The Utility of Behavioral Telehealth for Isolated Populations

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In this literature review, research pertaining to the use of behavioral telehealth with institutionally and geographically isolated populations is critically evaluated. Behavioral telehealth has been hypothesized as a mechanism by which to bridge gaps that exist in mental health service delivery as a result of isolation; be it institutional (such as military or incarcerated populations) or geographical (in the case of rural populations). Behavioral telehealth has been proposed as having risen from and driven by necessity. However, proponents advocate that cost savings and improved quality of care also act as a driving force in the advancement of behavioral telehealth. Critics cite lack of empirical evidence to support such claims as a primary weakness in the current state of literature on behavioral telehealth, and advocate for research pertaining to comparison of clinical outcomes via face to face and behavioral telehealth mediums. Currently, a movement toward empirical outcome research is underway, as are attempts to establish sound methodology that are notably absent in early literature pertaining to behavioral telehealth.

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THE UTILITY OF BEHAVIORAL TELEHEALTH FOR ISOLATED POPULATIONS
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Abstract

In this literature review, research pertaining to the use of behavioral telehealth with institutionally and geographically isolated populations is critically evaluated. Behavioral telehealth has been hypothesized as a mechanism by which to bridge gaps that exist in mental health service delivery as a result of isolation; be it institutional (such as military or incarcerated populations) or geographical (in the case of rural populations). Behavioral telehealth has been proposed as having risen from and driven by necessity. However, proponents advocate that cost savings and improved quality of care also act as a driving force in the advancement of behavioral telehealth. Critics cite lack of empirical evidence to support such claims as a primary weakness in the current state of literature on behavioral telehealth, and advocate for research pertaining to comparison of clinical outcomes via face to face and behavioral telehealth mediums. Currently, a movement toward empirical outcome research is underway, as are attempts to establish sound methodology that are notably absent in early literature pertaining to behavioral telehealth.
Introduction

Telehealth involves the delivery of health service over a distance; that is, when the provider and client are physically separated (VandenBos & Williams, 2000). However, more specific definitions are varied due to the use of different terms in the literature (e.g., telemedicine, telepsychology, telepsychiatry, telemental health care, and behavioral telehealth) as well as a range of inclusion or exclusion of delivery methods (e.g., telephone, fax, videoconferencing, and the internet).

There is no universal definition of telehealth (Stamm, 2003). The lack of a universal definition is likely due to the rapid growth of the field: As definitions are being established, current technology and the manner in which technology is used to support health care is changing. Stamm (2003) maintained that creating an operational definition of telehealth would be unhelpful for several reasons. First, a general definition may be too vague to be meaningful. Second, a specific definition may rule out future applications of telehealth, thereby limiting the scope of a growing field (Stamm, 2003). The belief of some authors is therefore that most individuals have a general understanding of the concept of telehealth as the provision of services via telecommunications, and that this understanding is sufficient.

However, others (e.g., Mair & Whitten, 2000) reported that failing to provide a conceptual definition of telehealth for mental health may lead to confusion and long-term
repercussions. For instance, in order to evaluate the efficacy of telehealth programs, researchers must be able to standardize evaluation measures in order to enhance validity and generalizability of results. Implicit in this standardization is the idea that researchers must know what constitutes a telehealth network. Currently, programs who believe their needs to be unique frequently develop new measures for evaluation of efficacy thereby limiting establishment of measurement validity (Stamm & Perednia, 2000). According to this argument, establishing a set definition of telehealth may aid in development of measures of efficacy which in turn may serve an important role in gaining funding for telehealth programs.

Most widely referenced in current literature is the definition provided by Nickelson (1996), who described telehealth as “the use of electronic information and communication technologies to provide and support health care when distance separates the participants” (p. 443). The definition is quite broad, encompassing a range of applications including but not limited to direct patient care, training, supervision, consultation, continuing education, and administration. Although researchers often use the terms telehealth and telemedicine interchangeably (Rees & Haythornthwaite, 2004; Stamm & Perednia, 2000) the clearest distinction between the two is that telehealth refers to a broad range of health-care related activities, and telemedicine refers specifically to direct patient care components of telehealth in which patients are able to directly access health care services (Grigsby, 2002; Stamm, 2003).

Further complicating the process of explaining telehealth for mental health care are specialized, field-specific terms including behavioral telehealth, telemental health care, telepsychology, and telepsychiatry. Nickelson (1996) described behavioral
telehealth as the application of telehealth technology to behavioral health care such as clinical, forensic, and educational services, including mental health services such as assessment, diagnosis, intervention, and follow-up care. However, researchers continue to employ a variety of terms when referring to telehealth as it relates to mental health care. For example, telepsychology has been defined as “the provision of psychological services via technology-assisted means” (Rees & Haythornthwaite, 2004, p. 212), seemingly denoting a more specialized use than behavioral telehealth, which is used in reference to a broader range of behavioral health services such as education. Telemental health care is primarily a term used by the military to describe the delivery of mental health care (including medication management and psychotherapy) delivered via videoconferencing (Grady & Melcer, 2005). Telemental health care is therefore a term that is inclusive of both psychological and psychiatric services.

Stamm (2003) reported that mental health care usually appears under the classification of psychiatry, likely leading to the synonymous use of the terms telepsychology and telepsychiatry. The apparent confusion in terms is widespread. In their guidelines for telepsychology, Reese and Haythornthwaite (2004) cited the limited retrieval for articles when using the term telepsychology in a literature search as evidence of a lack of participation in telehealth by the field of psychology. However, a survey of telehealth affiliates performed by Grigsby (2002) indicated that mental health was the most active specialty area from 1996 to 1999.

Grigsby surveyed 486 individuals who were affiliated with telehealth, as indicated by periodical and internet searches. One hundred thirty two individuals responded to the surveys, representing a 27% response rate. However, at the time of the survey only 179 of
the 486 programs were active (as indicated by current or recent service provision). The response rate from active programs was 74%. The study was longitudinal in design, and Grigsby surveyed the individuals annually for 3 years; the final survey yielded a response from 50 of the original participants. The purpose of the survey was to obtain a description of the state of telehealth based on statistical analysis of current activity and distribution. Grigsby reported that the amount of telehealth activity (as defined by programs connected through a combination of communication technology) increased over the span of the survey; from 132 active telehealth programs in 1997 to 179 active telehealth programs in 1999. Additionally, mental health was the most active specialty with 57 networks and 11,974 total teleconsultations reported in 1998, representing an increase from 43 networks and 7,404 teleconsultations reported in 1997. Data for 1999 were recorded for the first quarter only and therefore could not be used as the basis of comparison (Grigsby, 2002). The results of this study indicated that the limited retrieval rate for the term telepsychology reported by Reese and Haythornthwaite (2004) was likely due to the confusion or misuse of terms rather than lack of participation on the part of the field of psychology.

Perhaps the best way to gain an understanding of telehealth is not to define telehealth conceptually, but to look at the current workings of telehealth in order to determine the norms in the field and to come to a conclusion regarding what telehealth is. Standard telehealth networks tend to follow the wheel model: A center such as a hospital or university serves as the “hub” and is connected by some form of telecommunications to a number of smaller networks or clinics which serve as the “spokes” (Nickelson,
In a recent study performed to determine the extent to which psychologists are involved in providing services via telehealth, researchers sought to determine if parsing the use of the telephone out of the definition of telehealth service would make a difference in determining the extent to which current practitioners utilize telehealth. They queried whether the telephone was a “preexisting technology that was already extensively used in professional practice prior to the more recent telehealth initiatives” (VandenBos & Williams, 2000, p. 490). VandenBos and Williams surveyed 1000 doctoral-level practicing psychologists who were members of the American Psychological Association. A total of 596 usable surveys were returned, representing a 60% return rate.

When including the telephone in the definition, 98% of professionals reported providing services via telehealth. The number of professionals utilizing telehealth dropped to 2% when the definition was inclusive of only internet, satellite, and closed-circuit television. The authors suggested that telehealth is best conceptualized as not being inclusive of the telephone despite the fact that the telephone meets the standard criteria for most definitions of mechanisms of telehealth. They suggested instead that professionals should consider the telephone a routine communication device when considering frequency of use for the purpose of telehealth initiatives (VandenBos & Williams, 2000). Based on the conclusions of this study, the authors suggest that norms for delivery of telehealth should be exclusive of the telephone but inclusive of services provided via internet, satellite, and closed-circuit television. However, the authors of recent guidelines set for the delivery of telepsychology reported that provision of services
must be via "technology-assisted means" and is therefore inclusive of the telephone (Rees & Haythornthwaite, 2004). There is currently no clear stance in the field concerning which delivery mechanisms are standard for telehealth.

Selection of term use for this review must be done with caution. To misuse terms or use terms synonymously may exacerbate the current dilemma. Use of the terms telepsychology, telepsychiatry, or telemental health would seemingly denote the delivery of psychological or psychiatric services but would not be inclusive of educational services such as consultation and supervision. Use of broad terms such as telemedicine and telehealth may be interpreted to indicate inclusion of multiple fields, as opposed to sole reference to the field of mental health. Based on review of the available definitions, the term behavioral telehealth will be used in this review. This term is inclusive of direct delivery of psychological services as well as educational uses such as consultation and supervision, and is exclusive of applications outside the field of mental health. When services are inclusive of both psychological and psychiatric services, the term telemental health care will be substituted.

In this literature review, the nature and development of research pertaining to behavioral telehealth was critically evaluated. Research pertaining directly to the use of behavioral telehealth (typically in the form of reports of patient and client satisfaction, as well as cost savings) with institutionally and geographically isolated populations was reviewed, as was research that represented an early attempt to demonstrate efficacy of clinical outcomes for services delivered via behavioral telehealth. The current state of the research was summarized, and recommended directions for future research were provided.
Institutionally Isolated Populations

Telehealth has long been portrayed as a mechanism by which to provide services to both geographically and institutionally isolated populations. However, much of the research available has been carried out with rural populations. Stamm (2003) noted that “Applications of telehealth to rural and underserved communities far outnumber those of other programs” (p. 147). In the United States, the application of behavioral telehealth has advanced most in the public sectors of correctional centers and the Department of Defense (Rees & Stone, 2005). Therefore, the most prevalent institutionally isolated populations addressed in the research are incarcerated populations, and military populations.

Incarcerated Populations

Within the prison system, behavioral telehealth has been hailed as a way to improve quality of care, create a more secure environment for the general population and the prison population, and ease financial strain due to frequent transporting of inmates to and from mental health facilities (Magaletta, Fagar, & Ax, 1998). However, very little research has been done to support such anecdotal claims. Representative of much of the early literature on behavioral telehealth, the literature pertaining to incarcerated populations is largely comprised of demonstration projects, pilot studies, and feasibility trials.

Stamm and Perednia (2000) reported that prior to 1997, most of the literature on telehealth programs consisted of published accounts of practical applications rather than
clinical trials with evaluation components. Data obtained were commonly related to provider or patient satisfaction. Patient care data were typically limited to number and type of consultation rather than change scale or outcome data (Stamm & Perednia, 2000).

In their recent account of a pilot project conducted by the Federal Bureau of Prisons, Magaletta et al. (1998) reported that transportation of inmates to mental health facilities ranges in cost from $5,000 to $10,000 per trip. Trips create a financial strain for the prison system as well as a safety threat to the community at large. In addition, Magaletta and his colleagues (1998) reported that many of the Bureau of Prisons institutions are geographically isolated, leading to difficulty in finding mental health providers who will provide services in a timely manner. The authors suggested that behavioral telehealth therefore enhanced the security of the community because inmates were not being moved throughout the community. Additionally, they proposed that behavioral telehealth eased the financial strain that resulted from staffing guards to escort the inmates, and increased quality of care because inmates did not have to wait for services. Data to support any of the hypotheses were not provided. Instead, the data gathered during the pilot project were limited to number and type of consultation, and diagnosis given. The data were later used in a follow-up study that addressed inmate acceptance of telehealth, addressed later in this paper.

Although the proposal of hypotheses for the pilot project was a representative strength, an apparent weakness was the lack of data to support the hypotheses. The pilot project was not carried out in a traditional, empirical manner. The presentation of the pilot project is consistent with a trend noted by Stamm (2003), who reported that "Breaking with tradition, telehealth emanated not from efficacy studies, or even
effectiveness research, but from grassroots applications...Certainly there are efficacy studies and clinical trials in process, but real-world effectiveness continues to be a cornerstone of telehealth research” (p. 147).

In a similar study, Manfredi, Shupe, and Batki (2005) sought to determine the feasibility of implementing a telemental health care system in a rural jail in order to increase access to mental health services, specifically psychiatric services. Participants were 15 incarcerated inmates who had been screened by social workers through the local mental health clinic for mental health concerns. Prior to the session the social worker faxed a referral to the psychiatrist and then introduced the inmate to the psychiatrist via video conferencing. The social worker then left the room and the session proceeded to cover areas of diagnosis, treatment planning, and implementation and follow-up of medication.

Consistent with earlier observations of limited data collection (Stamm & Perednia, 2000), data from the pilot study were limited to number and type of consultation, as well as diagnosis given. The researchers cited anecdotal evidence of a high level of acceptance of the system by the inmates and staff, but the citations were not supported by any data. The researchers reported that utilization of behavioral telehealth for provision of mental health services to inmates incarcerated in the county jail was feasible, citing the main benefit to the jail as a reduced need for inmate transport that led to cost savings. However, no data were provided to demonstrate the savings. Additionally, no outcome measures were utilized to determine change in symptomology of the inmates seen via telehealth. The researchers advised outcome research, as well as research on cost-effectiveness (Manfredi et al., 2005).
Magaletta, Fagen, and Peyrot (2000) described a project carried out with the Federal Bureau of Prisons in which they sought to determine inmates' perceptions of telemental health care. The study utilized the hub and wheel model proposed by Nickelson (1996). The hub site was the Federal Medical Center in Lexington, Kentucky, which was connected to two remote correctional sites: The U.S. Penitentiary in Lewisburg, Pennsylvania, and the U.S. Penitentiary in Allenwood, Pennsylvania. The telehealth consultations were 10-30 minutes long with the primary purpose being medical management of the inmates. Parties present at the connection site included the inmate, the referring psychologist, and a telehealth coordinator (an individual in charge of operating the telehealth equipment). Parties present at the hub site included the consulting psychiatrist and a telehealth coordinator.

A six-item questionnaire was designed by psychologists at the U.S. Penitentiary in Allenwood, PA to assess inmates' perceptions of the telehealth system. The questionnaire was scored on a 7-point Likert scale. Participants were 75 inmates whom consulting psychologists had deemed to have psychiatric need and were subsequently referred to receive services via telehealth. A majority of inmates rated their treatment via telehealth positively (81%) and responded that they would return to see a doctor via telehealth technology (83%). Seventy-three percent of respondents indicated that they would recommend telehealth to other inmates. Of inmates who had received psychological services outside the prison (n = 57) 46% reported that the service via telehealth technology was comparable to services provided face-to-face. Of the remaining 54% of inmates who had received psychological services outside the prison, 35% reported that the treatment was better and only 19% reported that the treatment was
worse. Although the questionnaire was simple in design, response to the questions demonstrated that acceptance of telehealth was relatively high among inmates.

In addition to data gathered from the questionnaire, several observational reports were made by the psychologists at the prison regarding inmates who refused to attend sessions via telehealth. Eleven inmates reported that they did not want any consultation with a psychiatrist regardless of the means by which the consultation occurred (face-to-face or via telehealth). Two inmates reported that they were angry with the telehealth psychiatrist and did not want to return for a second session. Six inmates refused to attend because of the telehealth medium. Of the six who refused to attend, two were suspicious that the government would record the session for use against them. One inmate refused to return after having a nightmare about the psychiatrist chasing him with a video camera.

Additional observational reports were related to working with individuals with thought disorders. One inmate reportedly maintained a delusion that his television “talked” to him and reported after his telehealth consultation: “See, I told you the television talks to me!” (Mageletta et al., 2000, p. 500). The researchers reported that the telehealth medium may have reinforced his delusion. Another inmate with a diagnosis of schizophrenia saw his picture on the screen because the telehealth consultations had utilized a “picture in picture” visual in which the consulting party sees both a large image of the psychiatrist as well as a small image of him or herself in the corner. The inmate reportedly believed that his image was his “imposter” (Mageletta et al., 2000, p. 500).

Such observations may serve a function in creating exclusionary criteria for the use of telehealth, or in offering guidelines for utilizing telehealth technology with specific populations such as clients who have thought disorders. As such, these observations may
be as valuable to researchers as any data that could be gathered in a more traditional, empirical manner.

In sum, current literature pertaining to the implementation of telehealth programs for use with incarcerated populations are largely comprised of feasibility or pilot studies and are lacking in outcomes. However, anecdotal reports of user acceptance and cost savings are consistent across the current literature, as are conclusions that more research is needed to assess the efficacy of treatment via telehealth and cost efficiency. Additionally, anecdotal observations may serve to direct future research and to establish exclusionary criteria or guidelines for the usage of behavioral telehealth with special populations. Currently, research is underway to determine the validity and reliability of telehealth interviewing; to determine inmate, psychiatrist, and prison staff satisfaction with telehealth; and to examine the cost savings that result from implementing a telehealth system in prisons (Leonard, 2004).

**Military Populations**

Behavioral telehealth has been utilized as a solution to providing mental health services when distance separates military personnel from mental health providers as a result of living in remote areas (military bases) or military deployment (Grady & Melcer, 2005; James, Folen, & Earles, 2001). Military researchers appear to have followed traditional researching methods with less reliance on demonstration projects and observational data.

James et al. (2001) recently evaluated the treatment outcomes of cognitive-behavioral interventions for the treatment of obesity among military populations when services were provided in a clinic or via telehealth. Participants were 48 military
personnel who had volunteered for the study. Participants were all diagnosed as overweight based on military standards, with a body mass index (BMI) of at least 27. Participants were at risk of involuntary discharge from their service as a result of inability to maintain weight standards. All participants completed a 3-week day-treatment program at the Army Medical Center in Hawaii. Thirty-four participants attended weekly follow-up at the Army Medical Center. Fourteen participants had been deployed to ship assignment and therefore were placed in the behavioral telehealth (interactive video and Web-page) group.

Both groups were required to report their weight, fat grams consumed, caloric intake, resting heart rate, blood pressure, and side effects such as lightheadedness or cramps. Participants were monitored for exercise compliance, and received nutritional guidance and behavioral-modification intervention from personnel at Tripler Army Medical Center. The content of behavioral-modification interventions was not described in the study. Participants at the Army Medical Center attended sessions that ranged from ½ hour to 1 hour at the hospital. Participants in the behavioral telehealth group attended weekly interactive video teleconferencing sessions with the Army Medical Center.

Analysis of data revealed that the groups differed significantly in age and gender. The average age of the behavioral telehealth group was 27, whereas the average age for the clinic group was 31. The behavioral telehealth group was comprised of 14% women, whereas the clinic group was comprised of 44% women. However, there was no significant difference in actual weight loss based on sex or age. At the end of the 3-week treatment at the Army Medical Center, the behavioral telehealth group had a significantly lower average BMI ($M = 29.8$) than did the clinic group ($M = 31, p < .05$).
The difference was not evident at the 3-month follow-up, indicating that the behavioral telehealth group did not continue to decrease BMI at the same rate that the clinic group did, but rather that the clinic-based group “caught up” to the behavioral telehealth group. The clinic-based group experienced greater decrease in BMI than the behavioral telehealth group during the time of follow-up sessions.

The study did not have a randomized control group due to the nature of the sample. The participants were active duty military personnel, and the researchers could not control who would be deployed and who would not. Additionally, a control group would not have been ethical in the study. Participants were at risk of being discharged due to their weight and to place them into a control group would have posed an ethical dilemma for the researchers. Due to the methodological limitations of small sample size, lack of a control group, and lack of random assignment to groups, results are likely not generalizable. However, results indicate that the behavioral telehealth group did not continue to lose weight at the same rate that the clinic-based group did. A feasible reason may be that the personnel knew that they would be deployed and therefore worked harder in the initial 3-week day-treatment program than did personnel who remained on the base. The researchers concluded that behavioral telehealth programs “offer promise” (James et al., 2001, p. 184); however, it appears that more research needs to be carried out in order to determine if treatment gains differ consistently when treatment is provided face-to-face or via behavioral telehealth. Further research is needed to determine the efficacy of behavioral telehealth for the treatment of obesity in civilian populations to determine if treatment gains differ, and to enhance generalizability.

In a retrospective study of military records, Grady and Melcer (2005) sought to
address the question of whether treatment outcomes differ between groups of remote military populations when care is provided face-to-face or via videoconferencing. Study participants were active duty and retired military personnel and their adult family members who had been diagnosed according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV, American Psychiatric Association, 1994) criteria. One group received treatment face-to-face (FTF), while the other received services via telemental health (TMH).

Initial evaluations were 90 minutes each, and follow-up sessions were 30 minutes each. Appointments consisted of medication management with psychotherapy that was eclectic in nature, including psychoeducation, cognitive-behavioral, insight-oriented, and feminist therapies. The FTF clinic was staffed with two licensed clinical psychologists and one licensed social worker. The TMH clinic was staffed with three licensed social workers.

The study was a retrospective review of records. The researchers utilized the Global Assessment of Functioning (GAF) scale (Jones, Thornicroft, Coffey, & Dunn, 1995), a brief mental health outcome scale commonly used by mental health clinicians to rate the social, occupational, and psychological functioning of adults. There were 62 records in the FTF group and 63 records in the TMH group. Change in GAF score required two or more visits by a patient. Eighty-one records met criteria for two or more visits, with 30 in the FTF group and 51 in the TMH group. The mean initial GAF for the FTF group was 56, while the final GAF was 65. The mean initial GAF for the TMH group was 54, while the final GAF was 69. GAF increase was significant at the .05 level: 8.4 for the FTF group and 15.3 for the TMH group.
The findings indicated that gains as represented by improved GAF score were greater for the telemental health group (TMH) than for the face-to-face group (FTF). A strength of the study was the use of an outcome measure, something that is lacking in much of the research on behavioral telehealth. A weakness noted by the researchers was the lack of random assignment to groups that may have had a limiting effect on generalizability. A weakness that was not noted was the difference in staffing at the two sites. The FTF site was staffed with two licensed clinical psychologists and one licensed social worker, whereas the TMH site was staffed with three licensed social workers. Because GAF score is assigned by the practitioner and does not have strict criteria for assignment, score assignment may have varied based on which practitioner assigned the score (a licensed psychologist, or a licensed social worker). No inter-rater reliability was established to assure that GAF score ratings were agreed upon by the practitioners.

The results of the two studies reviewed show similarities. Both studies employed outcome measures (BMI and GAF ratings, respectively), something that is missing in many studies of behavioral telehealth. However, both studies had methodological limitations including an absence of random assignment to groups. Further research is needed among civilian populations to assess the efficacy of behavioral telehealth compared to face-to-face service provision. However, the desirable design of randomizing participants into behavioral telehealth and face-to-face groups is difficult to achieve. Most individuals receiving behavioral telehealth care are receiving it because of necessity: Face-to-face services simply are not available due to geographical or institutional isolation.
Geographically Isolated Populations

Twenty percent of the U.S. population lives in rural areas, many of which are designated as mental health professional shortage areas (American Psychological Association, 2001). Fifty-five percent of U.S. counties have no practicing psychologists, psychiatrists, or social workers (American Psychological Association, 2001). High demand for services in combination with transportation challenges involving distance and weather have led psychologists in rural areas to seek out new means by which to provide assessment and treatment (Schopp, Demiris, & Glueckauf, 2006). In rural areas, behavioral telehealth is used as a mechanism by which to decrease provider isolation in areas in which mental health providers are present, and improve quality of care in areas in which they are not (Stamm & Perednia, 2000).

Several longitudinal accounts of rural behavioral telehealth programs are consistent with Stamm and Perednia’s (2000) observation that most literature on telehealth programs prior to 1997 consisted of published accounts of practical applications rather than clinical trials. In an account of the implementation of a telemental health system directed by the state of Wyoming Department of Health, Holderegger, Fortune, and Fortune (2000) proposed telemental health care as an effective way to ‘bridge the gap’ created by distance and inclement weather in Wyoming. The authors reported that in rural areas of Wyoming, “Getting quality training to the worker in the field...is very difficult and expensive” (Holderegger et al., 2000, p. 4). Winter weather
reportedly creates treacherous ground travel conditions, and expensive air travel creates financial strain on state agencies.

In a project that spanned 5 years (1995-2000), health practitioners (paraprofessionals serving persons with dual diagnosis of mental illness and developmental disability) in Wyoming utilized satellite technology to consult with clinical psychologists in order to provide early intervention to individuals with co-occurring developmental disability and psychiatric or behavioral concerns. The project began as a support project for 56 people who had previously lived in the Wyoming State Hospital, with the goal being avoidance of future costly hospitalization. When the project began, nine providers in the state of Wyoming (only two of whom were employed as full-time psychologists) served 670 individuals with developmental disabilities, many of whom had co-occurring mental illnesses. The authors indicated that the project arose from necessity: The shortage of psychologists in Wyoming in combination with difficult and often treacherous travel conditions required innovative methods of providing care at a distance to mental health clients in need.

The State of Wyoming Teleconferencing network was utilized for psychological consultations. The hub site was the University of Wyoming. The locations of the spoke sites were not detailed. A dual prong approach was utilized that included a person-centered consultation and a consultee-centered consultation. The consultations lasted 2 hours, and all providers at the spoke site were present. During the person-centered consultation, the consulting psychologist’s role was to assess the problem, provide a diagnosis, and recommend treatment. During the consultee-centered consultation, the
psychologist's role was to provide assistance to the health provider at the spoke site in carrying out recommended treatment interventions.

After the consultation, individuals present (paraprofessional consultee and consulting psychologist) were asked to complete a one-page evaluation form regarding perception of helpfulness of the consultation. The format of the evaluation form was not explicitly addressed by the authors but appears to have included quantitative and qualitative components. Quantitative data were provided regarding perceived helpfulness of the consultations. Consultations were rated on a five-point Likert scale ranging from 1 (definitely not helpful) to 5 (definitely helpful). The mean rating was 4.6, indicating that individuals present at the consultations generally found the consultations to be helpful. Qualitative data gathered identified that the following factors that contributed to the perception of consultation helpfulness: a) receiving factual and specific recommendations, b) interacting with the consultant and the team, c) positive interpersonal qualities of the consulting psychologist, d) receiving an alternative viewpoint, e) receiving feedback on current practices, f) structured consultation, g) immediacy of services, and h) cost effectiveness.

In addition to positive provider perceptions, positive client outcomes were reported. Recidivism rates of hospitalization typically ranged from 5-15% (Holderegger et al., 2000). None of the individuals with developmental disabilities and co-occurring mental illnesses (N=90) were hospitalized after the implementation of the telemental health system. Researchers tracked hospitalizations for a period of 5 years. Only 1% returned to the state training school for medical concerns. The drop in recidivism was credited to the behavioral telehealth services. The goal of avoiding hospitalization was
met for all individuals served in the Wyoming project. The drop in hospitalizations reportedly saved thousands of dollars; however, data were not provided to demonstrate exact cost savings.

The paper was not published in a peer reviewed journal, but was adapted from a poster presentation. Participants and methodology were not explained in detail. Although the authors reported that 90 individuals avoided hospitalization, the nature of the participants’ disorders was not detailed. Additionally, the project began as a support project for 56 individuals who previously lived in the Wyoming State Hospital, and it was unclear how the remaining 34 individuals became involved in the project. Reported cost savings were anecdotal with no evidence to support the claims. Methodology through which qualitative data were obtained and examined was not explained. Although the paper represents an attempt to track the benefits of behavioral telehealth over time, the considerable methodological weaknesses greatly limit interpretation of results despite the authors’ claims of cost, time, and travel savings. Despite weaknesses, reports of factors increasing practitioners’ perceptions of helpfulness may be useful in establishing guidelines for structural organization of behavioral telehealth.

In a separate account of a practical application of telehealth to a rural population, Thomas, Miller, Hartshorn, Speck, and Walker (2005) provided an accounting of the implementation of a telepsychiatry program for rural victims of domestic violence. Because the services provided were inclusive of psychiatry, the term telemental health will be employed in the description of this account.

Thomas and his colleagues (2005) noted that there was a need for mental health care at a rural women’s crisis center in Texas. Reportedly, the waiting list for traditional
outpatient services at the mental health center was longer than the average stay in the shelter, and many women went without mental health care as a result. The shelter averaged a referral rate of three to four women per month to the local emergency room for evaluation of psychiatric symptoms, and four to eight women per year to the state mental hospital for acute psychiatric care. Telemental health care was proposed as a potential solution for the lack of services. The hub site was the University of Texas Medical Branch at Galveston Center for Telehealth, and the spoke site was the East Texas Women's Shelter.

Upon entry to the women's shelter, all women completed the Symptom Checklist 90-R (SCL-90-R; Derogatis, 1983), a 90-item self-report scale of psychiatric problems with nine symptom cluster subscales. Any woman with a T-score greater than 60 on any problem subscale was offered telemental health evaluation. If the offer was accepted, the woman was then scheduled for a combined psychological intake and psychiatric interview. Interview participants included the client, the client's staff counselor, and the psychiatric nurse practitioner (spoke site) and a psychiatrist (hub site). Psychiatric treatment was offered at the end of the evaluation at the discretion of the psychiatrist.

In the initial 18 months of the program, 79 women entered the shelter and 38 (48%) met criteria for telemental health evaluation. All of the women who were eligible for the telemental health evaluation agreed to participate; however, three (8%) left the shelter prior to completion of the initial interview. Of the 35 remaining women, 34 (97%) were diagnosed with mood and/or anxiety disorders, and 8 (23%) were diagnosed with substance use disorders. Thirty-two of the women (91%) reported past suicidal ideation and/or attempts. Twenty-five of the women (71%) had received previous evaluation or
treatment for their symptoms from either a primary health care provider or a mental health clinic. None had previously received services through telemental health.

After the initial interview, 4 women left the shelter, leaving 31 women who continued to utilize telemental health services. The remaining women averaged three follow-up appointments during the remainder of their time at the shelter (a range of 4-6 weeks). The women were asked to complete a satisfaction questionnaire following each telemental health session. Of the remaining 31 women, 27 (87%) completed the questionnaires. The 21-item questionnaire was developed by the authors and scored on a five-point Likert scale. Items assessed the women’s perceptions of the telemental health technology, the psychiatrist, and the presenters (psychiatric nurse practitioner and/or staff counselors who joined the women during the consultation). Rates of satisfaction with the psychiatrist and presenter were high (4.9, with 5 indicating the highest rate of satisfaction). In addition, rates of satisfaction with the telemental health technology were high (4.8). Although users reported moderate anxiety about utilizing telemental health services prior to their meetings (3.4, with 1 representing no feelings of anxiety and 5 representing strong feelings of anxiety), comfort with telemedicine increased after its use (4.4, with 5 representing strong agreement that anxieties were relieved after the initial meeting).

The authors reported that during the 18 months in which the program had operated only one woman was referred to the local emergency room for assessment. No referrals were made to the state hospital. After the women were determined to have stabilized, 2 of the remaining 31 left the region for reasons of safety, 2 returned to previous providers for further mental health services, and 27 were referred to the local
community mental health center for continued outpatient treatment. No information was provided regarding how the determination of stabilization was made.

The authors accomplished their goal of providing services to women who would not have otherwise received services as a result of lengthy waiting lists at the local community mental health center. As a result, referral rates to the local emergency room and the state hospital decreased drastically. Consistent with type of data provided in many other studies, raw data provided were limited to type of diagnoses and client satisfaction ratings. The use of the SCL-90-R as a screening measure represented a positive attempt to standardize screening processes. Assessment with the SCL-90-R at the time of discharge may have provided useful data that could be compared to later studies. However, the small sample size and absence of data related to symptom severity at the time of intake and discharge limit the generalizability of results.

Cruz, Krupinski, Lopez, and Weinstein (2005) performed a retrospective review of data from a 5-year (1998-2002) behavioral telehealth project at the University of Arizona that was designed to serve rural populations in Arizona. Data were obtained from medical records that contained demographic information and the psychiatrists’ notes that detailed type of service provided (consultation, medication management, and psychotherapy). All telepsychiatrists and patients were asked to complete a satisfaction form after each teleconsultation. The form utilized a six-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). Items assessed perceptions of the videoconferencing equipment, clarity of communication, accessibility of care, efficiency of care, and satisfaction with the behavioral telehealth care compared to face-to-face care.
Two hundred and six patient records were reviewed, with a total of 1086 teleconsultations available for review. Seventy-seven percent were adults age 18-95 (n = 159), and 23% were children age 2-17 (n = 47). Racial demographics varied significantly over the 5-year period. In the first year, 14% of adults were Hispanic, 83% were Caucasian, and 3% were Native American. In the fifth year, 2% of adults were Hispanic, 67% were Caucasian, and 31% were Native American. No explanation was provided for the increase in Native American clientele and the decrease in Hispanic clientele.

Return rates of the satisfaction survey were 51% for adult patients and 23% for telepsychiatrists. No data were provided for satisfaction of children. The researchers reported that 100% of adult patients reported overall satisfaction with behavioral telehealth. Ninety-six percent responded that tementeal health care was as good as face-to-face care. Although 48% reported that they would prefer face-to-face care, 85% reported that they would prefer behavioral telehealth care rather than waiting for services. Telepsychiatrists reported that they were confident in the diagnosis they provided 89% of the time, and that the tementeal health examination provided them with sufficient information 89% of the time. They reported that communication was unimpaired 87% of the time, and that rapport was unimpaired 72% of the time. Thirty-one percent of the time, telepsychiatrists reported that they would prefer to see the client in person. All areas were assessed through telepsychiatrist self-report. No comparative data were provided regarding face-to-face treatment. The researchers concluded that the continued use of the behavioral telehealth system over 5 years was evidence of its efficacy, and that the program provided a “promising solution to geographical barriers to psychiatric care for rural Americans” (Cruz et al., 2005, p. 237).
Due to methodological limitations, the interpretation and generalizability of results are limited. Although the median number of telemental health consultations per client was 2, the range was extremely large (1-56). Clients were asked but not required to complete the satisfaction form after each teleconsultation. It is possible that individuals who had a favorable impression of the service provided returned for consultations multiple times and completed the survey multiple times, while those with unfavorable impressions did not.

Although the 100% overall satisfaction rate reported by Cruz and his colleagues seems relatively high, the data are comparable to rates of satisfaction (90%) reported by Greenwood, Chamberlain, and Parker (2004). Greenwood and his colleagues compared client perceptions of services provided via behavioral telehealth or face-to-face. Participants were 31 clients who had been referred by general practitioners (83%), community mental health centers (10%), and psychiatrists (7%) to a specialty mood disorder clinic in a rural setting for consultation and assessment. Participants completed a retrospective (post-treatment) 31-question evaluation of behavioral telehealth as a means of service provision compared to face-to-face services. The scale was a 3-point response measure established by the researchers with options of “strongly agree”, “agree”, and “disagree”.

Participants received services in both face-to-face and behavioral telehealth formats. Of the 31 participants, only 20 (65%) fully completed the questionnaire. Six (19%) could not be contacted and five (16%) refused to participate.

A 95% overall satisfaction rate was reported regarding the consultation process as a whole (45% “strongly agree, 50% “agree”). Satisfaction with the behavioral telehealth
component was 90% (10% “strongly agree”, 80% “agree”). Eighty percent of respondents indicated a willingness to utilize behavioral telehealth in the future (20% “strongly agree”, 60% “agree”). Although results indicated that respondents held a preference for face-to-face services, satisfaction with behavioral telehealth as an alternative means was highly rated.

The reliability of the study is questionable due to the nature of the evaluation methods. The researchers created the questionnaire and the creation of the response categories “strongly agree”, “agree”, and “disagree” indicate possible researcher bias in the favor of agreement. Additionally, nearly all questions were worded in the affirmative (e.g., “Would prefer telepsychiatry” or “Happy to use telepsychiatry again”) (Greenwood et al., 2004, p. 270). Although both the Greenwood et al. and Cruz et al. studies indicated high rates of client satisfaction with behavioral telehealth among rural residents, the measurements appear to have lacked validity and any interpretation that could be made from the results is therefore limited.

The studies carried out by Holdregger et al. and Cruz et al. represented positive attempts at establishing longitudinal data related to provider (Holdregger et al., 2000) and client (Cruz et al., 2005) satisfaction. Reports of helpfulness were positive among providers (Holdregger et al., 2000) as were reports of satisfaction among clients (Cruz et al., 2005; Greenwood et al., 2004). However, researchers in both instances established their own questionnaires to assess for perceptions of helpfulness or satisfaction. Stamm and Peredina (2000) advised against developing new measures for evaluation, stating that “to have data that can be aggregated across the different sites...researchers must standardize the collection mechanisms and conditions as much as possible” (p. 187).
Limited validity not only limits interpretation of individual studies, but also limits future meta-analysis. Similar to the state of literature on incarcerated populations, anecdotal observations were provided in regard to cost savings and clinical outcomes.

Researchers reported that “the merit of applications that used technology for rural outreach should be based on empirical study of a variety of factors, including clinical outcomes, clinical processes, cost offset, access issues, and acceptability of technology to patients, family members, and psychologists” (Schopp et al., 2006, p. 169). Additionally, it has been advised that “before adoption into routine use, any new technology has to be proved to be superior to the approach that it is intended to replace, that is, it has to be more effective or more cost-effective than the alternatives” (Greenwood et al., 2004, p. 269).

**Clinical Outcome Research for Geographically Isolated Populations**

Empirical evaluation of behavioral telehealth is in the initial stages of development (Glueckauf, Stine, Bourgeois, Pomidor, Rom, Young, et al., 2005). However, empirical evaluation of behavioral telehealth is crucial in advancing the acceptance and use of behavioral telehealth. Outcomes achieved need to be equivalent to those achieved via traditional face to face care in order to accomplish widespread acceptance (Schopp et al., 2006).

Currently, there is neither an adequate empirical nor experiential basis for the development of clinical guidelines for the use of behavioral telehealth (Reed, McLaughlin, & Milholland, 2000). Formation of clinical guidelines would allow for greater consumer access to standards of treatment that could be expected from care providers, resulting in global connectivity (Jerome, DeLeon, James, Folen, Earles, &
Gedney, 2000). Guidelines for behavioral telehealth should be based not on the treatment medium (telehealth technology) but on the purpose or condition for which the tool is used (Reed et al., 2000). Recent empirical studies of the efficacy of treatment via behavioral telehealth have been based on a single conditions (or diagnoses), representing the first step towards the development of an empirical basis from which to create clinical guidelines for behavioral telehealth.

Although behavioral telehealth rose from grassroots application and not from traditional empirical evaluation (Stamm & Peredina, 2000), the trends of current research on behavioral telehealth in rural areas indicate that researchers are recognizing a need for a shift towards empirical evidence to support behavioral telehealth.

In the first evolutionary step of clinical outcome research development, researchers present information on how behavioral telehealth can provide solutions for a given problem. The purpose is to test "goodness of fit" of behavioral telehealth programs with a given population (Glueckauf et al., 2005). Analysis of goodness of fit varies in the manner in which it is carried out. Whereas some researchers run focus groups and review literature to determine if services would be feasible, others speculate regarding technology cost, provider reimbursement, privacy and confidentiality issues, and logistical issues such as placement of the hub and spoke sites (Miller, 2005).

Although seemingly an important step, goodness of fit testing is noticeably absent in much of the research on behavioral telehealth. Because many behavioral telehealth programs often arise from necessity as a result of a lack of services in isolated areas, it is possible that the absence of goodness of fit testing is the result of the perception of behavioral telehealth as a necessity.
The emergence of case studies represents a movement towards the development of a body of research that is based not on the technology, but on single conditions or diagnoses. Additionally, the emergence of case studies represents the second evolutionary step in the arena of clinical outcome research for behavioral telehealth.

Cowain (2001) recently reported on a case in which cognitive-behavioral therapy was provided to a 38-year-old woman (Ms. M) in a rural area of South Australia via videoconferencing. Ms. M had been diagnosed with panic attacks, agoraphobia, and depression, and had received multiple trials of psychiatric treatment in both inpatient and outpatient capacities from the ages of 18-30. She reportedly had not found treatment to be helpful. At the age of 30 she married and moved with her husband to a rural area. Ms. M avoided further mental health services until the age of 38 at which time the death of her mother led to an escalation in her symptoms. Ms. M presented at a local hospital under the belief that she was dying. She refused psychotropic medication. Ms. M was clinically elevated on measures of depression and anxiety, as indicated by preliminary assessment with the Beck Depression Inventory (BDI-II; Beck, Steer, & Brown, 1996) and Beck Anxiety Inventory (BAI; Beck & Steer, 1993) (scores of 14 and 46, respectively).

The placement of hub and spoke sites was not detailed in the case study, nor was the qualifications or credentials of the individual who provided services. Treatment was provided via videoconferencing in a 12-session cognitive-behavioral (CBT) format. During early sessions (1-9) the focus was on education, exposure, experiments, and thought records. During later sessions (10-11) the focus was on relapse prevention. Ms. M was assessed using the BDI and BAI at session 11, and scored 0 and 3, respectively. She reported that she had not experienced any panic attacks after session 4. The author
reported that improvement was maintained at a follow-up 1 month after termination; however, assessment measurement scores were not provided to support the claim.

The author proposed that CBT therapy provided through behavioral telehealth means can be effective. However, there was a confounding variable of medication that may limit the validity of results. The patient agreed to a trial of medication in session 4. It is difficult to determine whether the gains made in therapy were a result of therapy provision, or the result of medication. Based on the confounding variable the results of the study are likely not generalizable. Despite these limitations, the use of common assessment measures in the case study was a strength of the study. Much of the research on behavioral telehealth to date had relied on Likert scaling and observational data.

The author noted several observations that may serve to guide future research and service provision for the treatment of panic, anxiety, and depression. First, it was reported that there was a perceived restriction in empathetic affect on the part of the therapist during times that Ms. M was distressed that required the therapist to utilize more active verbal support to demonstrate empathetic understanding. It may be necessary for therapists to use less reliance on non-verbal cues, and more on verbal cues when providing services via behavioral telehealth medium. Additionally the therapist noted that as part of CBT management of panic disorder the patient was asked to simulate autonomic sensations of a panic attack during the session. The therapist indicated that informed consent of risks and benefits centered on the risk that the patient may have a panic attack while alone in a room that was reportedly 300 kilometers away from the therapist. Reportedly, the client agreed to the exercise but became tearful after
completing the exercise. The case study exemplifies that specificity of risk issues may be an important part of the development of guidelines for the usage of behavioral telehealth.

In another example of a case study for an individual condition (diagnosis), Bakke, Mitchell, Wonderlich, and Erickson (2001) reported on their experience in utilizing behavioral telehealth technology for treatment of two women with diagnoses of bulimia nervosa (BN). The hub site was located in Fargo, North Dakota. The spoke site was located in Grand Forks, North Dakota. The authors reported that subjects were recruited in Grand Forks; however, they did not explain the method of recruitment. Reportedly, both subjects were evaluated by the primary author, and met criteria based on current guidelines in the DSM-IV (American Psychological Association, 1994, Diagnostic and statistical manual of mental disorders, 4th ed., text revision). Of the two participants, one was binge eating and purging once per day and the other reported six binge eating and eight purging episodes per week. The participants received manualized cognitive-behavioral therapy (CBT) from a doctoral-level psychologist who had been trained in treatment of eating disorders. Progress in treatment was assessed for through participant self-report.

The authors did not reference which manualized treatment was utilized, nor did they provide information pertaining to the length of treatment, frequency or content of sessions. They reported that both participants had abstained from binge eating and purging for 4 weeks prior to ending treatment. At a follow-up session 1 month later, both participants had reportedly remained abstinent.

The authors reported that the cases demonstrated “the potential utility of delivering manual-based CBT to patients with BN via (telehealth) and of delivering
manual-based psychotherapies to psychiatric patients in general” (Bakke et al., 2001, p. 457). Such over-arching generalizations are likely not merited based on the small sample size and reliance on self-report for assessment of change.

The authors recommend the use of manualized therapies as a treatment protocol for treatment delivered via behavioral telehealth because of their empirical backing. The use of manualized CBT is representative of a strength in the study; however, the failure on the part of the authors to provide information regarding the content, frequency, and length of treatment is a weakness. The researchers reported that a randomized trial comparing the effectiveness of CBT for BN delivered via behavioral telehealth to CBT for BN delivered face-to-face was underway. At the time of this review (2006) no such study had been published.

Bakke et al. (2001) reported that “empirical studies examining the effectiveness of telemedicine in psychiatry have been limited in number and scope and there have been no published reports of randomized treatment trials examining the effectiveness of psychotherapy delivered via telemedicine” (p. 455). The emergence of a randomized trials examining the effectiveness behavioral telehealth in producing clinical outcomes is representative of the beginnings of a final step in the evolution of behavioral telehealth research.

There are very few randomized clinical outcome studies examining the efficacy of behavioral telehealth. However, several researchers have made attempts to randomize participants into treatment groups based on the treatment medium (face to face and behavioral telehealth). Aside from one military account of treatment of obesity already recounted in this literature review (James et al., 2001), these studies represent the first
attempts at comparative research of behavioral telehealth to traditional face to face care. Because outcomes achieved via behavioral telehealth need to be equivalent to those achieved via traditional face to face care in order to enhance acceptance of behavioral telehealth as a treatment medium (Schopp et al., 2006), this final step is crucial in the advancement of behavioral telehealth.

Poon and her colleagues recently compared outcomes of older adults (age not specified) with memory problems based on the manner by which they received treatment: face to face, or via behavioral telehealth. The study took place in China, where subjects were recruited from a community center for seniors. Participants were first screened using the Cantonese version of the Mini-Mental State Examination, which was in preliminary stages of reliability and validity testing (C-MMSE; Chiu, Lee, Chung, & Kwong, 1994). Psychometric properties of the measure were not provided, and were not available through the Mental Measurements Yearbook (Spies & Plake, 2005). Participants were referred to a geriatrician (a medical doctor who specializes in the care of aged persons) for confirmation of diagnosis of mild cognitive impairment or mild dementia if they scored below clinical cut-off points (baseline score of 14-22). The researchers did not explain how the geriatrician confirmed diagnoses; however, twenty-two subjects were selected and randomized into two groups of 11 participants each.

The researchers reported that cognitive interventions were conducted over 6 weeks, utilizing behavioral telehealth (videoconferencing) or face to face methods. Cognitive interventions were administered by a social worker at the senior center. The content of interventions was not detailed in the study. Participants in the behavioral telehealth group were asked to complete a satisfaction questionnaire pertaining to the
treatment medium (videoconferencing). Participants were assessed pre- and post-treatment using the Cantonese version of the Mini-Mental State Examination (C-MMSE; Chiu et al., 1994), the Cantonese version of Rivermead Behavioral Memory Test (C-RBMT; Wilson, Cockburn, & Baddeley, 1985), and the Hierarchic Dementia Scale (HDS; Cole & Dastoor, 1983). The RBMT has been validated for detection and monitoring of memory problems (Wilson, Cockburn, Baddeley, & Hiorns, 1989). The HDS has been found to be a valid instrument for determination of cognitive deficits in persons with dementia (Ronnberg & Ericsson, 1994). Reliability and validity coefficients for the Cantonese versions of the assessment measures were not provided, and were not available through the Mental Measurements Yearbook (Spies & Plake, 2005). The author performed a literature review and was unable to find reliability or validity information for the C-MMSE or HDS. A preliminary study of validation of the RBMT was available (Wai-kwong Man & Li, 2001), however, validity was determined via correlation of scores to the C-MMSE (a measure for which this author found no reliability or validity information). Test-retest reliability was reported as good ($r = 0.95$). An additional limitation of the preliminary study of RBMT reliability and validity was that the study was an assessment of the Chinese version of the RBMT. It was unclear whether the Chinese RMBT was modeled after standard Mandarin, or Cantonese. Therefore, reliability and validity likely should not be generalized to the study in review (which utilized the Cantonese version of the RMBT).

Prior to treatment, no significant differences were found between the two groups in baseline scores or demographic characteristics. Following treatment, the authors reported that both groups improved significantly in areas of attention, memory,
calculation, and language (although no data were provided to support these claims). It was reported that the face to face group demonstrated improvement in spatial construction, whereas the behavioral telehealth group did not. The authors proposed that training in spatial construction often requires physical guidance, and therefore could not be effectively delivered via behavioral telehealth.

The source of the authors' conclusions as they pertained to specified areas of attention, memory, calculation, language, and spatial construction, were not detailed. The authors reported a 90% participant satisfaction rate with the behavioral telehealth system (specifically, satisfaction related to audio and visual quality of the videoconferencing system).

The authors reported that no modifications were made in interventions provided via behavioral telehealth or via face-to-face. An observational report was made that the behavioral telehealth group preferred the treatment medium because they believed that it saved time and money (cost of travel) as compared to programs offered in day clinics. The authors proposed that based on the results, behavioral telehealth provided an acceptable means of service delivery that had the ability to enhance accessibility of services to a population.

Although the sample size for the study was much larger than many samples utilized in behavioral telehealth research (typically, case studies,) it was still relatively small at only 22 participants. Additionally, the researchers noted that the short follow-up period (6 weeks) was likely a limitation, provided that gains in cognitive performance are expected to be lost in a relatively short period. An additionally follow up may have enhanced the validity of the results. The study represented a positive attempt to
empirically study treatment gains made when utilizing a behavioral telehealth medium as compared to traditional services. However, interpretation of the results is greatly limited by both the absence of data to support claims and the use Cantonese versions of measurements that had not been validated or shown reliable.

In a randomized, controlled trial, Ruskin and his colleagues (2004) compared treatment outcomes of veterans who were treated for depression by means of behavioral telehealth or traditional, in person care. All veterans who were referred to the Department of Veterans Affairs in Maryland were evaluated for participation through use of the Hamilton Depression Rating Scale (HDRS; Hamilton, 1960) and the Structured Clinical Interview for DSM-IV (SCID; First, Spitzer, Gibbon, & Williams, 1996). The authors did not provide reliability and validity information for the HDRS. In a recent review of the validity and reliability of the HDRS it was reported that the HDRS was one of the most widely used and accepted outcome measure for evaluating depression severity, with test-retest reliability ranging from $r = 0.81$ to $r = 0.98$ (time frame not reported) and well-established convergent, discriminant, and predictive validity (Bagby, Ryder, Schuller, & Marshall, 2004). Inclusion criteria were a score of 16 or higher on the HDRS and SCID criteria for one of five diagnoses: Major depressive disorder, dysthymic disorder, adjustment disorder with depressed mood, mood disorder due to a general medical condition, or depressive disorder not otherwise specified.

Veterans who chose to participate ($N = 119$) were randomly assigned to a behavioral telehealth or face to face treatment condition. Participants were 105 men and 14 women. Treatment consisted of eight 20-minute sessions over a 6-month period. The
treating psychiatrist provided antidepressant medication management, psychoeducation, and brief supportive counseling.

Veterans were assessed after the 6-month period using the Hamilton Depression Rating Scale (Hamilton, 1960). A significant decrease in depressed symptoms occurred in both treatment groups. No significant differences were found between treatment groups. At the end of the 6-month treatment period, 39% of the behavioral telehealth treatment group and 35% of in-person treatment group were in remission (as indicated by the HDRS). Response to treatment was determined based on 50% improvement from first to last visit (on HDRS scale scores). Forty-nine percent of behavioral telehealth participants responded to treatment and 43% of in-person participants responded to treatment.

A primary limitation of the study existed in its design as related to treatment conditions (behavioral telehealth versus in-patient). Patients were required to come into the clinic for treatment regardless of the method through which they received treatment. It is difficult to determine how this may have impacted patients. Additionally, the study was carried out with a VA population that was predominantly male, and results may not be generalizable to a civilian population, or to a female population. Despite these limitation, the research was one of the first large-scale attempts at randomization into treatment groups, and is representative of a progressive movement towards a continuation of similar research.

Discussion

Within the prison system, behavioral telehealth has been hypothesized to improve quality of care, create a more secure environment for the general population and prison
population, and ease financial strain that occurs as a result of transportation of inmates. Although data are unavailable to validate such claims, antidotal observations support the claims and are consistent across the research (Magaletta et al., 1998; Manfredi et al., 2005). Acceptance of behavioral telehealth was reported as relatively high among inmates (Magaletta et al., 2000).

Among military populations, behavioral telehealth was proposed as a solution to providing mental health services when military personnel were separated from providers as a result of deployment or living in a remote area (Grady & Melcer, 2005; James et al., 2001). Behavioral telehealth was found to be as effective as face to face treatment in the treatment of obesity (James et al., 2001). Greater increases in Global Assessment of Functioning scale scores were reported for military users of behavioral telehealth than for military personnel receiving services in a traditional face-to-face format (Grady & Melcer, 2005).

Among geographically isolated populations, provider (psychologist, psychiatrist, or case worker) satisfaction with behavioral telehealth technology has been reported as high and providers generally found consultations to be helpful (Holderegger et al., 2000). Patient reports of satisfaction with behavioral telehealth technology have consistently been reported as high (Cruz et al., 2005; Greenwood et al., 2004; Thomas et al., 2005). Cost savings were observed as a result of decreased rates of hospitalization and emergency room visits related to mental health (Holderegger et al., 2000; Thomas et al., 2005). Use of behavioral telehealth decreased time spent on a waiting-list, allowing for service provision to individuals who may not otherwise have received services (Thomas et al., 2005).
Behavioral telehealth has been proposed to be a successful means through which to deliver CBT therapy for depression (Cowain, 2001; Ruskin et al., 2004) and for bulimia nervosa (Bakke et al., 2001). Additionally, cognitive interventions have been conducted in trials with geriatric populations with memory problems (Poon, Hui, Dai, Kwok, & Woo, 2005).

Overall, behavioral telehealth research tends to be methodologically flawed. Usage of assessment instruments with sound psychometric properties is notably absent in much of the research. Often, studies that did utilize standard assessment instruments failed to utilize the assessment measures at pre- and post-treatment, and instead used the assessment measure to determine inclusion or exclusion for study participants. Researchers of behavioral telehealth commonly establish their own assessment measures (typically, Likert scales) in order to examine patient and provider satisfaction. Such scales are often biased by the researchers who are writing them. Additionally, creation of new scales limits comparison across samples. Because patient satisfaction is generally high across all research (of institutionally and geographically isolated populations), it may behoove researchers to abandon patient satisfaction ratings and to instead adopt outcome ratings. A standard assessment measure of functioning such as the Outcome-Questionnaire 45.2 (OQ-45.2; Lambert et al., 1999) would allow for comparison across studies, and could easily be supplemented by an assessment measurement that was specific to the nature of the population (for example, the BDI-II [Beck et al., 1996] if service provision is for individuals who are diagnosed with depression).

Another weakness of behavioral telehealth research is a reliance on observation and anecdotal reports. Although observational and anecdotal evidence may be useful in
creating guidelines for the usage of telehealth, such results are not sufficient to stand alone given the current state of the observational data. The majority of observational and anecdotal material relating to behavioral telehealth is not quantified. If behavioral telehealth programs are to be granted funding, movement away from observational data (or movement towards quantified observational data) will likely be necessary as government agencies look for quantitative data to justify financial assistance. Research in which quantitative data are provided regarding cost differentials for behavioral telehealth and standard service provision is needed.

Lack of agreement in regards to what constitutes a telehealth network, what forms of technology are acceptable methods of service provision, and what telehealth networks should be called (for example, behavioral telehealth network, telepsychology network, telepsychiatry network, telemental health care network) also present an area of weakness in research. Lack of agreement on such basic elements has led to a belief that psychologists are not utilizing behavioral telehealth technology. However, behavioral telehealth technology has not clearly been defined, and discontinuity of terms is a source of confusion in the field. Researchers need to agree upon a term (such as behavioral telehealth), acceptable methods of service provision (specifically, whether or not the telephone should be included in telehealth service delivery), and network design (for example, standardization of the “hub” and “spoke” design proposed by Nickelson in 1996).

Research pertaining to clinical outcomes achieved via behavioral telehealth is limited. A portion of the existing research exists in the form of case studies, many of which are contaminated by confounding variables (such as the use of medication).
Researchers have referenced large-scale studies in which participants are randomly assigned into groups (behavioral telehealth and face-to-face) as the desired method through which to prove that treatment via behavioral telehealth is as efficacious as treatment provided in person (Schopp et al., 2006). A possible reason for the lack of such research is the sense of “necessity” through which telehealth programs often emerge. In most cases, behavioral telehealth is necessitated as a result of lack of mental health care providers, and therefore the desired design condition of in-person treatment and behavioral telehealth treatment conditions are difficult to achieve. Researchers may need to consider alternate methods of examining behavioral telehealth on a larger scale (e.g., comparative research based on collection of data pre- and post-introduction of a behavioral telehealth network).

A final weakness of behavioral telehealth research is a disagreement in regards to how the success of a program is measured. Researchers have suggested that the continued use of a behavioral network was evidence of its efficacy and success (Cruz et al., 2005). If that were the case, it would seem that number and type of visit would be the only data required to prove that a telehealth network were successful and should remain in place. However, there is an apparent consensus among researchers that information on client outcomes and cost savings are necessary in order for behavioral telehealth to obtain widespread acceptance. Based on these requests, it would seem that some combination of factors including equivalent clinical outcomes (behavioral telehealth and face-to-face modalities) and reduced cost would indicate that a behavioral telehealth program were successful.
In order for researchers to continue pursuing a meaningful path, it is advisable that researchers and program planners first determine what combination of elements would constitute a successful behavioral telehealth network. Proponents for the development of clinical guidelines advocate that formation of guidelines would advance acceptance of behavioral telehealth (Jerome et al., 2000). Critics report that the empirical basing for formation of guidelines does not exist (Reed et al., 2000).

The result is a chicken and egg phenomenon: A disagreement in regards to whether outcome research should be done prior to the formation of clinical guidelines, or after the formation of guidelines. Each method has benefits and drawbacks. If clinical guidelines were to be formed prior to outcome research, the guidelines could provide recommendations that may allow for standardization of programs and future research. Such standardization would allow for easier comparison of behavioral telehealth networks. However, establishment of guidelines may be premature given the state of the research, and frequent revisions would likely be required. On the other hand, if outcome research were to continue with a goal of the eventual establishment of guidelines for behavioral telehealth, a more clear formation of guidelines would likely result. However, without initial standardization of general guidelines, the process would likely continue in the fragmented manner which is standard in current literature.

Behavioral telehealth networks offer provision of care over a distance, allowing for improved quality of care as a result of better access to mental health care providers. Behavioral telehealth networks offer great potential for reaching and treating individuals who are geographically and institutionally isolated. Despite such potential, behavioral telehealth research is in its initial stages and the lack of a conceptual definition of
telehealth, flawed outcome research, fragmented understanding of what delineates a successful program, and an absence of guidelines for the usage of telehealth are currently serving as impediments to acceptance of behavioral telehealth and adoption of usage.
Reference:


