Lessons Learned through Review of Telemedicine Research in Mental Health

By

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Abstract

This paper will serve as a systematic review in investigating the question of whether telemedicine services can resolve the growing global burden of mental illness. Based on disability-adjusted life years (DALYs), unipolar major depression is projected to become the leading cause of disability in the world by 2030 (WHO, 2008). Regrettably, depression is seen nearly 3 to 5 times more often in those persons diagnosed with post-traumatic stress disorder (Kessler et al, 1995). In the setting of natural disaster, terrorism and war-related violence, both diseases must be addressed as a source of increasing concern for every global citizen. In addition to this analysis, discussion and recommendations on further areas of research will be provided.

Through a computerized literature search of telepsychiatry across either geopolitical borders or cultural divides in the past ten years, 142 articles were identified. Of those 142 articles, 5 articles met the eligibility criteria of having been screened under the gold-standard diagnostic criteria of either the Diagnostic and Statistical Manual of Mental Disorders (“DSM-IV”) or International Statistical Classification of Disease and Related Health Problems (“ICD-10”).

The major flaw of this review was the low statistical power based on the limited amount of research which adhered to gold-standard diagnostic criteria. Along with the 5 articles selected, 33% of the original 142 articles published in the last ten years were also within the past 2 years. Of the 5 articles which met criteria, none were conducted across national borders.

In conclusion, future research is needed in the area of cross-border telepsychiatry, specifically in the area of transnational clinical management. In the interim, future systematic reviews may need to include studies of non-DSM/ICD depression and PTSD in order to increase statistical power until more formal psychiatric research is conducted.
Introduction

Recent advancements in information and communication technology have allowed the structural equipment involved in telemedicine to become more affordable and, thereby, more accessible to both clinical providers and the general public. In the setting of rising health care costs and increased patient expectations, telemedicine services provide an excellent source for an alternative mode of health care delivery (Mair & Whitten, 2000). Since diagnostic evaluation and therapeutic management of mental disorders are mainly obtained through audio and visual means, psychiatry and psychological counseling are particularly well-suited for utilization of telemedicine (Wootton et al. 2003). Evidence has shown visual-based diagnostic batteries, such as the Abnormal Involuntary Movement Scale (AIMS), performed through videoconferencing possess the same degree of reliability than evaluations conducted by direct observations (Amarendran et al, 2011; Hubble et al, 1993). Just within the past few years, psychiatry’s use of telecommunications has begun a transition from the clinically supervised settings of hospitals and health maintenance organizations to the clinically unsupervised setting of private practice offices (Shore, 2013).

With this ever growing shift in utilization, a comprehensive analysis of the barriers that limit telepsychiatry as an effective health delivery system is needed to better understand the necessary strategies which must be implemented to ensure its success. In addition to providing relevant background information, this paper will attempt to address the implications of transnational telepsychiatry by systematically reviewing transcultural and cross-state border research articles on the management of both the most prevalent mental disorder, unipolar depression, and the condition most likely to be associated with extreme stressors, post-traumatic
stress disorder. By highlighting significant studies, deductions drawn can facilitate proactive change through implementation of concluded recommendations.

**Background**

As outlined in Dr Vikram Patel’s recent article in the Harvard Review of Psychiatry, the core agenda of global mental health is to scale up services for people with mental disorders and promote their human rights. The World Health Organization has attempted to address this challenge by instituting international and region-specific guidelines of management through the actions of mhGAP, the Mental Health Gap Action Programme.

In the 2004 update of the World Health Organization’s Global Burden of Disease (GBD) Report, neuropsychiatric disorders were found to account for over one third of years lived with disability (YLD) among adults aged 15 years or older (WHO, 2008). Based on disability-adjusted life years (DALYs), unipolar major depression is projected to become the leading cause of disability in the world by 2030 (WHO, 2008). Depression is particularly debilitating due to its high prevalence, impact on functionality and early age of onset (Ustun, Ayuso-Mateo, Chatterji, Mathers & Murray, 2004). Depression is seen nearly 3 to 5 times more often in those persons diagnosed with post-traumatic stress disorder [PTSD] (Kessler et al, 1995). This finding is most unfortunate due to the historically difficult nature in assessing PTSD within a global context. Fortunately, recent research has provided several concise diagnostic instruments to increase its usage as a screening device; such as The Trauma Screening Questionnaire (abridged version of the PTSD Symptom Scale) and PTSD-8 (abridged version of the Harvard Trauma Questionnaire) (Brewin et al, 2002; Foa, Cashman, Jaycox & Perry, 1997; Hansen et al, 2010; Mollica et al, 1992). Although DALY rates of PTSD is dwarfed when compared to unipolar depression in the
2004 revision of the WHO Global Burden of Disease report, clinical utilization of these previously mentioned abridged assessment tools did not exist prior to this latest WHO study. Therefore, we are not currently in possession of an accurate epidemiological picture of PTSD. However, in the setting of natural disaster, terrorism and war-related violence; both major depression and post-traumatic stress disorder must be addressed as a source of increasing concern for each and every citizen within our global community.

Unfortunately, disparities within quality and access of healthcare exist along the developmental spectrum of nation-state populations. For example, World Health Organization reports that its European region has 200 times as many psychiatrists as seen in Africa (WHO, 2011). Therefore, in May 2012, the 65th World Health Assembly adopted a resolution which seeks to draft a coordinated response to address the global burden of mental disorders (http://apps.who.int/gb/ebwha/pdf_files/EB132/B132_8-en.pdf). The comprehensive mental health action plan drafts six cross-cutting principles; universal access and coverage, human rights, evidence-based practice, life-course approach, multisectoral approach and empowerment of persons with mental disorders and psychosocial disabilities. The main objectives outlined in the plan were to strengthen effective leadership, provide integrated responsiveness, implement promotional and preventative strategies as well as strengthen evidence and research. In targeting the disparity of access, the WHO plan specifically sets the goal of reducing the treatment and service gap for mental health by 20% by the year 2020. Based on their data, 85% of the world’s population of six billion people live in low- and middle-income countries. In fact, the majority of countries in South-East Asia and Africa spend less than 1% of their health care budget on addressing mental health (WHO, 2007). With depression projected to become the leading cause
of global disability by the year 2030, the urgency in confronting limited access to mental health care is becoming necessity.

Health care technology can help address the inequity of mental health service delivery. In 1994, South Australia’s Rural and Remote Mental Health Service (RRMHS) became one of the first large-scale programs to establish a model to provide psychiatric care via telecommunications. Within its first four years of operation, RRMHS offered over 2,000 clinical consultations, which included emergency services, inpatient liaison and post-discharge follow-up (Freuh et al, 2000). Today, there are multiple examples of case reports researching the use of telepsychiatry in countries outside of the United States. However, there are much fewer studies and projects which highlight clinical psychiatric management across borders. Within the United States, the Federation of State Medical Boards has released a legislative review of each state’s policy on practicing cross-border telemedicine. Based on the most recent 2012 edition, ten out of the fifty states allow physicians to practice across state lines with use of telemedicine. The World Health Organization (WHO) released the results from their Global eHealth Survey, which provides a more accurate understanding of the global climate. In addition to this survey, the WHO also released a report titled “Building Foundations for eHealth” (2007), which provides a framework for both governmental and non-governmental agencies to pursue resources available for cross-border telemedicine.

Currently, there is limited data on the dynamics of cross-border telepsychiatry. Therefore, abstractions based on results from telepsychiatry studies which conducted research across state borders as well as across cultural divides are needed to determine strategies to future implementation of successful programs.
Methods

Literature Search

Computerized literature searches were performed in MEDLINE to identify clinical trials as well as case and cohort studies published from March 2003 through February 2013. The search criteria for combined search terms regarding telepsychiatry (telepsychiatry, telemedicine, telecommunication, eHealth, mobile health, telehealth, telemental*, teleconferenc* or videoconferenc*) with global health (global health, world health, international health, ethnopsychiatr*, cultural psychiatry, transcultural psychiatry or trans-cultural psychiatry) and either depression (depressi*, MDD or melancholia) or post-traumatic stress disorder (post-traumatic stress, posttraumatic stress disorder*, traumatic stress disorder*, combat disorder*, combat stress disorder*, combat neurosis, combat neuroses, war neurosis, war neuroses, shell shock or PTSD). Associated search terms were chosen based on already associated Medical Subject Headings [MeSH] terms listed through the MEDLINE database. All terms were searched in both titles and abstracts.

Eligibility Criteria

Evidence included in this review was selected based on the following criteria: (1) design: usage of videoconference for management of post-traumatic stress disorder and/or major unipolar depression; (2) intervention: direct patient management; (3) outcomes: clinical evaluations and/or surveys. Exclusion criteria consisted of telemedicine research not based in both audio and visual real-time interaction as well as studies with cohorts who are under the age of 18.
To be included, articles must describe research on the mental disorders of either major unipolar depression or traumatic stress. Research conducted by American investigators must include cohorts who meet criteria set forth by the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (“DSM-IV”). Therefore, use of the Structured Clinical Interview for DSM-IV (“SCID”) and other assessment tools based on DSM-IV criteria were allowed as part of the inclusion criteria for this review. Research published in non-American journals must include cohorts who meet criteria set forth by either the tenth revision of the International Statistical Classification of Disease and Related Health Problems (“ICD-10”) or the DSM-IV. Therefore, the use of the Mini International Neuropsychiatric Interview (“MINI”) and other assessment tools based on ICD-10 criteria were allowed as part of the inclusion criteria for this review as well. Articles with participant cohorts who had not been diagnosed by either the DSM-IV or ICD-10 criteria were excluded from the study.

Selected articles on cross-border telepsychiatry must include research on clinical management conducted amongst participant cohorts across geopolitical and/or cultural borders. International investigators conducting telemedicine research within their same nation-state were excluded from the study.

Quality Assessment

Quality of selected articles is based on methodological criteria set by the National Health and Medical Research Council to assess the effectiveness of interventions. The highest level of evidence [Level I] is a systematic review of randomized controlled trials (RCTs), which are the next highest level of evidence [Level II]. Aside from systematic reviews and RCTs, pseudo-randomized controlled trial [Level III-1] as well as comparative studies with [Level III-2] and
without [Level III-3] concurrent controls are the next highest levels of evidence. The lowest level [Level IV] are case studies.

Other measurements of quality, include (1) directness: evidence based directly in global cross-border telepsychiatry research was given a higher priority than research based in either domestic telepsychiatry or non-specific global telemedicine; (2) year of publication: more recent evidence is more likely to have used information and communication technology more akin to current standards; (3) sample size: larger cohort samples decrease likelihood of error within outcomes.

Results

One hundred and forty two articles resulted from preliminary search, see Figure 1.

Five Articles remained after application of eligibility criteria, see Figure 1.

Treatment Completion and Outcome and Comparison to Treatment Delivered in Person. Behavioral Therapy. 42, 276-283.

- In this cohort study with controls, 89 combat veterans diagnosed with PTSD had 12 sessions of exposure therapy either by real-time videoconference across state lines or in person.

  - In this cohort study with controls, 120 Chinese Americans with expressed language preference of either Mandarin or Cantonese who were diagnosed with MDD received initial assessment either by real-time videoconference or in person.

  - In this cohort study with controls, 147 American Latinos at Community Health Center diagnosed with MDD had monthly psychiatric sessions either by real-time videoconference or in person.

  - In this cohort study, 117 combat veterans diagnosed with PTSD had 8 sessions of exposure therapy either by real-time videoconference across state lines or in person.

In this cohort study with control, 167 American Latinos at Community Health Center diagnosed with MDD had monthly psychiatric sessions either by real-time videoconference or in person.

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<td>PCL-M, BDI-II, DASS</td>
<td>PHQ-9, SDS, VSQ-9, PHQ-9, SDS, VSQ-9</td>
<td>CB-PHQ-9, HAM-D, CGI, QIDS, Q-LES</td>
<td>PCL-M, BDI-II, DASS</td>
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<tr>
<td>Intervention</td>
<td>Monthly Psychiatric Sessions</td>
<td>Exposure Therapy</td>
<td>Monthly Psychiatric Sessions</td>
<td>Serial Psychiatric Sessions</td>
<td>Exposure Therapy</td>
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<tr>
<td>Outcome</td>
<td>No significant statistical difference between telepsychiatry group and controls</td>
<td>Telepsychiatry group showed significant improvement; no comparative control group to measure relative difference within study</td>
<td>No significant statistical difference between telepsychiatry group and controls</td>
<td>Outcomes not yet published, no preliminary discussion of transcultural issues</td>
<td>Exposure Therapy was less effective with Telepsychiatry cohort, no cross-border reflection due to federal facilitation via Dept of Veterans’ Affairs</td>
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**Discussion**

Although the research question focused on the role of cross-border global telepsychiatry, there were very few scholarly articles which actually highlighted research across national
borders. From the articles in which transnational telepsychiatry was conducted, patients had not been adequately diagnosed under DSM-IV or ICD-10 criteria, which is a standard in psychiatric practice. As a result of setting professional diagnostic criteria, only 5 of the 142 articles discovered were chosen for the analysis. Unfortunately, articles selected only showed telepsychiatry research across state borders or cultural borders not national borders. Perhaps, more articles with stronger direct evidence may have been obtained through use of different databases, like PsycINFO or PILOTS [Published International Literature On Traumatic Stress].

Of the five articles within the eligibility criteria, three were filtered as being transcultural and two were filtered as being across state lines. Of those transcultural studies, the articles never specifically identify if the cultural groups are non-American born or raised. This lack of detail affects the quality of the results gained as perception of acculturation can vary based on generational degrees of immigration. First generation immigrants may see more of a cultural divide than a fourth generation immigrant of the same ethnicity. Of the interstate studies, both were conducted under the federal agency of the Department of Veterans Affairs. Therefore, the selected article did not highlight any difficulties in practicing medicine across state borders due to the research being facilitated by a national agency. Due to this fact, no significant information can be abstracted regarding barriers of geopolitical borders.

The major flaw in abstracting from this review is the low statistical power. With future analysis of this topic, excluding non DSM or ICD based studies will be repealed to increase significance in more accurately addressing the topic of cross-border telepsychiatry. Of the 142 articles, many highlighted psychiatric research across national borders and cultural divides. However, virtually all of the articles were excluded due to the DSM and ICD eligibility criteria. In order for us to gain a clearer understanding on the proposing and opposing viewpoint
concerning the issue, another systematic review with less strenuous criteria to draw more accurate abstraction will need to be performed. Another reason why a future review of this content is necessary is secondary to the growing body of evidence; 33% out of the 142 articles published in the past ten years were within the past two years. Due to the ascension of medical technology, communication and collaboration have begun to play a more pivotal role in reduction of global burdens of health. Therefore, telemedicine research will continue to manifest at a faster rate which will result in high statistical power with future systematic reviews.

**Recommendations**

As already noted, the density of psychiatrists within patient population is lower in developing countries (WHO, 2011). Therefore, quality mental health care has grown from local necessity to global commodity. Due to current levels of worldwide burden, developed nations find themselves in a position to provide health care services to other countries in need. Review literature on regulation of global telemedicine continued to present two basic questions; which legal statutes and jurisdiction should be respected in cross-border encounters, and how should health-care professionals register and be monitored across borders (Wootton et al, 2006).

In addressing the first question of jurisdiction, one must ask which nation’s laws should be followed in cross-border telemedicine; are they meant for the citizen or the individual who occupies that territory? As technology develops, definitional issues continue to complicate our traditional understanding of law and ethics. What would happen if our traditional definition of territory were to disappear? Would laws apply to citizens who violated them while not occupying their native soil? Traditionally, the United States has allowed foreign governments to charge offenses against our non-diplomatic citizens unless punishment is seen as too extreme.
Therefore, it appears that both citizenship and political land may play a role in cross-border jurisdiction. However, what if an American clinician was still occupying his or her own native soil while breaking a foreign law (i.e. practicing without a local license)? If another nation wants to punish that clinician, what right does that nation have to pursue an offensive? Does that nation’s law affect the clinician’s alienable rights while he or she is still living in the United States? In whose courtroom will they stand trial? Could a global court pursue charges since virtual no unanimous global policy exist in the realm of telecommunications? Should a global policy for telemedicine exist? Which nation-states would determine the criteria and what entity would provide the enforcement? As you can see, there are many theoretical questions that surround the regulatory complexities within cross-border telemedicine. Based on information collected through this review, there will a growing need for both structure and incentive to assist in furthering research and project implementation of cross-border telemedicine. Although international governmental organizations, like the WHO, traditionally have difficulty in enforcing global policy, a framework is needed to increase effective cross-border clinical utilization of this growing technology. Without a structured framework, improper or unsustainable investments may unknowingly sabotage well-meaning efforts to improve public health. Therefore, a global authority like the World Health Organization would be a prime candidate for structuring future clinical and research recommendations in the growing field of telemedicine.

In order for us to conceptualize these future dilemmas, psychiatrists and other mental health professionals must receive the proper training in telemedicine to provide both education and clinical management. Usage of telepsychiatric services in the United States has expanded to hospitals, academic center, state and federal agencies as well as private practice (Glueck, 2011;
Freuh et al, 2000). For example, the University of Virginia Office of Telemedicine began outreach clinical management and education to improve and promote health in underserved communities since 1994. Today, resident psychiatric physicians are provided training in implementing clinical management as part of their core education. However, technology training is only half of the equation as transcultural competency is greatly needed to ensure a more globalized comprehension of mental disorders. Based on rates and patterns seen in cross-national epidemiologic surveys, we know major depression disorder differs in its presentation among individuals of various cultures (Weissman et al, 1996). Therefore, it is of critical importance that clinical programs incorporate learning objectives that addresses the diverse nature of ethnicity, tradition and customs. It is worth noting that true cultural competency within global mental health has no true end goal. Though the World Health Organization has created the Composite International Diagnositc Interview [CIDI] based on ICD and DSM criteria for transnational and transcultural evaluations, the assessment tool has received some criticism upon review (Kessler and Ustun, 2004). In short, transcultural mental health care remains in its infancy but the growing need to address the global burden of these psychiatric conditions continues to grow.

In conclusion, this topic of cross-border telepsychiatry will need further exploration to ensure proper implementation of its associated transcultural and geopolitical dimensions. A more expansive review based on the discussion provided will follow this paper. Although there is a scarcity of research on the topic, the need for further mental health care in globally underserved area continues to grow. We must understand that there exist both technical and adaptive challenges in the field of health technology. Mental health professionals must continue to educate themselves beyond standard clinical practice in order to address the cultural needs of an increasingly diverse patient population. Mental health professionals should also consider the
pursuit of clinical research based on diagnostic criteria utilized in their practice. If participating in said research is an impractical reality, service providers should remain up to date in current practices and guidelines. If service providers can uphold that level of professional standard, the goal of reducing the treatment and service gap for mental health by 20% by the year 2020 may be an obtainable reality for us all.
References:


