anything that can reduce the costs associated with receiving and providing mental health care could influence availability, utilization and quality of services. Providers may be more likely to offer telepsychiatric services and patients may be more likely to utilize the services made available to them if costs were reduced. As technology costs continue to decrease (Doolittle, Spaulding, & Williams, 2011), and electronic health systems become more widespread the cost of receiving and providing mental health services is likely to decrease.

Telepsychiatry can reduce costs to patients and providers by eliminating travel. If patients can see a mental health care provider from their home or their local primary care office they could save both time and money on travel. If providers could treat patient located in remote or otherwise hard-to-access areas from their usual office, they could save time and money on travel. With the time and money they save on travel they may be able to see more patients or engage in other important professional activities.

As Saeed, Diamond and Bloch (2011) observed, telepsychiatry in emergency settings can significantly reduce the number and length of inpatient hospital stays. And while hospitalization may only account for a portion of total mental health,
hospitalizations are expensive and reducing their number or duration even slightly could be financially beneficial. In their analysis of telemedicine in Florida, the Florida Tax Watch estimated that even a 1% reduction in emergency room use and length of hospitalization could save the state 1 billion dollars (Florida Tax Watch, 2014).

Although telepsychiatry is unlikely to change patient’s basic attitudes toward mental illness and mental healthcare, the unique delivery method may help patients seek care in spite of such attitudes. Patients may feel more comfortable meeting with a mental health care provider if they can do it from home or their PCPs office. Videoconferencing from home or a PCPs office may decrease the likelihood that patients run into others from their community and/or strengthen the association between mental and physical health (a potentially positive relationship since most people are more willing to seek treatment for physical ailments). They may also feel more comfortable meeting with a provider outside their community. For example, a psychiatrist may want to seek mental healthcare from a non-colleague provider in a different location. Some research has in fact supported the potential positive effects of the increased psychological and physical distance allowed for by videoconferencing.

Telepsychiatry is also unlikely to change providers’ attitudes, but it can be used to educate and increase familiarity or comfort with mental illness and its treatment and increase the likelihood that providers offer mental health care services. Providers could participate in online courses and training sessions that they might otherwise avoid due to travel time. And the flexibility offered by telepsychiatry may encourage more providers to explore videoconferencing as a delivery tool.
Telepsychiatry can help resolve language and cultural mismatches by connecting patients with providers who speak their native language or are otherwise familiar with their culture without the need for colocation. However, it is worth noting that in some cultures, where personal relationships are emphasized, telepsychiatry may be considered a barrier to connection and could affect the therapeutic alliance.

While telepsychiatry cannot increase the number of providers, it can increase the number of patients who receive treatment by facilitating implementation stepped care integrated care. Web-based self-help programs can help deliver lower level therapy to many individuals. Telepsychiatry can make integrated and collaborative care easier. Even though integrated care produces better clinical outcomes, mental and physical health are still largely considered independently. Patients can receive high quality mental health care within a primary care setting without the mental health provider actually being there. Providers can collaborate more easily with each other too.
CONCLUSION

In summary, the research presented here shows the following: 1) telemental health can be used to effectively diagnose and treat a variety of mental illnesses in a number of populations in many locations; 2) telepsychiatry has the potential to be a cost effective alternative to treatment as usual for patients, providers, and communities; 3) telemental health can function successfully within the legal and regulatory landscape in United States; 4) the technology for telemental health is already available and continually improving; and 5) there are resources available to facilitate the use of telemental health by patients, providers and healthcare organizations.

Telepsychiatry has the potential to improve the availability, utilization and quality mental health services through 1) connecting patients with the right providers, 2) reducing the cost of receiving and providing care, 3) lowering barriers that prevent patients from seeking or providers from offering care and 4) facilitating organizational practices and goals.
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Education

Boston University School of Medicine, MS in Medical Sciences expected May 2015, GPA: 2.9
Harvard Extension School, Summer 2008 and 2012-2013 GPA: 3.53
University of Maine, 2010-2011 and 2014 GPA: 3.9
Bowdoin College, Psychology B.A. May 2010, GPA: 3.1

Relevant coursework:

Graduate
• Biochemistry, physiology, pathophysiology, histology and statistics

Undergraduate
• Biochemistry, biology, microbiology, organic and inorganic chemistry, physics, nutrition
• Psychology: labs in cognition and child development, organizational behavior seminar
  psychology seminars on organizational behavior and philosophy/psychotherapy

Substantial papers
• Master’s thesis addressing telepsychiatry (in progress); critical analysis of Dialectical
  Behavioral Therapy

Competence with:
• Research design and execution: systematic use of scientific method, logic of causal
  analysis, validity, ethics
• Data collection and analysis, quantitative and qualitative, use of SPSS and Excel
• Technical report writing (including APA style)

Relevant Work Experience

Teacher’s Assistant and Study Group Facilitator for Psychology 101, 2009-10
• Attended lectures, collaborated with professor and other tutors about material.
• Conducted weekly tutoring sessions; reviewed relevant literature and developed practice
  materials.
• Graded and proctored exams.

Intern at Substance Abuse Treatment Center of Catholic Charities Maine, Summer 2009
• Observed the intake process, individual and group counseling sessions, and federal and
  state drug court.
• Developed and administered questionnaires about individuals’ experiences with the organization, interviewed clients and employees/volunteers, and composed a written statement of mission and impact for a community award nomination.
• Updated website structure and content to improve intuitive presentation.

**Leadership and Group Experience**

Bowdoin Outing Club Leader, 2007-10
• Completed Leadership Training Semester and guided wilderness and community service trips.
• Managed Trip Planning: permit application, food preparation, gear assembly, itinerary development, transportation coordination, anticipation of hazards, establishment of emergency procedures.

Alford Lake Camp for Girls, Counselor, Outdoor Skills Instructor and Wilderness Trip Leader, 2007

**Other**

EMT Basic and National Outdoor Leadership School, Alumna