



2008-07-10

Psychoeducational Dissemination Across Distance: The Viability of Telehealth with the Deaf Population

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ABSTRACT

ACKNOWLEDGMENTS

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CHAPTER ONE

INTRODUCTION

Psychoeducational Dissemination Across Distance: Telehealth vs. In-Person

The phone rings at the secretary's desk of the Arizona Telemedicine Program. The secretary answers the phone and jots down a referral being made from the lone and desperate general physician in a rural community in southern Arizona where most roads are occasionally impassible. The doctor describes the referral, a forty-one year-old deaf woman who can only communicate via American Sign Language (ASL). Due to the dearth of interpreters in the area, the doctor feels incompetent and unable to treat his patient for her depression and, subsequently, suicidal signs and symptoms. A videoconferencing consultation is arranged for the next day. The woman appears for her consultation and is shocked to see a clinician on the TV screen that is fluent in ASL. The clinician works with the patient over a period of several weeks. At the termination session, the patient's depression symptoms have alleviated considerably. Armed with a new outlook on life, the patient goes about her daily activities with the knowledge and confidence that help is as close as the local clinic where the videoconferencing system is housed. The patient, in spite of the fact that she lives in a rural community hundreds of miles away from urban civilization and with few individuals who can sign with her, now has access to the health care she needs.

The above scenario is based on a true event and provides an excellent example of one of the potential uses of videoconferencing technology (see Lopez et al., 2004). The use of videoconferencing technology creates an unique therapeutic/didactic interaction that spawns further scientific investigation on the efficiency and efficacy of the

communication medium. Unlike a traditional healthcare encounter, which exists through a physical space, such technology creates a dyad that brings both doctor and patient together (Turner, 2003).

Introduction: History and Significance of Telehealth

The separation of physician and patient occurring without the aid of technology dates back to the Middle Ages. In one recorded instance, the physician would stand on one side of the river and examine a patient for plague on the opposite side in order to diminish the risk to the physician (Turner, 2003). Using distance as a prophylaxis was also demonstrated when leprous individuals would ring bells in an effort to warn others not to come near (Darkins & Cary, 2000). Later, the development of the postal service in the mid-nineteenth century created the opportunity for patients to write their physician and seek out advice (Elford & Battcock, 1997 as cited in Turner).

Over the last half century, there has been an explosion of communication-mediating technology. Indeed, the past several decades may be viewed as a technological revolution. The boom of various technology devices has had a profound impact on how people live their daily lives. These technologies provide ample opportunities to alleviate the separation barrier between physician and patient. Various technologies include, but are not limited to, the telephone, the modern and versatile cell phone, the Internet, pagers, Palm Pilots, and interactive videoconferencing apparatuses. Of these technologies, interactive videoconferencing may be the most viable to the field of mental health when distance separates the participants (Baer, Elford, & Cukor, 1997; see also Reid, 2000).

Most providers of mental health services are not aware that interactive videoconferencing has been in use—although sporadically—to provide psychological

related services for over forty years (Baer et al., 1997; Benschoter, Wittson, & Ingham, 1965; Dongier, Tempier, Lalinec-Michaud, & Meunier, 1986; Dwyer, 1973; Nickelson, 1998; Solow, Weiss, Bergen, & Sanborn, 1971; Wittson, Affleck, & Johnson, 1961). For example, the late 1950's saw the University of Nebraska School of Medicine begin experimenting with a closed-circuit television link to provide psychiatric and other health services between the Nebraska Psychiatric Institute and Norfolk State Hospital (Benschoter, 1967; Nickelson). From this point on, with various federal and financial grants, a number of sites sprang up in rural and urban areas that provided psychological services along with initial reports of clinical effectiveness and user satisfaction. Despite the auspicious reports of success with the technology, the high costs of purchasing and using the equipment led to the downfall of almost all existing videoconferencing sites. Not until the late 1980's and early 1990's, with the advent of the Internet, along with better technology coupled with lower costs, did a resurgence of interest take place (Maheu, 1999; Maxmen, 1978; Nickelson; Turner, 2003).

In each of the last five decades that researchers have experimented with the use of interactive videoconferencing technology, the medium has been hailed as a panacea for the lack of manpower in bringing healthcare to underserved populations (Baer et al., 1997). This technology appears to hold great potential in alleviating a wide range of other obstacles in accessing mental health care as well. These obstacles or barriers to accessing health care may include the geographic location of the potential consumer, cultural or language differences of the consumer, economic status of the consumer or lack of specialized clinicians to work with the consumer (Nickelson, 1996, 1998; Sleek, 1997; Stamm, 1998). The possibility of such technology helping to alleviate health professional

shortage areas as well as provide minority or special cultural populations improved access to health care is both novel and exciting (McCarty & Clancy, 2002).

In order to integrate such technology in the provision of psychological-related services, studies of efficacy, effectiveness, and acceptability must be forthcoming (Jennett et al., 2003; Mair & Whitten, 2000; Stamm & Perednia, 2000; Williams, May, & Esmail, 2001). In a recent meta-analysis on the videoconferencing literature, only a handful of studies were identified that compared the use of face-to-face interventions with the technology to deliver psychological-related services (Hyler, Gangure, & Batchelder, 2005). Although there is a growing body of research being accumulated which compares the use of traditional face-to-face interventions to those that employ the use of the technology, further research to ground the use of such technology as an effective and viable means of delivering psychological services remains a clarion call (Hilty, Liu, Marks, & Callahan, 2003).

Telehealth Defined

It is important to note that throughout the literature, various terms have been used to describe interactive videoconferencing technology to disseminate mental health services. These metonymy of terms have included *telemedicine*, *telehealth*, *teletherapy*, or *telepsychiatry*, to name a few. The term *telehealth* seems to be the more comprehensive and inclusive to the gamut of potential uses of this technology (Nickelson, 1998; Stamm, 1998). Moreover, the term *telehealth* and David Nickelson's (1998) definition of this term, appears to be the most widely accepted throughout the literature (Barnett & Scheetz, 2003; Conrad, 1998; Folen, James, Verschell, & Earles, 2005; Maheu, 1999; Stamm). Nickelson defined *telehealth* as "the use of

telecommunications and information technology to provide access to health assessment, diagnosis, intervention, consultation, supervision, education, and information across distance” (p. 527). Nickelson’s definition clearly may include a wide range of communication promoting technology such as e-mail, Plain Old Telephone Service (POTS), or videoconferencing. For the purposes of the present study, the term *telehealth* will follow Nickelson’s aforementioned definition with a specific emphasis on the term having reference to the use of such technology for psychological interventions or education at a distance, using synchronous videoconferencing technology. Unless noted otherwise in descriptions of various studies as pointed out in the literature review, all references to the use of synchronous videoconferencing technology will be referred to as *telehealth*.

Telehealth is simply a tool that with appropriate accommodations and limitations, makes it easier to practice already established professional skills in a clinician’s repertoire, at a distance; furthermore, telehealth provides an avenue of mental health care for individuals who may not otherwise receive such services (Nickelson, 1998).

Using Telehealth to Serve a Specific Population

The scientific investigation of telehealth spans many possible areas. One area ripe for research on telehealth is the investigation of specific populations for which telehealth appears to be efficacious (Glueckauf & Ketterson, 2004; Hyler et al., 2005; Liss, Glueckauf, & Ecklund-Johnson, 2002). Another area needing further exploration is the usage of such technology to disseminate psychoeducational objectives at a distance (Baer et al., 1997; Hilty, Gammon, Sorlie, Bergvik, & Holfodt, 1998; Hilty, Liu, Marks,

& Callahan., 2003). The combination of these two needed research areas appears to be a perfect fit for one specific and truly underserved population—the deaf population.

Within the deaf population, an extreme health professional shortage exists that may be alleviated with the use of telehealth. Moreover, for reasons discussed later, much needed mental health education within this population remains largely inaccessible (e.g., Ouellette, Burgess, & Shaw, n.d.). One estimate indicated that a mere 2% of deaf persons in need of mental health services actually received them (Vernon, 1983 as cited in Pollard, 1994; see also Steinberg, 1991). Moreover, one researcher found that mental health care was the most requested but least available service mentioned in a survey of community centers for deaf people (Warner, 1987 as cited in Pollard). Estimates of the number of deaf Americans who need some form of mental health intervention, such as substance abuse counseling or parenting advice have ranged from 100,000 to one million (Bahan, Hoffmeister, & Lane, 1996). Unfortunately, due to the lack of competent clinicians abroad who know the client's culture or who can speak the client's language fluently, this population's access to mental health services is severely limited (Munro-Ludders, Simpatico, & Zvetina, 2004; Pollard, 1998). A 1990 study estimated that there were only twenty deaf psychologists in the entire United States (Bahan et al.).

As an underserved and widely dispersed minority population, the use of telehealth to alleviate inaccessibility to psychological services may be a solution to this problem (Lopez et al., 2004). Indeed, the deaf population appears to have every reason to benefit from the use of telehealth to receive mental health services. Some of these reasons may include a) the principal mode of communication for the deaf population is visual; b) for the clinician, most diagnostic and treatment information is gathered via the means of

visual communication; c) there is typically little need for laboratory tests for diagnosis or consultation; and d) there is a desperate need to extend mental health services to this underserved population whether in rural or sprawling urban populations (e.g. Afrin & Critchfield, 1997; Baer et al., 1997; Siwicki, 2000).

In order to advance the usage of telehealth, we must begin to subject to scientific scrutiny basic assumptions about what is effective in telehealth communication – especially across minority groups. A recent search of the literature shows virtually no empirically controlled comparison studies examining the usage of telehealth with the deaf population. Therefore, the goal of this study to evaluate the efficacy and effectiveness of telehealth in teaching psychoeducational objectives, with special emphasis given to its application to the deaf population.

The next section provides a review of the general telehealth literature with a particular focus on the use of such technology for psychoeducational objectives, followed by a more narrow review that focuses on the usage of telehealth within the deaf population. Next, a summary is presented with a statement of the problem and the various hypotheses within the study. This is then followed by an explication of the study's methodology. The results and discussion are then presented. Finally, the limitations inherent within this study along with recommendations for future research are proposed.

CHAPTER TWO

LITERATURE REVIEW

Criteria for Inclusion in the Literature Review

In order to stay within the focus of the proposed study, specific criteria will be used in determining whether the literature will be worthy of mention in the review. Because one of the aspects of this study is to investigate the usage of telehealth for the purposes of disseminating psychoeducational awareness, a discussion on the historical components of telehealth within the bounds of such educational objectives is fitting here.

The literature review will follow a bottleneck approach in which studies describing the use of telehealth for any type of psychoeducational purposes in the general population will be discussed. Psychoeducational purposes may include various objectives for which psychologically-related services are disseminated, such as, for example, treatment education, clinical consultations, or supervision. The literature review will then narrow down to studies on telehealth use within the deaf population. Due to the limited literature available on telehealth studies with the deaf population, all studies that employ the use of telehealth for psychological-related purposes– whether psychoeducational or psychotherapeutic in nature– will be included.

In order to identify telehealth studies, all dates of the following electronic databases were searched: Academic Search Premier (EBSCO), Education Resources Information Center (ERIC) (EBSCO), Family & Society Studies Worldwide (BioLine), MEDLINE (EBSCO), PsycInfo (EBSCO), Sociological Abstracts (CSA), Brigham Young University Library Catalog, and the Telemedicine Information Exchange (TIE) database. All articles and abstracts related to telehealth were perused and screened for

inclusion in the review; furthermore, articles having reference to the deaf population in relevant areas were included. The reference lists of identified articles were also scanned to locate additional references pertinent to the study.

Psychoeducational Uses of Telehealth: From Past to Present

One of the earliest and most straightforward uses of telehealth has been for increasing the accessibility of continuing psychoeducational instruction (Baer et al., 1997). The literature covers a broad spectrum of telehealth uses for psychoeducational purposes. Some of these uses include demonstrations of clinical interviews to psychiatric students seated in an auditorium, clinical consultations between faculty and students from two separate hospitals, and psychoeducational training to a distant population.

The first use of telehealth for psychoeducational purposes was reported in 1956 by Wittson and Dutton. Anticipating the use of technology to increase teaching effectiveness, the Nebraska Psychiatric Institute (NPI) was built with “camera-cable conduits and a complete television system with sound” (p. 11). The closed-circuit television system (CCTV) cost approximately \$18,000 and included three vidicon cameras, three 17-inch monitor receivers in the control room, and a receiver-projector in the auditorium which projected the television image onto a six-by-seven foot screen. The equipment was maintained by a full-time electronics technician.

NPI psychiatric faculty members lectured using loosely scripted material in order to effectively and coherently demonstrate the unique impact of using CCTV for teaching. Although not formally evaluated, the authors described using the equipment as being highly satisfactory with a number of positive benefits. For example, use of the equipment allowed more students to be taught at one time. Instead of crowding only three to six

students in the back of a one-way mirror to observe a clinical interview, CCTV allowed for nearly 200 students to learn simultaneously with live sound and close-ups of faces (pp. 13-14). The authors described the CCTV application as being effective and recommended its further usage and development.

In 1972, Fisch and Dwyer focused on the use of microwave bidirectional interactive television (IATV) to present psychiatric information to foreign-trained psychiatrists who were preparing for their specialty Board Examinations. The IATV system linked the Massachusetts General Hospital with the Bedford Veterans Administration Hospital, which were approximately twenty miles apart. This system began operation in March of 1970 and was named “Teleconsultation” or “TCX” (p. 913).

The goals for this project were twofold: one, to explore the use of interactive television in teaching, and two, to assess the feasibility of conducting a postgraduate education course originating from a distant teaching hospital for busy foreign-trained clinicians. Interestingly, the authors also cited past difficulties in using other technology within the learning process. These problems occurred with the use of the telephone and one-way audiovisual transmission. More specifically, telephone conference difficulties were related to the subjects’ strong tendency towards inattention or distraction. While the use of one-way audiovisual transmission improved the situation over the telephone condition, the passive nature of the viewing later left participants vulnerable to distractions. The authors were hopeful that interactive television, with instantaneous feedback, would overcome many of these difficulties.

Although not evaluated in a systematic and objective manner, Fisch and Dwyer point out that the following changes appeared to take place through the use of IATV: a)

increased factual knowledge; b) increased skill in literature reviews; c) increased interest in further learning; d) greater confidence in professional abilities; and e) a “therapeutic” response (1972, p. 913). The authors further stated that the latter two items- greater confidence in professional abilities and the therapeutic response- appeared to be related to the small-group experience and to the special relationship that the course members had with the “prestigious” teaching hospital via the course.

In closing, Fisch and Dwyer stated that the intensity of the group response was a surprise particularly in light of previous direct experience with some of the staff members. The authors speculated that interactive television not only allowed the development of a group relationship but also actually intensified this relationship. Unfortunately, this study was based largely on anecdotal evidence. No objective assessment instruments or comparison control groups were used in this study.

One of the first controlled trials to explore the use of telehealth for psychoeducational purposes was conducted in 1992 by McLaren, Ball, Summerfield, Lipsedge, and Watson. A low-cost digitized videoconferencing system (LCVC) was used to link psychiatry students with a member of the psychiatric teaching team at the United Medical and Dental Schools Department of Psychiatry in London. In this study, students gave a clinical presentation to a member of the psychiatric teaching team via two conditions, face-to-face and LCVC. Random assignment determined in which condition students would present first.

A questionnaire was created based on students’ opinions of the important elements in the case presentation. This questionnaire, termed the “Medical Student Teaching Questionnaire” (MSTQ), is a self-report questionnaire in which students are

asked to rate on a four point Likert-type scale (0-3) items, such as the clarity of the tutor's explanations, his attentiveness, if they felt encouraged to ask questions and what they learned about various aspects of psychiatry. A high score on the MSTQ meant that the presentation approximated the ideal presentation from the student's view. The MSTQ was administered to student participants after they had presented cases in both conditions – face-to-face and LCVC. Students also filled out a second seven-item self-report questionnaire that was designed to elicit their views on using the link. This questionnaire was termed the “MSFOS” and was developed from questionnaires used to determine general user responses to the link. The MSTQ and MSFOS were administered to student subjects after they had presented cases in both conditions – face-to-face and LCVC.

Eight different students and three different psychiatrists participated in the study. No one who was asked to participate refused. Nine face-to-face and eight LCVC presentations were completed, with six students completing both conditions. The results for the MSTQ showed greater spread in the face-to-face condition (standard deviation (std) = 3.04) versus the LCVC (std = .76). The mean, although slightly higher for the face-to-face condition, was not significant on a two-tailed paired t-test ($p = .5$) [*sic*]. Students returned six MSFOS questionnaires from the LCVC condition and the results indicated a high level of satisfaction. The highest scoring negative item, with a mean of 2.2 out of 5, was “feeling self-conscious.” Interestingly, to the question, “did the equipment interfere with your ability to give your presentation?” the mean was 1 out of 5 (“not at all”).

The results of this study appear to indicate that the LCVC and face-to-face conditions are equal communication mediums. However, caution must be taken in

interpreting the results. Due to the small sample size, statistical power is inadequate to detect significant group differences. Moreover, some of the procedures used in the study were somewhat nebulous and difficult to understand. For example, the development of the MSFOS questionnaire is not thoroughly explained. Reactions from members of the psychiatric teaching team were also not evaluated.

In order to address long standing difficulties with attracting mental health care providers to disparate rural areas, several studies were conducted that investigated the feasibility of training mental health professionals located in these areas. Some of the factors inhibiting mental health professionals from practicing in rural areas include “professional isolation, difficulty in maintaining professional knowledge, difficulty in developing a career path, poor peer consultation and having to travel long distances” (Andrew, 1990; Emmerson, Brown, & Whiteford, 1995; Huntley, 1991 as cited in D’Souza, 2000, p. 187).

D’Souza (2000) focused on training and education to foster improved recruitment and retention of community mental health workers and general practitioners. In this study, Picture Tel videoconferencing units were located in thirty-three health facilities throughout rural and remote areas of South Australia. Each of these facilities were connected by ISDN lines at 128 kbit/s. Overhead transparencies, 35 mm slides and PowerPoint presentations were also used to supplement the educational and clinical modules. These modules were developed in consultation with the relevant professionals and included the following topic areas: 1) depression and suicidal ideation in psychosis; 2) the discontinuation syndrome with selective serotonin reuptake inhibitors – identifying and managing it; 3) management of schizophrenia; 4) the management of first psychosis;

5) crossing over from typical to atypical antipsychotics; 6) cognitive-behaviour therapy applied to psychiatric disorders; 7) overview of obsessive-compulsive disorder; and 8) managing the borderline personality disorder. The above named modules were delivered in sixty-minute blocks, allowing time for interactive discussion as well as for secondary consultation (p.188).

The sample participants included forty-six community mental health workers and twenty general practitioners. The author delivered most of the services to the rural areas. Assessment questionnaires were developed to evaluate the satisfaction and outcomes with the use of the telemedicine service. The assessment questionnaire was readministered four days later to gain test-retest reliability scores from the sample of community mental health workers and general practitioners. A test-retest reliability coefficient of .76 was obtained (d.f. = 20, $P < 0.001$). Satisfaction was assessed on a five-point scale ranging from 1 = unsatisfied to 5 = satisfied.

The results indicated that there was high satisfaction with the use of the telemedicine service towards fulfilling professional and academic needs with regard to mental health. The mean scores were 4.5 for the community mental health workers and 4.1 for the general practitioners (p. 188). The service also helped to improve confidence and competence in managing mental illness. The study concluded that telemedicine appeared to have potential to play an important role in the process of attracting and retaining health professionals in rural areas. While satisfaction studies are helpful in evaluating the incipient educational uses of telehealth, comparison studies are paramount. The study also did not evaluate satisfaction with regards to the service providers.

In another study evaluating solutions to the shortage of health professionals in rural areas, a course in cognitive behavior therapy (CBT) was developed specifically for delivery via videoconferencing (Rees & Gillam, 2001). The study was conducted in rural Western Australia with twelve participants. Eleven of the participants completed a pre- and post-training knowledge test with results indicating a significant improvement in their knowledge of CBT following training. A satisfaction questionnaire was also filled out by ten participants with a majority indicating they were satisfied with the training they had received. Participants also indicated that the CBT training had given them greater confidence in their ability to use CBT with their patients. No further information on this study could be obtained.

In 2002, Burton, Stanley, & Ireson investigated the use of telehealth to deliver training on sexual abuse to physicians and mental health professionals living in the rural areas of Kentucky. The authors reported the number of sexual abuse cases identified increased from 77 to 83 in the first year and to a whopping 339 in the second year for these rural areas (p. 10). A survey given to the users of the telehealth equipment indicated that the technology supported clinical decision making, was useful, and easy to use. Unfortunately, this study did not present any quantitative data from the surveys.

In summary, telehealth appears to be readily adaptable for disseminating psychoeducational topics at a distance within the general population although no firm conclusions can be drawn without comparisons to a control condition or quantitative results. The evidence, to date, appears to be mainly anecdotal. Researchers have called for further studies examining the feasibility and substitutability of telehealth for

disseminating psychoeducational objectives (Baer et al., 1997; Hilty et al., 2003; Wood, Miller, & Hargrove, 2005; see also Hilty, Servis, Nesbitt, & Hales, 1999).

Use of Telehealth with the Deaf Population

Research on the efficacy and efficiency of telehealth – whether for psychoeducational or psychotherapy purposes – within the deaf population appears to be almost nonexistent. While a thorough literature search in this area found several articles that gave a description of various telehealth programs serving the deaf population and the propitiousness of such technology alleviating inaccessibility to mental health services (e.g., Edwards, 2003; Hamerdinger, 2004; “Indiana follows,” 1997; Munro-Ludders et al., 2004), only five research articles dealt with the use of such technology within this population. One of the earliest published articles found that focuses on the use of telehealth with the deaf population is an article by Afrin and Critchfield (1997) entitled *Low-Cost Telepsychiatry for the Deaf in South Carolina*. In this article, the cost savings and efficiency of using telehealth technology with the deaf population is discussed. Before implementation of the technology, Dr. Afrin, a psychiatrist, had to travel extensively (up to eight hours per day) to provide mental health services to deaf and hard-of-hearing individuals dispersed throughout the state of South Carolina. After setting up the technology, which the authors described as being “well suited to serving deaf clients since their principal mode of communication is visual” (p. 901), Dr. Afrin no longer had to travel to see clients at various sites. Hours that were once consumed by travel are now available for patient care, with clients being seen more frequently and in longer sessions. Approximate savings on travel time alone have been estimated at \$28,000 in the first two years (p. 901).

Afrin and Critchfield pointed out that all users of the technology had expressed generally high levels of satisfaction with the system. However, there is no mention of what outcome measures were used to indicate satisfaction. There is also no indication of the number of participants who used the technology. The authors acknowledged in their article that rigorous quantitative measures of success were lacking.

Johnson (2004) described the program development of a videoconferencing model to serve a spectrum of needs for the deaf population in the state of Utah (Johnson, 2004). In addition to mental health counseling, other applications of the technology included mentoring for sign language interpreters, vocational rehabilitation, case management, education, and interpreting services. The applications were evaluated via a survey administered during the first year of the pilot project. The survey was administered during three 10-day periods of usage throughout the year and evaluated issues that included clarity of communication, uses of the model, and overall satisfaction with the model and services. Fifty-three surveys were given and all fifty-three surveys were completed and returned (p. 34).

The author stated that users of the videoconferencing equipment were generally happy with using the technology. Sample quotes from the participants included:

This was so much better than using the phone. Was able to involve so many people in the planning process [*sic*]. People involved included hearing, Deaf, and hard of hearing. Planning would have been impossible if this were done over a phone or regular tty. (p. 35)

I have to admit that I was somewhat skeptical about using this equipment. After using it, I think it is terrific! (p. 35)

I would love to see this equipment set up everywhere and not just a few select locations. This would be wonderful for establishing distance education. (p. 35)

The only negative comments on the use of the technology were concerning the occasional technical difficulties with the equipment. Again, unfortunately, quantitative results and measures are lacking and there is no description as to the development of the survey. Subject demographics, such as gender, whether the subject was deaf or hearing, or for which application the subject was using the technology (mental health counseling, interpreting, case management, etc.) is not distinguished. The paper concluded in a non-evaluative manner that the technology application saved time, money, and travel.

The third article related to the use of telehealth with the deaf population is a case study done by Lopez et al. (2004) on a patient that had been referred to the telepsychiatry clinic in the Arizona Telemedicine Program (ATP). The patient, a forty-one year-old deaf Native American woman, lived in a rural community in which services for the hearing impaired are not readily accessible. Although fluent in ASL, the patient found very few persons in her community who could sign. The patient reported a history of “depression characterized by increased fatigue, poor appetite, social isolation, and tearfulness” (p. 390). Prior attempts to alleviate these symptoms were unsuccessful because of the inability of the patient to communicate with the physician in the area.

The telepsychiatry clinic hired an ASL interpreter at its hubsite in order to facilitate the clinical interaction between the specialist and the patient. In the article, Lopez et al. describe the first visit—

The patient sat quietly during the first visit when the telepsychiatrist and the interpreter appeared on the television monitor. She nodded when the specialist

waived [sic], smiled when the interpreter signed a greeting into the camera, but made no effort to reply. The interpreter asked if everything was all right. The patient hesitantly signed, “You can see me?” When the interpreter relied [sic], “yes,” the patient’s hands flew into action. For more than an hour, she conversed freely with both interpreter and specialist. Her mood was noticeably improved. “This is the first time I’ve been able to express how I feel,” she told the specialist. “The people here tried to help but they couldn’t. They weren’t able to understand me.” (pp. 390-391)

Based on the initial evaluation, the patient was started on sertraline (Zoloft) and follow-up teleconsultations with the ASL interpreter were scheduled. In the end, the patient underwent five telepsychiatric consultations approximately 2-4 weeks apart. Each consultation lasted one hour. According to the article, the patient “experienced improvement in function with improved sleep, appetite, and mood and an increased affective range with decreased rage” (p. 391). A follow up report ten months after the initial evaluation found that the patient continued to do well.

While the case study described above is a good qualitative description of a telehealth consultation with a deaf individual, there are obvious problems inherent within the study. There were no dependent measures taken on the patient; also, the results may not be generalizable due to the single individual anecdotal design of the study.

The penultimate article, which was presented as a PowerPoint presentation at a conference, examined the use of telehealth technology to provide health services to deaf individuals in Canada (Hughes, Hudgins, & Macdougall, 2004). In this study, questionnaires were administered to gather data on the usability of videoconferencing

technology from three different perspectives: the ASL interpreter, client, and health professional/information provider. Questionnaires were completed after the simulation of a typical physical, mental, or social health scenario using the technology, with the questionnaire focus being on communication. There were four interpreters, fourteen health care/information providers, and twenty-four deaf clients who participated in the study (see PowerPoint slides 22, 23 & 29).

Hughes et al. (2004) found that the majority ($\geq 97.5\%$) of all participants could understand and felt understood when using the technology (see PowerPoint slides 30-35). Moreover, the majority of qualitative responses from participants was positive. There was one session which was reported by an interpreter to have inadequate video quality. This same interpreter reported frustrations in two other sessions with an occupational therapist in which the field of vision was restricted (see PowerPoint slide 36). No description of the reliability of the questionnaires used in the study is provided. There is also no quantitative data presented on the travel and resource savings that were indicated in the study.

The fifth and final article, which appears to be the first controlled comparison study investigating the use of videoconferencing with the deaf population, was conducted by Gournaris and Leigh (2004). In this study, Doherty-Sneddon et al.'s 1997 study was replicated. The Doherty-Sneddon study was conducted with a general hearing sample population and had individuals describe map directions to subjects through face-to-face and video-mediated communication (VMC) mediums to compare dialogue interaction. Doherty-Sneddon et al. concluded that high quality VMC did not deliver the same

efficiency benefits as face-to-face communication, in terms of listener understanding and conversational flow (p. 122).

Gournaris and Leigh (2004) accommodated deaf participants ($N = 40$) by having individuals describe map directions in ASL (p. 27). In analyzing the dialogue interaction from the map task, Gournaris and Leigh found no significant difference in the length of dialogue between the face-to-face (F2F) and VMC conditions. The only significant communication breakdown variable that was observed was the fact that participants in the VMC condition informed the instructor more often that he or she was following the dialogue (F2F: $M = 6.75$, $SD = 3.46$; VMC: $M = 9.07$, $SD = 4.57$); significance was indicated with an ANOVA ($p = .001$) (p. 31). The authors attributed such observations to the participants' sensitivity and need to confirm that the technology was facilitating communication (p. 36). Map task deviations made by participants in both conditions were nearly identical, suggesting that instructions were understood and appropriately followed in both conditions (p. 37).

In addition to analyzing the dialogue interaction, a user feedback form was created and administered to assess participants' experience in the study. On this form, participants were asked to rate each statement on a ten-point scale from 1 (not at all or strongly disagree) to 10 (very well or strongly agree) (p. 29). Some of the findings of significance from this questionnaire included the fact that participants believed that reading the instructor's finger spelling in the F2F condition was better than the VMC condition and overall communication was more natural in the F2F condition. It is of interest to note that while half of the participants believed that F2F communication was more natural than VMC, the other half believed that both conditions were equally natural

(No Difference = 47.5%; F2F = 50%; VMC = 2.5%; $p = .000$ as indicated by a Chi Square analysis) (p. 35). The authors proposed that with greater exposure to VMC, the sense of naturalness might increase. Gournaris and Leigh further stated that VMC, with no transmission lags, no loss of synchronicity, and broadcast-quality image at 30 frames per second, the potential for equivalence with F2F communication is enhanced. The authors concluded that their findings support the use of video technology for deaf ASL users who rely solely on visual avenues for communication (p. 38).

There are several limitations inherent within the above study. First, the authors acknowledged that the sample included only participants from Gallaudet University, thus limiting the generalizability of the study. There was also no description of the validity of the self-created questionnaire used in the study; moreover, no standardized dependent measures were used. The VMC condition was carried out with the participants being separated by a barrier. In a real world setting, individuals would be separated across distance, increasing the chances of delays in video transmission, and consequently, creating a natural experimental environment. Regardless of the inherent limitations and given the paucity of research in the area of telehealth consultations with the deaf population, this study did well in taking a step in a new direction.

Summary and Statement of the Problem

As can be deduced from the above literature review, we have only a limited knowledge concerning the efficacy and perceived utility of using telehealth technology to disseminate psychoeducational objectives. The influence of special minority groups or cultural factors on using telehealth is further unsubstantiated by the dearth of scientific evidence available. Especially within the deaf population, research or services in

providing mental health access to deaf people is decades behind where it should be (see Brauer, Marcus, & Morton, 1999 as cited in Munro-Ludders et al., 2004; Devinney & Murphy, 2002; Steinberg, Sullivan, & Loew, 1998).

The present study, therefore, explores an avenue of technology that may alleviate somewhat the absence of appropriate mental health accommodations within the deaf population. Indeed, the deaf population may remain underserved if significant changes do not take place with current or traditional service delivery methods (Santos, 2000). Part of the solution to alleviating inaccessibility to mental health services within the deaf population includes not only improving competent manpower to reach this widely dispersed population, but in increasing access to necessary education or knowledge about mental health treatment. Conversations, whether normal or overheard, are easy sources of information for hearing people, but they are generally inaccessible for the deaf. For these and other reasons, the deaf population may not have the necessary education or knowledge to obtain needed mental health treatment. Given society's generally reluctant approach in rectifying information access inequities in the deaf population, the deaf have to put in more effort to acquire this knowledge (Pollard, 1998; see also Ouellette et al., n.d.). The deaf population may even stand to benefit from telehealth more so than the regular population because it not only makes access to health care convenient as it may within the general population, but it makes access possible for the deaf population (Heumann, 2000 as cited in Johnson, 2004). Because telehealth has been hailed as a possible panacea to the problem of inaccessibility to mental health care, it is the goal of this study to investigate the efficacy and effectiveness of using such technology to disseminate psychoeducational topics within the deaf population.

Interestingly, but not surprisingly, it has been noted in the literature that deaf people have poorer health than that of the general population (Barnett & Franks, 2002 as cited in Steinberg, Wiggins, Barmada, & Sullivan, 2002). The deaf population has been found to have significantly higher prevalence rates of depression than that of the general population (Leigh & Anthony-Tolbert, 2001; Leigh, Robins, Welkowitz, & Bond, 1989; Watt & Davis, 1991). Higher prevalence rates of depression within the deaf population may be the result of a lack of mental health resources, knowledge, or support on the signs and symptoms of depression. Based on these research findings, the subject of depression is an appropriate psychoeducational topic to use in exploring the feasibility and effectiveness of using telehealth technology within this population. In attempting this exploration, it is hoped that a step will be made in improving the overall quality of life for this population, and, in its repercussions, the general population.

CHAPTER THREE

METHOD

The aim of this study is to assess the feasibility of using telehealth technology within the deaf population to disseminate psychoeducational objectives. Effectiveness and satisfaction with such technology will also be assessed. In compliance with literature recommendations, a comparison type study will be conducted (Bishop, O'Reilly, Maddox, & Hutchinson, 2002; Folen et al., 2005; Mair & Whitten, 2000; Williams et al., 2001).

In describing the methodology for this study, the general goals or questions that this study seeks to answer will first be outlined. Next, a description of the research design will be presented. The criteria for participants within the study, including all research personnel, will then be explicated. This will be followed by a description of the setting and apparatuses for the study along with the dependent measures that will be used. This chapter will then conclude with a detailed account of the study procedures.

Study Questions

In creating such a comparison type study, two different groups will be evaluated, with the focus on obtaining information to the following questions or aspects of telehealth in its use with the deaf population:

- 1) Is telehealth considered an effective means of providing and receiving health education or services?
- 2) Do users of telehealth indicate satisfaction with the use of the technology?
- 3) Is telehealth considered to be cost-effective compared to traditional methods of health services?

4) What are the limitations, if any, in the use of telehealth with the deaf population?

The above questions will be reworded and presented as research and null hypotheses in the next chapter of this study. All statistical testing procedures used nondirectional or two-tailed tests. A between subjects pretest-posttest crossover control group design was utilized in order to delineate answers to these questions. A description of the research design is presented below.

Design

In creating a between subjects pretest-posttest crossover control group design, two different groups or conditions were implemented. The first condition will be termed the “telehealth” condition. The telehealth condition consisted of deaf participants who viewed a psychoeducational lecture on depression via telehealth. For the comparison control group, an “attention placebo” condition was created, which included individuals who received the same lecture as the telehealth condition, but the lecture was administered in a printed literature format.

Both the telehealth and attention placebo conditions received a pretest and posttest “depression knowledge” questionnaire designed to assess participants’ current level of knowledge with respect to the signs and symptoms of various aspects of depression. Additionally, the Beck Depression Inventory-II and the Beck Hopelessness Scale were administered once before the psychoeducational lecture, and again one week later. All participants subsequently had the opportunity to participate in the telehealth and attention placebo condition by way of the crossover design implemented in this study.

Following the administration of all pretest-posttest knowledge depression measures, a satisfaction questionnaire was administered to all research participants. That is, participants in the attention placebo and telehealth conditions, along with the mental health professional (MHP) who conducted the psychoeducational lecture, completed a satisfaction questionnaire following each lecture session. In addition to satisfaction, the participants and MHP within the telehealth group filled out a cost effectiveness measure.

The between subjects pretest-posttest crossover control group design is symbolized in the diagram below (R denotes subjects are assigned randomly; T denotes the telehealth group; C denotes the attention placebo control group; Pr and Po denotes pretest and posttest assessments, respectively; and X denotes the intervention or psychoeducational lecture, which is signed for the telehealth condition [A] and administered in printed literature format for the attention placebo control condition [B]):

$$\begin{array}{cccccccccc} R & T & Pr1 & XA & Po1 & C & Pr2 & XB & Po2 & Po3 \\ R & C & Pr1 & XB & Po1 & T & Pr2 & XA & Po2 & Po3 \end{array}$$

Based on the results of the power analysis, a sample size of fifty-five participants were included in the study and randomly assigned into both conditions. The results of the power analysis can be found in Table 1 of Appendix A. Random assignment took place by alternating each individual into each group as he or she expressed interest in participating in the study.

With regards to the statistical analyses, differences between the two conditions with respect to overall depression knowledge scores and significance of pretest posttest knowledge change scores were obtained. Satisfaction between participants was then compared across the telehealth and attention placebo control conditions. Following,

satisfaction was compared between the participants in the telehealth condition and the MHP who conducted the lecture. Cost effectiveness within the telehealth condition and MHP was also analyzed. Finally, the Beck Depression Inventory-II and Beck Hopelessness Scale scores were evaluated to determine any significant change scores over the one-week period.

Thus, this design makes for a total of three independent variables and five dependent variables. The three independent variables include: 1) Telehealth condition; 2) Attention placebo control condition; and 3) MHP lecturer condition. The five dependent variables are as follows: 1) Level of knowledge gained scores (or depression knowledge scores); 2) Satisfaction scores 3) Cost effectiveness data; 4) Beck Depression Inventory-II scores; and 5) Beck Hopelessness Scale scores.

Participants

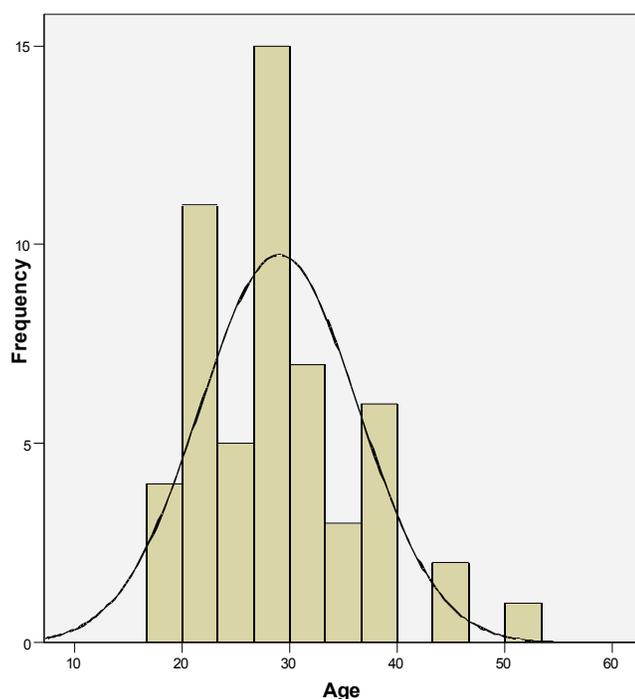
The participants for this study were recruited from the deaf population residing from around the state of Utah via the posting of advertisements in areas around the state where deaf individuals are known to congregate; moreover, a variety of electronic distribution lists were used, including various college/university lists as well as deaf information/news lists. The announcement for participation in the study can be found in Appendix B. As mentioned, based on the results of the power analysis, a sample size of at least fifty participants was sought for the study. Adult males and females between the ages of 17-89 were invited to participate in the study.

There were a total of fifty-five deaf and hard-of-hearing participants in the study. Interestingly, almost an equal number of males and females participated in the study (26 males [47%] and 29 females [52%]). The mean age of participants was 29 with an age

range of 17-52 ($SD = 7.37$). Figure 1 shows the age range and frequencies for study participants.

Figure 1

Age Range and Frequencies for Study Participants



Demographic characteristics reported ethnic identities of 42 Caucasian (76%), 2 African American (3%), 1 Native American (1%), 8 Hispanic (14%), and 2 “other” (3%). The sample consisted of 17 individuals who had completed High School or a GED as his or her highest level of education (31%), while 9 had completed an Associate’s degree (16%), 8 a Bachelor’s degree (15%), 4 a Master’s degree (7%), 16 had “some college,” (29%) and 1 “other” (1.8%).

Before participation in any stage of the research, participants received an informed consent form that was signed and dated. The consent form was monitored by

the Institutional Review Board at Brigham Young University (BYU). A copy of the informed consent form can be found in Appendix C.

Exclusion criteria. Due to the constricted nature of the deaf population, criteria for exclusion from the study was minimal; participants were excluded from the study only: a) if they did not have some form of identifiable hearing loss; or b) if they were not able to communicate in American Sign Language (ASL). Exclusion criteria were monitored by having participants indicate on the consent form that he or she had a hearing loss and could communicate in ASL.

Research personnel: Recruitment and training. In order to carry out research procedures, a number of assistants were recruited. Following is a description of the various personnel that were necessary to successfully carry out research procedures. These personnel included: research assistants, interpreters, and the MHP who conducted the psychoeducational lectures.

Five research assistants (RAs) who were fluent with ASL were recruited to assist with the study. RAs were available to assist with quality assurance for all phases of the experiment. Specifically, RAs helped to set up and ensure that the experiment was run in an organized manner – prior to, during, and after the experiment; moreover, RAs were available to answer any comments or questions research participants had. RAs were briefed on the essential components of the experiment prior to assisting with the research. Two RAs were specifically assigned to administer consent forms and dependent measure questionnaires to each of the groups. To ensure consistency in the way the RAs conducted administrative matters, both RAs were given transcripts on how to administer all measures prior to the experiment day. These transcripts can be found in Appendix D.

For reasons described in the dependent measures section of this chapter, four sign language interpreters assisted in signing questions from the various dependent measures at the request of the participants. Two sign language interpreters were available in the telehealth room and two in the attention place control condition room for this purpose. The interpreters were provided by the BYU University Accessibility Center.

The four interpreters assisting with the experiment were instructed to only sign dependent measure questions requested by the deaf subjects who indicated a need for assistance with the questionnaire. All questionnaires were given to the four interpreters prior to the experiment to allow time for the interpreters to prepare and familiarize themselves with the content of the measures or to ask questions about how to sign specific items on the questionnaires. The interpreters were told to sign the questions along with the scaling choices that were provided on the questionnaire (e.g. 1 - Very Strongly Disagree to 7 - Very Strongly Agree).

A MHP was also recruited to present the psychoeducational lectures on depression. Training on conducting the psychoeducational lecture was provided to the recruited MHP. Transcripts of the psychoeducational lecture were given to the MHP a few weeks prior to the experiment. The MHP was instructed to peruse the transcript and begin preparing to fluently conduct the lecture(s). An ASL interpreter was also recruited and given the psychoeducational transcripts a few weeks prior to the experiment. The interpreter rehearsed the lecture before three other interpreters and a personal mentor, in order to receive feedback on how to best convey various concepts into ASL. Given the dearth of MHPs available who can themselves communicate in ASL, having the lecture signed by an interpreter helped make the study more generalizable to real-world settings

(Bahan et al., 1996). Prior to conducting the lecture, the MHP and ASL interpreter rehearsed the lecture. The rehearsal session provided ample opportunity for the MHP and ASL interpreter to work together in making the presentation as lucid and comprehensible as possible.

Compensation for participation. To provide an extra incentive for participation in the research, participants were compensated twenty dollars upon completion of all questionnaires on the first day of the study. Participants who returned for the second day of the study – one week later – were remunerated ten dollars upon completion of all questionnaires that day.

Setting and Apparatus

Participants were randomly assigned into one of two rooms at the Robert G. Sanderson Community Center for the Deaf and Hard of Hearing (SCCDHH), located in Taylorsville, UT. The rooms were distant from each other so as to provide a clear demarcation between the two conditions. On the second day of the experiment, handouts and brochures on depression and related mental health issues were placed on a large table in the lobby for participants to collect and peruse. The MHP conducted the lecture from the BYU campus in Provo, Utah – which is approximately forty miles south of SCCDHH.

The video conferencing equipment consisted of two Polycom ViewStation FX™ cameras on Sony® Trinitron® Color TVs. The telehealth end of the site had two TVs; one TV displayed the screen that the receiving end was seeing, while the other screen displayed the MHP lecturer.

Two psychoeducational lectures concerning the topic of depression were created. Participants in the attention placebo control condition received these printed handouts of the psychoeducational lectures. The handouts were approximately nine pages each. The MHP who conducted the lecture followed these same transcripts in delivering the lecture from the telehealth condition.

The lectures were adapted from the National Depression Screening Day (2004) regular lecture to match a deaf audience. The first lecture introduced and explained some of the basic features of depression. The second lecture described the signs, symptoms, and treatment of depression. Each lecture was designed to last approximately twenty minutes with a brief five to ten minute question and answer session following. These procedures were cycled through two different times on the same day, once at 12 o'clock noon and again at 6 o'clock pm. A copy of both psychoeducational lectures can be found in Appendixes E and F. For the second day of the study, subjects were asked to return one week later, between 12 and 8 p.m., to complete the remaining questionnaires. Following completion of the first day of the study, a small handout flyer with the return details was given to each subject. This flyer can be found in Appendix G.

Dependent Measures

In conducting a study within the deaf population, there are a number of challenges presented. These challenges relate to obtaining valid and reliable outcome data from deaf samples. An exploration of some of the difficulties in obtaining research data within the deaf population will be briefly examined; moreover, a solution to these difficulties, in order to carry out the purposes of this study, is proposed. Following, a discussion of each of the dependent measures that will be employed in the study and the relevant

psychometric properties inherent within these measures will be explored. Measures will be discussed in the order in which they will be used.

Dependent measures within the deaf population: A caveat. Historically, psychological research within the deaf population has been hampered by the difficulties of attaining objective measures given the linguistic problems many deaf persons have with the English language (Leigh, Robbins, & Welkowitz, 1988). Although the average reading level within the deaf population is at approximately the fourth grade level, the range of English skills may vary widely (Marschark, 1993; Moores, 2001 as cited in Leigh & Anthony-Tolbert, 2001; see also Steinberg et al., 1998; Holt, 1994). Moreover, the primary language of many deaf individuals is ASL, a visual mode of communication which differs grammatically and syntactically from English (Moores as cited in Leigh & Anthony-Tolbert).

Given the disparate linguistic difficulties inherent within the deaf population, extra precautions may be necessary in order to ensure that the objective data gathered is valid. Such precautionary measures in previous studies have included altering standard psychological instruments either through written English revisions (e.g., Leigh et al., 1988) or translations into ASL videotape (e.g., Mcghee, 1996), some with more success than others.

To address the difficulties in attaining measurement outcome within the deaf population, this study employed the use of four sign language interpreters. Specifically, two interpreters were available within the telehealth condition and two within the attention placebo control condition. The interpreters were available to sign items on the

questionnaires in ASL to aid in the deaf subject's comprehension of measurement items. The interpreter signed only those items in which the deaf subjects requested assistance.

Another difficulty in garnering outcome data within the deaf population relates to the attainment of psychometric data for newly devised measures that are specific to the population. Given the limited sample size of the deaf population in a single state, it may not be viable to gather evidence of the validity and reliability properties of a newly created test or to cross-validate existing psychological measures. This is especially true if the same test is to be used for a study within the same sample population. For this reason, and to the extent possible, dependent measures that have already been examined for psychometric soundness were used in this study. Moreover, all measures used in this study were assessed for reliability using Cronbach's alpha. Other relevant item analysis measures were also employed to ensure validity of the measures. Following is a discussion of each of the dependent measures that were employed in the study, in the sequence they were used.

Assessing depression and hopelessness. In order to assess current levels of depression as well as the possible therapeutic effects of the psychoeducational depression lecture, the Beck Depression Inventory-II (BDI-II) (Beck, Steer, & Brown, 1996) was administered prior to the first psychoeducational lecture, and again, one week later to gain posttest scores. It should be recognized, however, that psychoeducational lectures, per se, are not considered a bona fide therapeutic intervention. Consequently, it was expected that any remediation in depression based on the BDI-II retest scores would be minimal at best.

In a study examining the viability of the BDI-II with the deaf population, Leigh and Anthony-Tolbert (2001) reported a split-half reliability coefficient of .76 for a sample of sixty-three deaf participants. Cronbach's alpha internal consistency was reported to be .88 for this same sample (p. 196). The BDI-II thus appears to be a more reliable instrument than the modified and rewritten BDI-R (Leigh et al., 1988) which was also cross validated with the deaf population and attained an internal consistency coefficient alpha of .66 (p. 729). A copy of the BDI-II can be found in Appendix H.

The Beck Hopelessness Scale (BHS) (Beck, Weissman, Lester, & Trexler, 1974) was used to corroborate the BDI-II in providing an additional picture of any effects the psychoeducational lecture may have on participants' life outlook. Like the BDI-II, the BHS was administered prior to the first psychoeducational lecture, and again, one week later.

Stotland (1969 as cited in Beck & Steer, 1988) stated that part of the cognitive schema of hopeless individuals was that (1) nothing will turn out right for them, (2) they will never succeed at what they attempt to do, (3) their important goals can never be attained, and (4) their worst problems will never be solved. Given that one of the aims of the psychoeducational lecture is to educate individuals on the signs, symptoms and various treatment options for depression, it was interesting to see whether or not education in the area of depression might help to remediate hopelessness thoughts. As with the BDI-II, because psychoeducational lectures are not considered a bona fide therapeutic intervention, any remediation in BHS scores was expected to be minimal at best.

Previous studies have shown hopelessness to be associated with depression (Beck, Riskind, Brown, & Steer, 1988; Nimeus, Traskman-Bendz, & Alsen, 1997; Prezant & Neimeyer, 1988; Whisman, Miller, Norman, & Keitner, 1995 as cited in Haatainen et al., 2004); furthermore, hopelessness has been shown to be a predictor of depression in non-clinical samples (Alford, Lester, Patel, Buchanan, Giunta, 1995; Rholes, Riskind, & Neville, 1985 as cited in Haatainen et al.).

The BHS has a Kuder-Richardson internal consistency coefficient of .87 for individuals with Dysthymic Disorder (Beck & Steer, 1988, p. 12). A one week test-retest reliability of .66 (Beck & Steer, p. 12) has also been demonstrated with the BHS. Concurrent validity between the BHS and the BDI-II for individuals with Dysthymic Disorder indicate a correlation coefficient of .64 (Beck & Steer, p. 14). Unfortunately, there are no normative studies of the BHS within the deaf population. A copy of the BHS can be found in Appendix I.

Evaluating knowledge of depression. One of the primary goals of this study is to evaluate the feasibility and effectiveness of disseminating psychoeducational objectives to the deaf population by means of telehealth. This was assessed via a pre- and post-lecture knowledge test on depression. This test was created using a rational or deductive approach in which items were developed based on the essential features of the psychoeducational lecture and was created as selected response multiple-choice tests. Some items were also adapted from existing quizzes, exams, and test banks of psychology textbooks, as well as information resources from the Internet.

For the second psychoeducational lecture, which expounds on the topic of depression, another knowledge test of depression was created. This second test

incorporated the new content of the second lecture. An alternate forms test was created for both psychoeducational lectures in which the items from the original test were randomly shuffled from their original numbered order. This alternate forms test was used to assess post-lecture knowledge. There are 25 items on both the first and second depression knowledge pretest and posttest with possible scores ranging from 0 to 25. A copy of the depression knowledge tests can be found in Appendix J.

Due to the limited special population characteristics of the deaf population in the state of Utah, it was not feasible to validate the depression knowledge measures within the same population. However, in order to verify the reliability and validity of the instruments and to obtain relevant psychometric data, the questionnaires were validated on a sample of hearing university undergraduate students. Below is a description of the subjects, procedures, results, and discussion concerning the validation of the depression knowledge questionnaires. Following the description of the validation process for the depression knowledge questionnaires below, the discussion continues concerning each of the dependent measures that were employed in the study, in the sequence they were used.

Validation of Depression Knowledge Questionnaires

Participants

Prior to the administration of the depression knowledge questionnaires to the deaf sample, the questionnaires were administered to university undergraduates in a core psychology class ($N = 17$). There were 5 male and 12 female participants who participated in the study. Subjects received extra credit for their participation in the test validation process.

Procedures

Participants were asked to fill out the first pretest depression knowledge questionnaire and hand it in when completed. Following this first step, subjects were asked to peruse the first printed literature handout on depression. After completion of their reading, subjects were given the first posttest depression knowledge questionnaire. It should be noted that since the sample of university undergraduates did not include any deaf individuals, the printed literature handouts were not considered an attention placebo apparatus.

The above steps were then repeated for the second pretest, literature handout, and posttest depression knowledge questionnaires. Participants were instructed to write feedback comments as deemed necessary on any of the questionnaires or literature handouts. Participants were also asked to fill out a brief survey containing questions concerning the face and content validity of the items on the depression knowledge questionnaire and to suggest items that might be candidates for revision or rejection. A copy of the survey can be found in the Appendix K.

Results

The majority of participants indicated that the items on the depression knowledge questionnaires had good face validity. Participants further indicated that the items appeared to adequately measure the domain it was intended to measure; in other words, the questionnaires had good content validity in measuring knowledge of depression.

Item analyses of the first depression knowledge questionnaire indicated the average item difficulty index to be .70 ($M = 17.5$ out of 25 possible; $SD = 1.97$). Internal consistency reliability as measured by Cronbach's alpha was reported at .08. Following

the reading of the literature handouts, the posttest demonstrated an expected higher mean score and an easier average item difficulty index ($d = .96$; $M = 24.1$; $SD = 1.18$; $\alpha = .45$). The standard error of measurement also decreased from pretest to posttest ($SEM_{pretest1} = 1.89$; $SEM_{posttest1} = .88$).

The second depression knowledge questionnaire pretest demonstrated an average item difficulty index of $.79$ ($M = 19.8$; $SD = 2.65$; $\alpha = .57$). Following the reading of the second literature handouts that expounded on other areas of depression, the posttest again demonstrated an expected higher mean score and an easier average item difficulty index ($d = .93$; $M = 23.2$; $SD = .88$; $\alpha = -.86$). Again, there was a demonstrated decrease in the standard error of measurement from pretest to posttest for this second depression knowledge questionnaire ($SEM_{pretest2} = 1.75$; $SEM_{posttest2} = 1.20$).

Some subjects gave feedback on various items on the questionnaires and literature handouts. Where deemed necessary, these areas were revised for clarity. Moreover, an individual item analysis was conducted on all items from both pretest and posttest depression knowledge questionnaires. Those items that indicated psychometric difficulties were either revised or dropped.

Discussion

It was theorized that depression knowledge scores would increase following an educational intervention between pretest and posttest. As predicted by theory, the mean score increased from the pretest to the posttest on both the first and second knowledge depression questionnaires. Moreover, the average item difficulty index also increased from the pretest to the posttest for both the first and second knowledge depression questionnaires, indicating that the items were becoming easier or that a higher proportion

of people were passing the items. This demonstrated increase in test scores over time can be considered to be evidence for the construct validity of the depression knowledge questionnaires.

The standard deviation also decreased from both depression knowledge pretests and posttests, signifying less variability in scoring among subjects. Moreover, internal consistency reliability increased from pretest to posttest on both depression knowledge tests, indicating evidence of homogeneity amongst items in measuring the construct of depression knowledge. The decrease in the standard error of measurement from pretest to posttest on both depression knowledge tests can be considered indicative of an increase in the precision of the instrument in measuring an individual's score. In other words, an individual's score would be less likely to deviate from his or her true score if the individual were to take the same test an infinite number of times. Tables 2 through 5 and Figures 2 through 5 found in Appendix L display all item analysis statistics and score distribution histograms concerning the validation of the depression knowledge questionnaires.

Continuation of Dependent Measures Discussion

Satisfaction scales. A revised version of the Client Satisfaction Scale (CSS) (Tracey & Dundon, 1988) that was implemented in another telehealth study (Schneider, 2000) was used to assess participant satisfaction for the telehealth and the attention placebo groups. In the Schneider study, a revised CSS was used to investigate the effectiveness of telehealth as a medium for conducting psychotherapy. In that study, Schneider modified the original CSS to reflect satisfaction with the use of telehealth technology. The CSS, in its original form, has been found to have a Cronbach's alpha

internal consistency reliability coefficient of .94 and a one-week test-retest reliability coefficient of .64 (Tracey & Dundon, p. 7). The scale has also shown evidence of various forms of validity. Strong face validity is evident, as the measure appears to conspicuously measure satisfaction (Schneider). The Follow Up Questionnaire on Individual Counseling (FUQIC) (Gelso & Johnson, 1983) has shown moderate concurrent and predictive validity with the measure ($r = .60$) (Tracey & Ray, 1984 as cited in Schneider, p. 56).

The revised version of the CSS that was used in the Schneider (2000) telehealth study was also examined for internal consistency and was found to have a Cronbach's alpha of .88 (p. 80). It is from this revised version that the CSS was modified to be more germane for the purposes of this study. For example, item number one on the CSS states, "I am not pleased with my overall improvement." This item was revised to "I am not pleased with the lectures" for the telehealth condition and "I am not pleased with the literature handouts" for the attention placebo condition. Another example is taken from item number seven, "I would recommend therapy that was delivered through two-way video to a friend," which was revised to "I would recommend health education that was delivered through two-way video to a friend," for the telehealth condition and "I would recommend health education that was delivered through printed material to a friend" for the attention placebo condition. Hereafter, the revised version of the CSS used in this study will be referred to as the Participant Satisfaction Scale (PSS).

Previous studies conducted to date on consumer satisfaction of telehealth also include provider satisfaction (Hilty et al., 2004; Pesamaa, 2004; see also Folen et al., 2005; Hailey, 2001). Provider satisfaction in this study was assessed by evaluating the

MHP who conducted the lecture. The MHP was asked to complete a revised version of the Therapist Satisfaction Scale (TSS) (Tracey & Dundon, 1988). A modified version of the TSS was also used in the Schneider (2000) psychotherapy telehealth study. The initial form of this measure has been found to have an internal consistency Cronbach's alpha coefficient of .80 (Kokotovic & Tracey, 1990, p. 18). Moreover, high face validity is evident within the TSS as well as concurrent and predictive validity; a moderate correlation of .55 has been shown with the Counseling Outcome Measure (COM) (Gelso & Johnson, 1983; Tracey & Ray, 1984 as cited in Schneider, p. 57).

Schneider's (2000) telehealth study found an internal consistency Cronbach's alpha coefficient of .84 for the modified TSS (p. 80). This modified version of the TSS was revised to expediently measure lecturer satisfaction (only within the telehealth condition). For instance, item number one on the TSS states, "I believe our work together was very successful." This item would be revised to state, "I believe the lecture was very successful." Item number three on the TSS states, "I felt very frustrated when working with this client." This item would be revised to, "I felt very frustrated working with the participants." The revised version of the TSS used in this study will be referred to as the Lecturer Satisfaction Scale (LSS).

Cost effectiveness analysis. Given the promulgation throughout the literature for information on the cost-effectiveness of telehealth (Glueckauf, & Ketterson, 2004; Hilty, Marks, Urness, Yellowlees, & Nesbitt, 2004; Hylar & Gangure, 2003; Jennet et al., 2003), an assessment of cost-effectiveness was incorporated into the study. Frueh et al. (2000) and Hailey (1999) recommend that a telehealth cost effectiveness analysis entail estimated travel savings from both patients and clinicians. In analyzing travel savings,

both transportation costs and time spent traveling should be included in the equation. Furthermore, the Frueh et al. and Hailey articles suggest accounting for telehealth expenses from a societal perspective. Societal costs of telehealth include the purchase of videoconferencing equipment and replacement of this equipment every three years, and bridging and line charges. To complete the cost analysis, all of the above telehealth costs are then juxtaposed with conventional care costs (patient visits the MHP).

In analyzing cost effectiveness, this study garnered data based on the above recommendations of Frueh et al. (2000) and Hailey (1999) by asking patients and the MHP to estimate cost savings and to state whether or not they would recommend telehealth as an effective cost saving way to receive or deliver health care at a distance. In a real world setting, the telehealth equipment will be housed in the individual's home. Due to the fact that the telehealth condition of this study takes place in a setting away from the participant's and the MHP's home, subjects were asked to base estimates of cost savings as if they were in a real world setting, viewing or conducting the lecture from their own home.

The principal investigator of this study was responsible for gathering recommended data on telehealth expenses from the societal perspective. All cost data gathered were then used to estimate total costs of telehealth at a workload of one consultation per week, for a total of fifty-two consultations; this information was then used as an estimate of conventional care costs where the patient travels to the doctor's office. Copies of each of the cost effectiveness analyses for the participants, lecturer, and societal aspects can be found in Appendix M.

Adherence to the psychoeducational lecture transcripts. The integrity of the psychoeducational lectures presented by the MHP and ASL interpreter were checked to determine how closely the psychoeducational transcripts were followed. This was assessed by using a modified version of the Therapy Adherence Scale that was used in the Schneider (2000) telehealth study. Psychometric data on the Therapy Adherence Scale could not be found in the literature.

The Therapy Adherence Scale is a category format scale which ranges from one, “I did not use this type of therapy,” to ten, “I used this type of therapy completely.” This scale was modified to reflect adherence to the psychoeducational lecture. Future references to this modified Therapy Adherence Scale will be referred to under the appellation of the Lecture Adherence Scale. Specifically, the scale used the same category format method with statements that range from, one, “I did not adhere to the transcript,” to ten, “I adhered to the transcript completely.” A copy of the Lecture Adherence Scale can be found in Appendix N. For the ASL interpreter, the statements range from, one, “I did not adhere to the lecture,” to ten, “I adhered to the lecture completely.” The adherence scale for the ASL interpreter will be referred to as the Interpreting Adherence Scale; a copy of this scale can be found in Appendix O.

Procedure

Participants who sent in their RSVP via email and expressed interest in participating in the study were given an assigned time (12 or 6 p.m.) to attend the SCCDHH in Taylorsville, Utah on the day of the experiment. Upon arrival at SCCDHH, participants were registered and sent to their assigned condition groups: the telehealth condition or the attention placebo control condition. Participants were given the

appropriate agenda schedule of the day's events that pertained to the condition group in which he or she was assigned: Schedule A if he or she started in the telehealth condition or schedule B if he or she started in the attention placebo control condition. A copy of the agenda schedules for the 12 o'clock session can be found in Appendix P. For those participants who did not RSVP via email and desired to participate in the study, random assignment was determined by assigning participants to each group on an alternating basis. A babysitting service at SCCDHH was offered for those participants with children.

Before initiation of the experiment, participants received an informed consent form that was signed and dated. Essential points of the informed consent form were explained to the participants; moreover, participants were briefed concerning the availability of two ASL interpreters to help with questions that he or she might have with the consent form, demographics sheet, or questionnaires. The ASL interpreters were not available to interpret the psychoeducational printed materials (see below). Subjects also filled out a demographics information sheet. A copy of the demographics information sheet used in the study can be found in Appendix Q.

Once all consent forms were signed, dated, and returned, and all demographic information sheets collected, subjects in both groups were administered a depression knowledge test to gather pretest scores, which was then followed by the BDI-II and BHS. Following pretest evaluation, the psychoeducational intervention for each group was initiated.

For the telehealth group, a MHP conducted the depression psychoeducational lecture. An ASL interpreter interpreted the lecture. The attention placebo control group

received the same information as the telehealth group; however, this information was presented in printed literature format.

A five to ten minute question and answer session followed the psychoeducational lecture within the telehealth condition. Following the question and answer session, both the telehealth and the attention placebo conditions were administered an alternate forms posttest of the depression knowledge test in order to attain posttest scores. While the participants were completing the posttest, the MHP and ASL interpreter filled out a Lecture/Interpreting Adherence Scale to determine concordance with the first psychoeducational lecture transcript.

Following completion of the knowledge posttest by the telehealth and attention placebo control groups, a satisfaction questionnaire was administered to both groups, including the MHP. The telehealth condition group also completed one additional measure- a cost effectiveness analysis. Following completion of these measures, these two groups switched conditions and repeated the previous sequence of activities with the exception of completing the BDI-II and BHS. That is, prior to beginning the second psychoeducational lecture (which expounded on the topic of depression), the original attention placebo control group moved from the attention placebo condition room to the telehealth condition room and prepared to undergo an interpreted psychoeducational lecture via the telehealth condition. The original telehealth group moved from the telehealth condition room to the attention placebo control condition room and read the printed material as part of the attention placebo control group. Prior to beginning the second psychoeducational lecture or intervention, a second pretest knowledge depression test was administered. At the conclusion of the second psychoeducational intervention,

both conditions received an alternate-forms posttest depression knowledge test to assess knowledge gained. The MHP and ASL interpreter were again asked to evaluate adherence to the second psychoeducational transcript with the Lecture/Interpreting Adherence Scale.

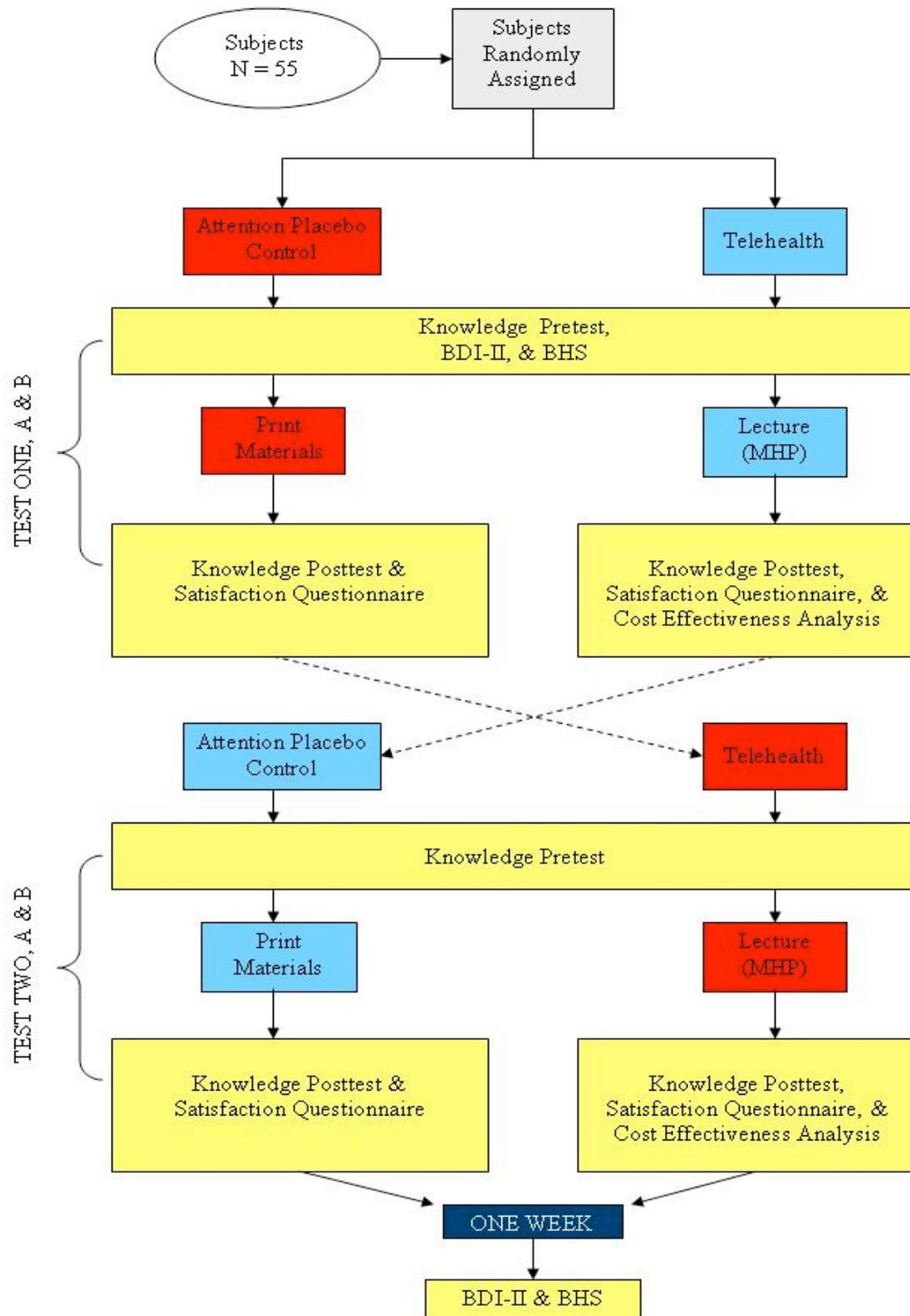
Upon completion of the depression knowledge posttest and the Lecture/Interpreting Adherence Scale, satisfaction questionnaires were administered. That is, the appropriate PSS was administered to the telehealth and attention placebo groups. The LSS was given to the MHP who conducted the lecture.

Finally, a cost effectiveness analysis was conducted. The cost effectiveness analysis, following the second psychoeducational lecture, was administered to the telehealth condition as well as the MHP. Participants from the telehealth and attention placebo conditions were then asked to return one week later to complete the second administration of the BDI-II and the BHS. Following completion of the BDI-II and BHS, participants were given a debriefing form. A copy of the debriefing form can be found in Appendix R.

A summary of research findings will be mailed to participants who expressed interest in obtaining this information. This interest was expressed by indicating in the appropriate space on the demographics sheet. Figure 6 summarizes the above described procedures of the study in a chart format.

Figure 6

Design Procedures



CHAPTER FOUR

RESULTS

Before presenting the results of this study, it is important to ensure that the dependent measures used are considered reliable and valid, especially within the study sample (Cone & Foster, 2001). Consequently, psychometric scrutiny was applied to the measures used with the deaf sample in this study. Specifically, the depression knowledge questionnaires, BDI-II, BHS, and the satisfaction questionnaires were analyzed to determine reliability and validity. These questionnaires were also compared to past findings concerning its psychometric properties. Due to the constructed response format of the cost effectiveness questionnaires, psychometric analyses were not applied to this measure.

Following the evaluation of the psychometric properties of the dependent measures used in the study, the research hypotheses and corresponding null hypotheses are listed. The statistical analysis results are then presented in the same sequential order in which the hypotheses are listed.

Validity and Reliability of Dependent Measures Used in the Study

Depression knowledge questionnaires. Item analyses of the first depression knowledge questionnaire that was administered to the deaf sample indicated the average item difficulty index to be .54. Mean internal consistency reliability as measured by Cronbach's alpha was reported at .795. A higher item difficulty index was found on the first depression knowledge posttest scores ($d_{\text{Telehealth}} = .69$; $d_{\text{Control}} = .635$; $d_{\text{Combined}} = .662$; $\alpha_{\text{Telehealth}} = .705$; $\alpha_{\text{Control}} = .835$; $\alpha_{\text{Combined}} = .77$). Overall, the standard error of measurement decreased from pretest to posttest ($SEM_{\text{pretest1}} = 1.997$; $SEM_{\text{posttest1}} = 1.87$).

The second depression knowledge questionnaire pretest demonstrated an average item difficulty index of .52. Mean Cronbach's alpha was reported at .807. Following the same pattern as the first depression knowledge pretest and posttest, the second depression knowledge posttest demonstrated an easier average item difficulty index ($d_{\text{Telehealth}} = .595$; $d_{\text{Control}} = .675$; $d_{\text{Combined}} = .635$; $\alpha_{\text{Telehealth}} = .85$; $\alpha_{\text{Control}} = .885$; $\alpha_{\text{Combined}} = .867$). Overall, the standard error of measurement decreased from pretest to posttest ($SEM_{\text{pretest2}} = 2.10$; $SEM_{\text{posttest2}} = 1.95$). Table 6 compares the psychometric properties obtained from the validation sample with the coefficients obtained in the deaf research sample on the depression knowledge questionnaires.

Table 6

Psychometric Properties of Depression Knowledge Questionnaires

Test	N	<i>d</i>	α	SEM
Original Validation Sample				
Pretest I	17	.70	.08	1.89
Posttest I		.96	.45	.88
Pretest II		.79	.57	1.75
Posttest II		.93	-.86	1.20
Deaf Research Sample				
Pretest I	55	.54	.795	1.997
Posttest I		.662	.77	1.87
Pretest II		.52	.807	2.10
Posttest II		.635	.867	1.95

Note. Combined values are reported for the deaf research sample (i.e. values are not separated to distinguish the telehealth from the control group).

BDI-II and BHS. The BDI-II attained a strong Cronbach's alpha internal consistency reliability coefficient for the deaf sample in this study ($\alpha = .93$). However, a moderate level Cronbach's alpha was attained for the BHS in this study sample ($\alpha = .32$). Table 7 below juxtaposes the BDI-II and BHS internal consistency with those attained in past studies.

Table 7

Reliability Comparisons of the Current Study BDI-II and BHS to Previous Studies

Study	N	α
BDI-II (Current Study)	49	.93
BDI-II (Leigh & Anthony-Tolbert, 2001; deaf sample)	63	.88
BHS (Current Study)	54	.32
BHS (Beck & Steer, 1988; non-deaf sample)	Unknown	.87

Note. Only the first administration of both the BDI-II and BHS were included in the internal consistency reliability analysis for the current study.

PSS and LSS. The PSS and LSS questionnaires were also analyzed for internal consistency reliability using Cronbach's alpha. Due to the variation in the items between the PSS that the telehealth and control groups took, internal consistency analyses were applied to each group separately. The PSS for the telehealth condition attained a Cronbach's alpha coefficient of .76. The control condition attained an alpha coefficient of .80. The LSS had an alpha coefficient of .16. Table 8 compares the PSS and LSS to internal consistency reliability coefficients attained in previous studies.

Table 8

PSS and LSS Reliability Comparisons to Previous Studies

Study	N	α
PSS- Telehealth (Current Study)	52	.76
PSS- Control (Current Study)	50	.80
Modified CSS (Schneider, 2000; non-deaf sample)	Unknown	.88
LSS (Current Study)	4	.16
Modified TSS (Schneider, 2000; non-deaf sample)	Unknown	.84

The small Cronbach's alpha coefficient obtain with the LSS should be interpreted with caution due to the small sample size ($N = 4$).

Lecture adherence scale. Cronbach's alpha could not be conducted on the lecture adherence scale due to an insufficient number of cases to conduct an analysis. Instead, descriptive statistics from the results will be presented. On a scale of one to ten (one: complete nonadherence to the transcript; ten: complete adherence to the transcript) the MHP who conducted the lecture indicated a 9 across all four lectures conducted. The ASL interpreter, using this same scale format (one: complete nonadherence to the lecture; ten: complete adherence to the transcript) had a mean of 8 (SD = .816; Range = 7-9) across the four lectures. These results indicate that the lectures conducted via telehealth were valid in its presentation and interpretation.

Putting it all together: Criterion referenced validation. In addition to the above analyses, a criterion-referenced validation task was conducted with the total scores from the dependent measures mentioned above. The lecture adherence scale was omitted from

the criterion referenced task due to lack of reliability statistics. Table 9 illustrates the correlations amongst the measures.

Table 9

*Matrix of Correlations amongst Dependent Measures***Correlations**

		Beck Depression Inventory-II	Beck Hopelessn ess Scale	Satisfaction Literature	Satisfaction Telehealth	Satisfaction Lecturer	Depression Knowledge Pretest Mean Score (ALL)	Depression Knowledge Posttest Mean Score (ALL)
Beck Depression Inventory-II	Pearson Correlation	1	.548**	-.189	.151	.091	-.193	-.229
	Sig. (2-tailed)	.	.000	.215	.318	.909	.183	.113
	N	49	48	45	46	4	49	49
Beck Hopelessness Scale	Pearson Correlation	.548**	1	-.177	.116	.870	-.245	-.199
	Sig. (2-tailed)	.000	.	.223	.419	.130	.075	.149
	N	48	54	49	51	4	54	54
Satisfaction Literature	Pearson Correlation	-.189	-.177	1	-.082	.879	.266	.389**
	Sig. (2-tailed)	.215	.223	.	.582	.121	.062	.005
	N	45	49	50	47	4	50	50
Satisfaction Telehealth	Pearson Correlation	.151	.116	-.082	1	-.040	-.062	-.017
	Sig. (2-tailed)	.318	.419	.582	.	.960	.660	.905
	N	46	51	47	52	4	52	52
Satisfaction Lecturer	Pearson Correlation	.091	.870	.879	-.040	1	1.000**	.411
	Sig. (2-tailed)	.909	.130	.121	.960	.	.	.589
	N	4	4	4	4	4	4	4
Depression Knowledge Pretest Mean Score (ALL)	Pearson Correlation	-.193	-.245	.266	-.062	1.000**	1	.755**
	Sig. (2-tailed)	.183	.075	.062	.660	.	.	.000
	N	49	54	50	52	4	55	55
Depression Knowledge Posttest Mean Score (ALL)	Pearson Correlation	-.229	-.199	.389**	-.017	.411	.755**	1
	Sig. (2-tailed)	.113	.149	.005	.905	.589	.000	.
	N	49	54	50	52	4	55	55

** . Correlation is significant at the 0.01 level (2-tailed).

Note. Depression knowledge pretest and posttest correlations based on the mean of all administrations of the tests.

As stated previously, prior studies have shown hopelessness to be associated with depression. The BDI-II and BHS in this study indicated that the constructs of depression and hopelessness are related ($r = .548$), thus constituting evidence for convergent validity. Moreover, evidence for convergent validity was demonstrated between the depression knowledge pretest and posttest ($r = .755$).

Correlations between the satisfaction scales with the other scales should be interpreted with caution due to the low reliability coefficients and/or small sample size (i.e., LSS had an N of 4). Since symptoms of depression or hopelessness should not theoretically be an indicator of depression knowledge, the correlations amongst the depression knowledge scales and the BDI-II and BHS appear to be indicative of discriminant validity.

Statement of Hypotheses

The general questions or goals that this study sought to answer were outlined at the beginning of chapter three. These questions will now be revisited with one difference- the questions will be restated in a hypothesis format. In essence, it is from these questions that the research hypotheses are formulated. In addition to the research hypotheses, it is important to create corresponding null hypotheses (Howell, 2002). All hypotheses were tested using nondirectional or two-tailed analyses. The analyses and results of the study will be discussed in the order in which the research and null hypotheses are presented below.

Research hypotheses. The following research hypotheses were established before initiation of any stage of the research experiment:

- 1) The telehealth condition will demonstrate posttest knowledge depression scores that are significantly different from the attention placebo control condition.
- 2) There will be a significant difference between the telehealth and attention placebo conditions with participant satisfaction.
- 3) The telehealth condition and the MHP will demonstrate equal levels of satisfaction in the use of the telehealth technology.
- 4) Telehealth will be considered to be a cost-effective option for delivering health care when compared to a hypothetical in-person condition.
- 5) No significant differences will be found on the BDI-II and BHS at one-week posttest.

Null hypotheses. Corresponding to the above stated research hypotheses, the following null hypotheses are established:

- 1) The telehealth condition does not differ from the attention placebo control group condition on posttest knowledge depression scores.
- 2) The telehealth and attention placebo control condition do not differ in terms of participant satisfaction.
- 3) There is no difference between the telehealth condition and the MHP with satisfaction in the use of the telehealth technology.
- 4) The telehealth condition does not differ from a hypothetical in-person condition in the area of cost effectiveness.
- 5) The BDI-II and BHS retest scores do not differ at one-week posttest.

As an added emphasis, although the above hypotheses appear to be stated in a directional format, all statistical analyses were conducted using nondirectional or two-tailed tests.

The analyses and results of the study are now presented.

Study Results

Effectiveness of Telehealth to Disseminate Psychoeducational Objectives

A two-way within subjects analysis of variance was conducted to evaluate the effectiveness of using telehealth to disseminate psychoeducational objectives within the deaf population compared to an attention placebo control condition. The dependent variable was a knowledge test score with a possible score ranging from 0 to 25. The within-subjects factors were the condition with two levels (telehealth and attention placebo control) and test with two levels (pretest and posttest).

The Test, Condition, and Condition x Test interaction effects were tested using the multivariate criterion of Wilks' lambda (Λ). The Test main effect was significant, Wilks' $\Lambda = .504$, $F(1, 54) = 53.204$, $p = .000$. However, the Condition main effect was nonsignificant, Wilks' $\Lambda = 1.000$, $F(1, 54) = .007$, $p = .934$. Moreover, the Condition x Test interaction effect was nonsignificant, Wilks' $\Lambda = .984$, $F(1, 54) = .850$, $p = .361$. The results of this analysis are summarized in Table 10 below.

Table 10

Two-Way Repeated Measures Analysis of Variance for Test, Condition, and Condition x

Test

Source	df	F	Λ	<i>p</i>
Test	1, 54	53.204	.504	.000***
Condition	1, 54	.007	1.000	.934
Condition x Test	1, 54	.850	.984	.361

Note. *** $p < .01$; probability values based on two-tailed tests.

As an exploratory exercise, the nonsignificant Condition x Test interaction effect was analyzed using two paired samples *t* tests. Specifically, the pretest telehealth condition was compared to the pretest control condition and the posttest telehealth condition was compared to the posttest control condition. Familywise error rate was controlled across these tests using Holm's sequential Bonferroni approach. Differences in mean ratings between the two conditions were not significantly different for the pretest, ($M_{\text{PreTelehealth}} = 13.27$, $SD = 4.92$; $M_{\text{PreControl}} = 13.07$, $SD = 4.53$), $t(54) = -.399$, $p = .692$. The final follow up exploratory comparison evaluated the mean difference between the two conditions for the posttest, ($M_{\text{PostTelehealth}} = 15.47$, $SD = 5.14$; $M_{\text{PostControl}} = 15.76$, $SD = 5.55$), $t(54) = .418$, $p = .677$, which is not less than a significance value of .05 and, therefore, not significant. The above analysis is summarized in Table 11 below.

Table 11

Paired-Samples T Tests for Condition x Test Interaction

Condition	Mean	SD	df	T	p
Pretest Telehealth	13.27	4.92			
Pretest Control	13.07	4.53	54	-.399	.692
Posttest Telehealth	15.47	5.14			
Posttest Control	15.76	5.55	54	.418	.677

Note. ** $p < .05$; probability values based on two-tailed tests.

The results indicate that participants in both pretest condition groups were approximately equal in mean scores. Moreover, the results fail to reject the first null hypothesis – the telehealth condition does not differ from the attention placebo control group condition on posttest knowledge depression scores. A summary statement of the various hypothesis results can be found in Table 19 at the end of the results section.

In addition to the above analyses, paired-samples t tests were run for each of the eight experimental conditions. The results are displayed in Table 12 below. Effect size measures are computed for each condition using eta square (η^2).

Table 12

Paired-Samples T Tests for each Experimental Condition

Condition	N	Mean	SD	<i>p</i>	η^2
Group One					
Pretest 1 Control 12 p.m.	13	13.85	5.54		
Posttest 1 Control 12 p.m.	13	18.62	5.47	.002***	.571
Pretest 2 Telehealth 12 p.m.	13	13.38	4.79		
Posttest 2 Telehealth 12 p.m.	13	15.54	5.09	.019**	.697
Group Two					
Pretest 1 Telehealth 12 p.m.	11	13.82	5.36		
Posttest 1 Telehealth 12 p.m.	11	15.91	4.85	.070*	.291
Pretest 2 Control 12 p.m.	11	12.73	4.78		
Posttest 2 Control 12 p.m.	11	16.64	6.14	.001***	.697
Group Three					
Pretest 1 Control 6 p.m.	23	12.78	3.84		
Posttest 1 Control 6 p.m.	23	13.30	4.48	.307	.047
Pretest 2 Telehealth 6 p.m.	23	12.78	5.24		
Posttest 2 Telehealth 6 p.m.	23	14.17	5.68	.013**	.247
Group Four					
Pretest 1 Telehealth 6 p.m.	8	13.75	4.33		
Posttest 1 Telehealth 6 p.m.	8	18.50	2.88	.000***	.851

(Table Continues)

Table 12 (continued)

Pretest 2 Control 6 p.m.	8	13.13	5.06		
Posttest 2 Control 6 p.m.	8	17.00	5.66	.001***	.817

Note. Maximum score = 25. * $p < .10$. ** $p < .05$. *** $p < .01$; probability values based on two-tailed tests.

Figure 7 in Appendix S contains boxplots for each of the experimental conditions.

Taking the above analysis one step further, a comparison was made between the two conditions that had the highest η^2 effect size measures. Specifically, a paired samples t test was run to compare the pretest and posttest 1 telehealth group at 6 p.m. ($\eta^2 = .851$) with the pretest and posttest 2 control group, also at 6 p.m. ($\eta^2 = .817$). No significant differences were found for the pretest conditions $t(7) = -.517, p = .621$. Moreover, no significant differences were found for the posttest conditions $t(7) = -1.158, p = .285$.

In order to attain separate effect size values for the overall telehealth and control conditions, a two-way within-subjects analysis of variance was conducted with the data taken as an aggregate. The results for these analyses can be found in Table 13.

Table 13

Two-Way Analysis of Variance for Overall Telehealth and Control Conditions

N	F	<i>p</i>	η^2
Pre and Post Telehealth			
55	32.029	.000***	.372
Pre and Post Control			
55	33.616	.000***	.384

Note. *** $p < .01$; probability values based on two-tailed tests.

As can be seen in the table above, the control condition demonstrated a slightly higher effect size at .384, compared to overall telehealth condition $\eta^2 = .372$. As indicated previously, the paired samples *t* test indicated no significant differences between the two conditions for the pretest ($t [54] = -.399, p = .692$) or posttest ($t [54] = .418, p = .677$).

Satisfaction Analyses Between Telehealth and Control Conditions

In analyzing and comparing participant satisfaction between the telehealth and attention placebo control conditions, an independent-samples *t* test was implemented. Before presenting the results, it should be mentioned that there were several missing PSS scores in both conditions. One PSS score was dropped from the telehealth group due to agreement bias. Some participants simply left the PSS blank or did not turn in their forms.

The results for the independent-samples *t* test demonstrated no significant difference between the two conditions, $t (100) = 1.453, p = .149$. This outcome fails to reject the null hypothesis that the telehealth and attention placebo control condition do not differ in terms of participant satisfaction. The results of this analysis are summarized

in Table 14 below. The maximum score possible on the PSS is 49, with high scores indicating high levels of satisfaction. Figure 8 shows the distributions between the two conditions.

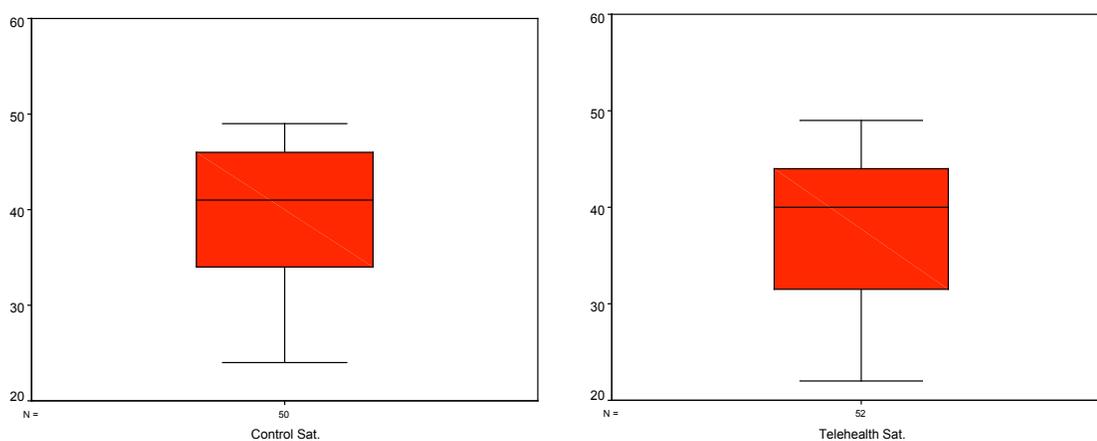
Table 14

Independent-Samples T Tests for Satisfaction Analyses

Condition	N	Mean	SD	T	<i>p</i>
Telehealth	52	37.98	7.57		
Control	50	40.04	6.69	1.453	.149

Note. Maximum score = 49. Probability values based on two-tailed tests.

Figure 8. *Boxplot distributions comparing satisfaction between the control and telehealth groups.*



Independent-samples *t* tests were also run for each of the four groups (telehealth at 12 p.m. & 6 p.m. and control at 12 p.m. & 6 p.m.) in order to assess whether there were any differences amongst a specific group. The results indicated that there were no significant differences between any of the conditions in the four groups. The results for each analysis are summarized in Table 15 below.

Table 15

Independent-Samples T Tests for Satisfaction Scores Amongst Each Group

Condition	N	Mean	SD	T	<i>p</i>
Group One					
Control 12 p.m. *(L1)	12	40.83	7.83	.798	.433
Telehealth 12 p.m. **(L2)	13	38.08	9.30		
Group Two					
Telehealth 12 p.m. (L1)	10	39.78	5.31	.411	.686
Control 12 p.m. (L2)	9	40.80	5.49		
Group Three					
Control 6 p.m. (L1)	22	38.91	7.02	.628	.533
Telehealth 6 p.m. (L2)	22	37.50	7.83		
Group Four					
Telehealth 6 p.m. (L1)	8	37.13	6.92	1.209	.250
Control 6 p.m. (L2)	6	41.33	5.71		

Note. Maximum score = 49. Probability values based on two-tailed tests. *L1 denotes Lecture #1 was used as the intervention under the specified condition; **L2 denotes Lecture #2 was used as the intervention under the specified condition.

Satisfaction Analyses between the Telehealth Group and the MHP

In addition to participant satisfaction, lecturer satisfaction was assessed. The MHP who conducted the lecture filled out the LSS following each of the four lectures given. The LSS has a maximum score of 56, with high scores indicating high levels of satisfaction. Moderate to high levels of satisfaction were indicated across all four

administrations of the LSS ($M_{\text{LecturerSatisfaction}} = 46.50$, $SD = 1.92$). The results for each of the four lectures are summarized in Table 16 below.

Table 16

Summary Statistics for Lecturer Satisfaction

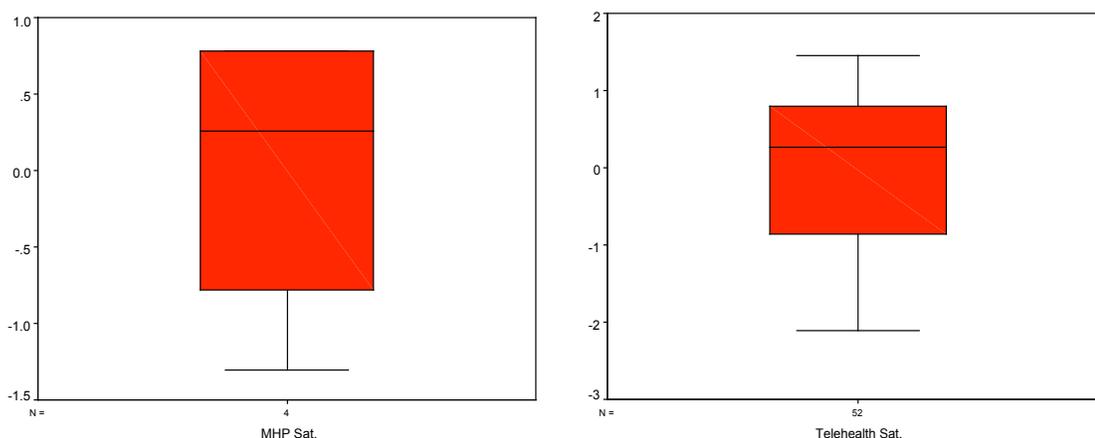
Condition	Sum Total	Mean	SD
Lecture 1 Telehealth 12 p.m.	48		
Lecture 2 Telehealth 12 p.m.	48		
Lecture 1 Telehealth 6 p.m.	46		
Lecture 2 Telehealth 6 p.m.	44	46.50	1.92

Note. Maximum score = 56.

A Mann-Whitney U two independent samples test was conducted to evaluate the hypothesis that the telehealth condition and the MHP would demonstrate equal levels of satisfaction in the use of the telehealth technology. Before running the analysis, all satisfaction sum total scores were converted to Z scores. Due to the fact that the LSS has a higher maximum score than the PSS, converting to Z score units allows for comparisons to be made in the same metric. The results of the test indicated no significant differences between the two groups, $Z = -.032$, $p = .975$. As expected, the telehealth condition and the MHP demonstrated equal levels of satisfaction in the use of the telehealth technology. The average rank for the MHP was 28.25, while the telehealth group had an average rank of 28.52.

Figure 9 shows the Z score distributions on the LSS for the MHP and on the PSS for the study participants.

Figure 9. *Z-score boxplot distributions comparing the satisfaction of the MHP with study participants in the use of telehealth technology.*



As an added statistical perspective and to corroborate the above statistical analysis, an independent-samples t test was conducted to evaluate the hypothesis that the telehealth condition and the MHP would demonstrate equal levels of satisfaction in the use of the telehealth technology. Before running the analysis, the total scores on the LSS were converted to match the 49-point scale of the PSS. Again, there was no significant difference $t(54) = 2.014, p = .06$. The mean score for the telehealth condition PSS was 37.98 (SD = 7.57), while the MHP LSS was 40.69 (SD = 1.68).

It should be noted that both the Mann-Whitney U test and the independent samples t test results given above should be interpreted with caution. These results should be interpreted with caution due to the fact that there were only four satisfaction analyses filled out under the MHP condition. These four MHP satisfaction analyses were then compared to the fifty-two satisfaction analyses completed by the participants in the telehealth condition group. Such comparisons may make it difficult to accurately compare the two conditions. Due to the nature of the comparison, both the Mann-

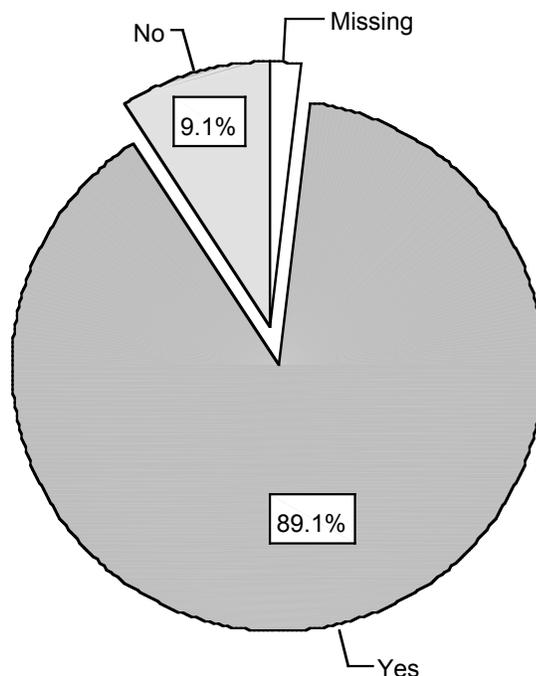
Whitney U test and the independent samples t test analyses were run on the above data in order to substantiate the conclusions from each test.

Cost Effectiveness of Telehealth

Descriptive statistics were used to analyze the qualitative and quantitative aspects of telehealth's cost effectiveness. The qualitative results will first be presented which will be followed by the quantitative facets.

The main qualitative aspect of the telehealth cost effectiveness analysis is related to the following selected response question which was presented to the participants, "Would you recommend two-way video to a friend as a way to save money in seeking health care? Circle one: YES NO." A total of 54 study participants responded to this question with 49 individuals (89.1%) indicating a "Yes," while 5 individuals (9.1%) chose "No." One study participant did not answer the above question. Figure 10 summarizes the percentages of study participants' answers to the above question.

Figure 10. *Percentage of participants indicating whether or not telehealth is considered to be a cost-effective means of healthcare delivery.*



The MHP who conducted the lecture was given a similar question phrased as, “Would you recommend two-way video as an effective cost saving way to deliver health care at a distance? Circle one: YES NO.” The MHP chose “Yes” as the response.

Quantitative facets of telehealth cost effectiveness included estimating transportation costs savings as well as amount of travel time saved if the participants or MHP did not have to travel to the telehealth site, but instead, used the telehealth technology from home. The results indicated a mean of \$23.25 in transportation savings for study participants ($N = 43$). The MHP estimated travel cost savings to be \$13.00. The mean estimated travel time saved for participants was one hour and three minutes. For the MHP, travel time saved was estimated at two hours. These estimated costs savings of telehealth were used to calculate total cost savings of telehealth at a workload

of one consultation per week, for a total of fifty-two consultations in one year. The results of this analysis can be found in Table 17 below.

Table 17

Cost Savings of Telehealth Per Year

Type of Cost Savings	Mean Savings
Transportation Savings (Participants)	\$1,208.81
Travel Time Saved (Participants)	55 hours
Transportation Savings (MHP)	\$676.00
Travel Time Saved (MHP)	104 hours

Note. Mean cost savings estimates based off a workload of one consultation per week, for a total of fifty-two consultations per year.

In addition to telehealth cost effectiveness estimated from the participant and MHP perspectives, societal aspects of cost effectiveness was analyzed. Costs for the telehealth equipment were estimated at \$75.00. Costs for replacing this technology every three years were estimated at \$56.00 (or \$18.67 a year). Bridging and line charges were estimated at \$50 per month for a total of \$600.00 a year. Based on the above stated societal costs, total telehealth-related costs sum to approximately \$693.67 a year. A summary table of all pecuniary cost comparisons is given below in Table 18.

Table 18

Monetary Cost Savings and Expenses of Telehealth

Type of Cost	Mean Savings
Transportation Savings (Participants)	\$1,208.81
Transportation Savings (MHP)	\$676.00
Transportation Savings (Participants and MHP combined)	\$1884.81
Societal Costs	\$693.67
Total Savings/Expenses of Telehealth	+ \$1191.14

Note. Mean transportation savings estimates based off a workload of one consultation per week, for a total of fifty-two consultations per year. Societal costs examines total mean telehealth related costs for both a start-up and maintenance year.

BDI-II and BHS One-Week Retest Analyses

The final analysis entailed examining BDI-II and BHS retest scores using a one-way repeated measures ANOVA. The within subjects factor is time with two levels with the dependent variable being either the BDI-II or BHS scores. The results for the repeated measures ANOVA conducted on the BDI-II indicated a significant time effect, Wilks' $\Lambda = .829$, $F(1, 46) = 9.51$, $p = .003$. The effect size was measured with a multivariate test associated with Wilks' lambda and yielded a multivariate eta square (η^2) of .171.

The same analysis conducted on the BHS yielded a nonsignificant time effect, Wilks' $\Lambda = .952$, $F(1, 50) = 2.51$, $p = .120$, multivariate $\eta^2 = .048$. The means and

standard deviations for both the BDI-II and BHS, both at the first administration and at one-week retest are presented in Table 19 below.

Table 19

Means and Standard Deviations for BDI-II and BHS Scores

Test Point in Time	N	Mean	SD
BDI-II			
First Administration:	47	13.70	11.89
One Week Retest:		10.23	11.59
BHS			
First Administration:	51	4.04	3.74
One Week Retest:		3.39	3.34

Note. Means and Standard Deviations based on the actual sample included in the analysis.

In addition to the above table, boxplots were created to show the distributions of the BDI-II and BHS scores at both administration time periods. The boxplots are displayed in Figures 11 and 12 below.

Figure 11. *Boxplot distributions of BDI-II time one and one-week retest.*

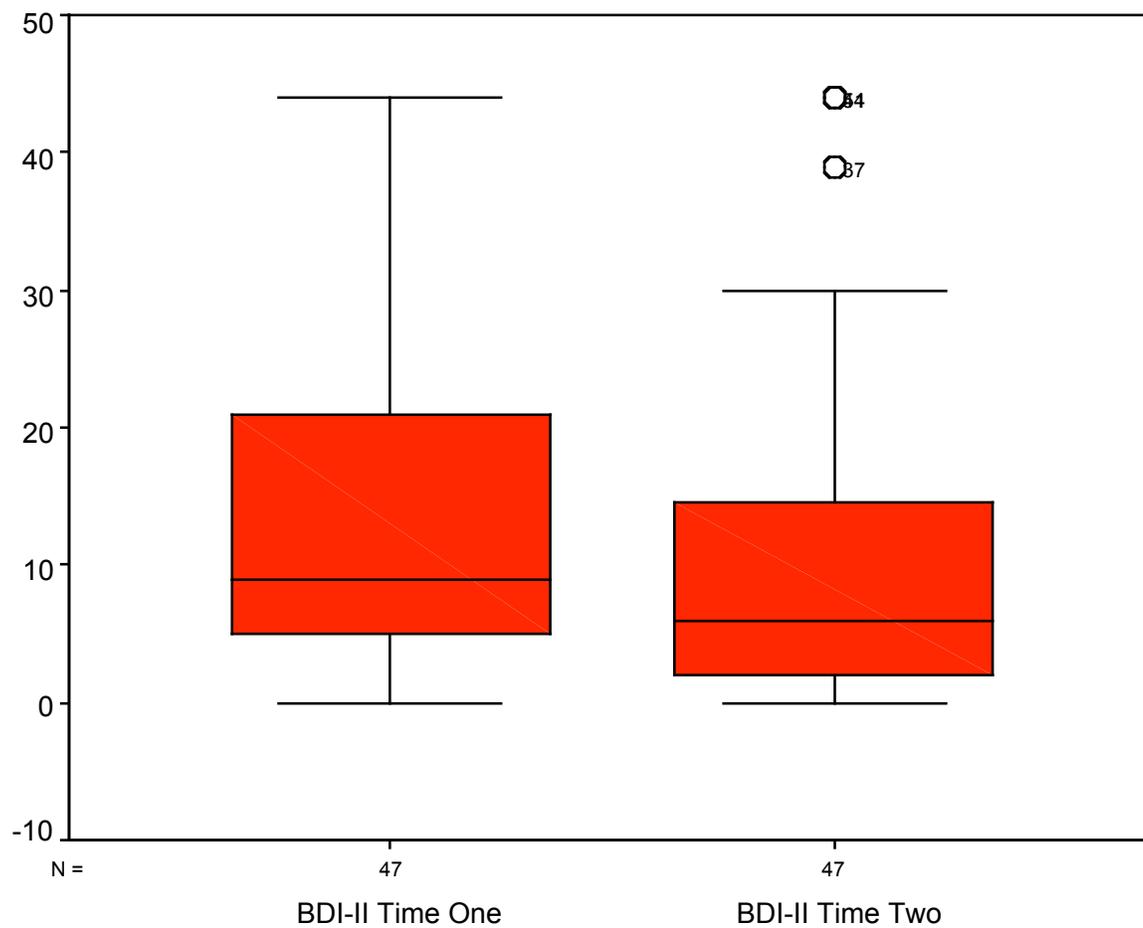
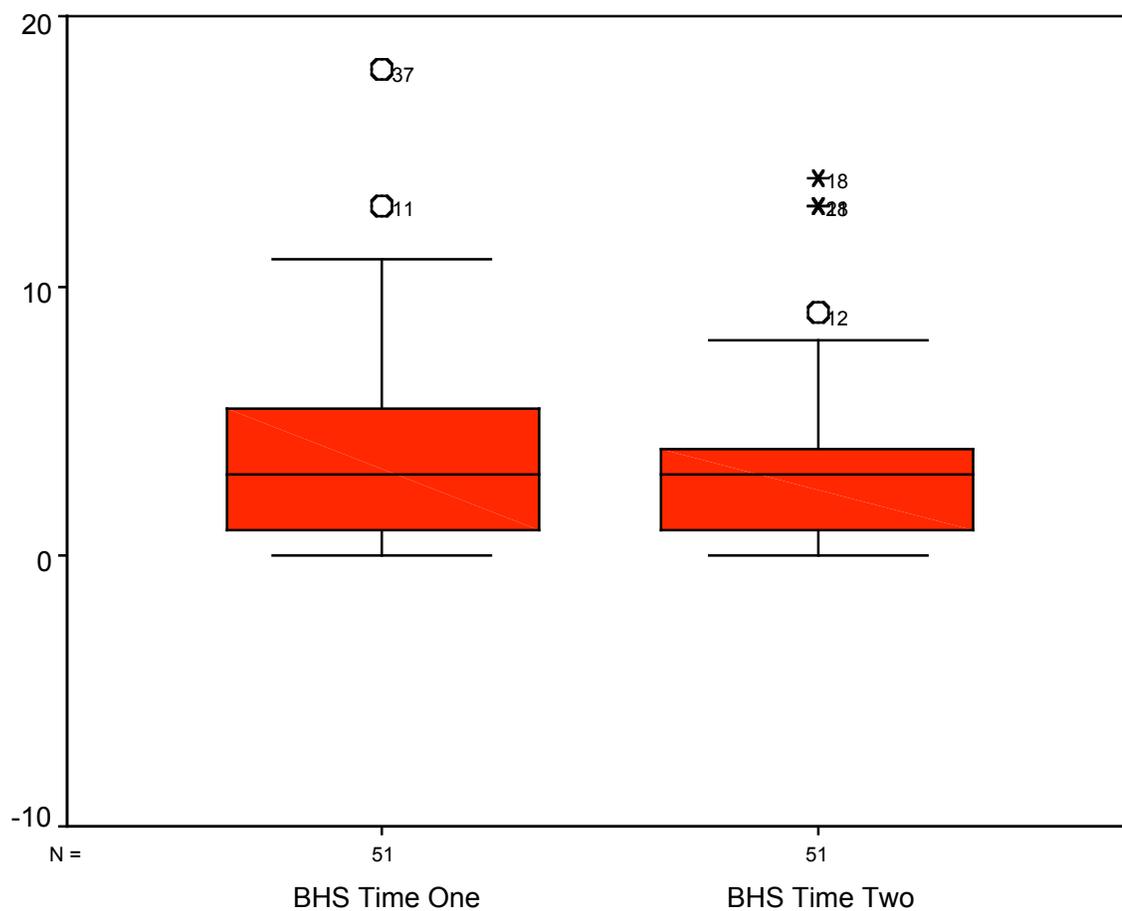


Figure 12. *Boxplot distributions of BHS time one and one-week retest.*



Conclusion of Results Section

In concluding the results section of this study, the research hypotheses set up in this study are juxtaposed with the outcome of the null hypotheses. This side-by-side comparison is presented in Table 20 below.

Table 20

<i>Results of Hypotheses</i>	
Statement of Research Hypothesis:	Outcome of Null Hypothesis:
<p>1) The telehealth condition will demonstrate posttest knowledge depression scores that are significantly different from the attention placebo control condition.</p> <p>2) There will be a significant difference between the telehealth and attention placebo conditions with participant satisfaction.</p> <p>3) The telehealth condition and the MHP will demonstrate equal levels of satisfaction in the use of the telehealth technology.</p>	<p>1) Results fail to reject the null hypothesis- the telehealth condition does not differ from the control condition on posttest knowledge depression scores.</p> <p>2) Results fail to reject the null hypothesis- the telehealth and control condition do not differ in terms of participant satisfaction.</p> <p>3) Fail to reject the null- there is no difference between the telehealth condition and the MHP with satisfaction in the use of the telehealth technology. Research hypothesis supported.</p>

(Table Continues)

Table 20 (continued)	
<p>4) Telehealth will be considered to be a cost-effective option for delivering health care when compared to a hypothetical in-person condition.</p> <p>5) No significant differences will be found on the BDI-II and BHS at one-week posttest.</p>	<p>4) Research hypothesis supported- telehealth is considered to be a cost effective option for healthcare services. Null hypothesis that there is no difference when compared to a hypothetical in-person condition is rejected.</p> <p>5) Partial rejection of the null- the BDI-II scores differed at one-week retest; the BHS scores did not.</p>

CHAPTER FIVE

DISCUSSION

Before embarking on a discussion of the results and implications of this study, it is important to mention that there were some technical difficulties associated with the videoconferencing equipment on the day of the experiment. The image projected to the Deaf Center from the BYU campus would repeatedly freeze up during the psychoeducational lectures, creating significant communication gaps. Computer technicians from the BYU campus as well as the Deaf Center stated that the technical difficulties were probably due to high traffic conditions and demands on the network at the time the experiment was run. The technicians also stated that it was not unusual for the network to be busy on Saturdays, the day the experiment was run. High demands on the network may also occur on other days of the week and at variable times. It can be said that such unpredictable network conditions created a natural experimental environment. The unfavorable conditions experienced on the day of the experiment might be considered a test of telehealth's effectiveness in such conditions.

The focus will now shift to summarizing and interpreting the research findings of this study. The findings of this study will be discussed in the order that the research hypotheses were established: 1) Effectiveness of telehealth to disseminate psychoeducational objectives; 2) Satisfaction analyses between telehealth and control groups; 3) Satisfaction analyses between the telehealth group and the MHP; 4) Cost effectiveness of telehealth; and 5) BDI-II and BHS one week retest analyses. Next, the limitations of this study will be discussed. Finally, suggestions for future research will be highlighted.

Effectiveness of Telehealth to Disseminate Psychoeducational Objectives

The first research hypothesis stated that the telehealth condition would demonstrate posttest knowledge depression score gains that were significantly different from the attention placebo control condition. In assessing such comparisons, the results indicated no significant differences on posttest scores between the two conditions. Instead, both conditions were considered to be equally efficacious in meeting the goal of psychoeducational dissemination. As stated above, one reason why the telehealth condition may not have demonstrated posttest knowledge depression scores that were significantly different from the attention placebo control condition could have been due to the technical difficulties with the videoconferencing equipment on the day of the experiment. Because the videoconferencing transmission from the BYU campus to the Deaf Center would continually freeze up- creating significant communication gaps- it was difficult to understand the sign language interpreter and comprehend the lecture. Consider the following comment that was used in the lecture, “Hopefully, this lecture will help you to better understand that clinical depression and other disorders of a psychological nature are considered to be illnesses, not weaknesses, and that such disorders usually respond very well to treatment.” An example of the communication gap resulting from a freeze in the transmission frame resulted in the prior comment being conveyed as, “Hopefully, this lecture will help you to better understand that clinical depression . . . (freeze) . . . illnesses . . . (freeze) . . . well to treatment.” Such freezes in the transmission frame took place at various points and with various frequencies across all four telehealth psychoeducational lectures that were conducted.

It is interesting to note that regardless of the technical difficulties, the telehealth condition demonstrated significant pretest to posttest score gains across all four individual psychoeducational lectures when the p value was set at .10 or less. Three out of the four psychoeducational lectures were significant with p values at .05 or less. The effect sizes – as measured by eta square – for each of the telehealth lectures ranged from .247 to .851. For the purposes of this study, such outputs are considered to be in the small to large effect size range (Cohen, 1992, pp. 156-157). The large variation in effect size measures is probably due to the frequency of the videoconferencing transmission frame freezing up; in other words, some groups may have experienced less technical difficulties than others. Taken as an aggregate, the telehealth condition demonstrated significant pretest to posttest gain scores with a p value at less than .01 and an effect size of .372. In essence, the results demonstrate that telehealth is considered an effective and viable means of health care delivery to the deaf population – despite the presence of technical difficulties.

Comparing the telehealth results to the attention placebo control found three of the four individual control groups attained significant pretest to posttest score gains, even with the p level set at its ceiling value of .10. The effect size values ranged from .047 to .817, again, a categorical range of small to large effect sizes. It is of interest to note that the telehealth condition demonstrated the largest effect size when comparing the individual groups (maximum telehealth $\eta^2 = .851, p = .000^{***}$; maximum control $\eta^2 = .817, p = .001^{***}$). However, when comparing the overall effect size, the control condition demonstrated a slightly higher eta square effect size at .384 ($p = .000^{***}$), in comparison to the overall telehealth eta square effect size of .372 ($p = .000^{***}$). These

overall results indicate that the lecture transcripts were also considered to be beneficial in disseminating psychoeducational objectives – at least for this particular deaf sample.

Of the four different experimental groups, the 6 o'clock group that started in the attention placebo control condition had the largest sample size ($N = 23$). It was this group that did not attain significant pretest to posttest score gains in the control condition, $p = .307$, $\eta^2 = .047$. However, significant gains were found in the telehealth condition, $p = .013^{**}$, $\eta^2 = .247$.

If the telehealth condition can still exhibit significant gains within the deaf population in depression knowledge posttest scores despite problems with the network, it would be interesting to see the kinds of gains that could be made if the picture transmission was clear and problem free. Perhaps then, the telehealth condition would show significant knowledge depression posttest score gains over and above the attention placebo control condition. As videoconferencing equipment continues to advance, the future promises to bring better and more reliable technology. However, this study has demonstrated that telehealth is effective in disseminating psychoeducational objectives to the deaf population, regardless of technical problems.

Satisfaction Analyses Between Telehealth and Control Groups

The second research hypothesis stated that there would be a significant difference between the telehealth and attention placebo conditions with participant satisfaction. The results indicated no significant difference between the two conditions, leading to a failure to reject the null hypothesis. Instead, moderate to high levels of satisfaction were found for both conditions, with the mean satisfaction score for the telehealth condition being slightly lower than the mean satisfaction score for the control condition ($M_{\text{Telehealth}} =$

37.98, $SD = 7.57$; $M_{\text{Control}} = 40.04$, $SD = 6.69$). The PSS had a maximum possible satisfaction scale score of 49.

The telehealth condition may have demonstrated a lower satisfaction mean score than the control condition because of the technical difficulties inherent with the videoconferencing technology on the day of the experiment. One participant wrote a comment in the margins of the PSS that he or she would seek help that was delivered through two-way video “if the technology works [correctly].” Another participant stated that “it’s [sic] hard to see what the interpreter was saying.” Yet another subject indicated a 1 on the Likert scale (Very Strongly Disagree) for the item, “I would seek help that was delivered through two-way video,” and then added the following comment, “slow speed-bad picture.”

The control condition may have indicated high scores on the PSS for several reasons. Perhaps those participants who participated first in the telehealth condition before moving into the control condition were disillusioned by the videoconferencing technical problems and found relief in having full and unobstructed access to the information via the lecture transcripts. Moreover, high scores on the PSS for the control condition may be the result of the educational characteristics of the particular deaf sample involved in the study. On the demographics sheet, 37 out of the 55 individuals (67%) in the deaf sample indicated having at least some college experience.

One might wonder whether or not there were any differences amongst a specific group that participated in either the telehealth or attention placebo control condition at either the 12 o’clock p.m. or 6 p.m. time slot. The results indicated that there were no significant differences between any of the two conditions in the four groups. The

attention placebo control group had a higher satisfaction score for each group comparison with a satisfaction score range of +1.02 to 4.2. Consequently, satisfaction does not appear to be correlated with whether or not a specific group performed better on the posttest under a specific condition.

Satisfaction Analyses Between the Telehealth Group and the MHP

The third research hypothesis stated that the telehealth condition and the MHP would demonstrate equal levels of satisfaction in the use of the telehealth technology. The research hypothesis was supported – there was no difference between the telehealth condition and the MHP. The average LSS indicated a moderate to high level of satisfaction on the part of the MHP in the use of the technology to conduct the lectures ($M_{\text{LecturerSatisfaction}} = 46.50$, $SD = 1.92$; maximum score = 56).

It is of interest to note that for item #4 on the LSS (“If given the option, I would provide health services through two-way video again.”), the MHP indicated a 6 on a Likert scale ranging from 1 (“Very Strongly Disagree”) to 7 (“Very Strongly Agree”) for the first two telehealth lectures conducted. For the final two lectures, the MHP indicated a 5 for this question. Moreover, for item #8 (“I would recommend using two-way video to deliver health services across distance.”), the MHP indicated a 7 for the first two lectures and a 5 for the final two lectures. Such decreases in satisfaction ratings for these two items over time may have been due to the frustration in the technical difficulties experienced with the videoconferencing technology. Technicians from both sites dedicated a lot of time and attention into alleviating the technical difficulties before and in between each telehealth lecture, with little to no success. As stated previously, the

technicians pointed to high traffic demands on the network as the culprit for the technical difficulties experienced that day.

Another noteworthy item on the LSS was item #7 (“I could communicate well with the participants.”). On this item, the MHP indicated a 5 for the first three lectures and a 4 for the final lecture. In addition to the technical problems that may have created the communication difficulties, the fact that the lectures were conducted through the aid of a sign language interpreter could have contributed to the communication barriers as perceived by the MHP.

Cost Effectiveness of Telehealth

The penultimate research hypothesis stated that telehealth would be considered to be a cost-effective option for delivering health care when compared to a hypothetical in-person condition. The results indicate that telehealth is, indeed, considered to be a cost-effective option for delivering health care; consequently, the null hypothesis is rejected. The majority of the study participants (89.1%) indicated that they would recommend telehealth as a way to save money in seeking health care. The MHP who conducted the lecture also agreed in the same manner.

Participants were asked to estimate total travel cost savings if he or she had viewed the lecture from home through the telehealth technology. This allowed for comparisons to be made with conventional care costs in which the individual transports himself or herself to the doctor for consultations. The face-to-face consultation in this case was the site in which the study participants and MHP had to travel to in order to participate in the study. Such a comparison of the cost effectiveness of telehealth to a hypothetical in-person consultation based on travel time and transportation costs yielded

significant financial gains. Transportation costs alone yielded average savings of \$1,208.81 over a one-year period for study participants. Over this same period, an average of 55 hours that would have been devoted to traveling to the consultation site was saved by having access to health care at home via videoconferencing. For the MHP, yearly transportation cost savings were estimated at \$676. Estimated travel time savings for the MHP was 104 hours – nearly double that of the participants’ average.

Estimates of costs savings from the societal perspective was also included in the cost effectiveness analysis. Specifically, costs for the telehealth equipment and replacement of the technology every three years were estimated. Costs for telehealth equipment have decreased exponentially over the years as telehealth technology has improved (Maheu, 1999; Turner, 2003). These decreases in costs have made the telehealth technology more accessible to health care providers. For the purposes of this study, societal costs for purchasing equipment were based on the average costs of a Sorenson Videophone (which is usually given to qualified deaf individuals free of charge) and a Polycom PVX 8.0.1 machine. This yielded an average cost of \$75 in order to purchase the proper equipment needed to conduct telehealth consultations. It should be noted that this cost only includes the videoconferencing camera and software; it does not include the TV or computer monitor that would be needed for picture transmission. Given the trend for improvements in the technology along with decreased costs, estimates of replacing the videoconferencing equipment every three years was based on the supposition that costs would decrease by twenty-five percent of the costs today. These decreases in costs would total to approximately \$56 to replace the technology every three years. In addition to equipment costs, bridging and line charges were incorporated into

the cost analysis. Bridging and line charges were estimated at \$50 (Harvey, 2006) a month for a total of \$600.00 per year.

Combining the mean transportation savings of the participants and the MHP at a workload of one consultation per week for a total of fifty-two consultations yields a savings total of \$1884.81 a year. The total combined mean expenses of telehealth from a societal perspective is approximately \$693.67. Juxtaposing the savings and expenses indicated above yields a total savings of \$1191.14 a year for both, the patient and clinician. Such cost effectiveness data indicates that the savings significantly outweigh the costs in the use of telehealth.

In essence, this study shows that telehealth is indeed cost effective when compared to traditional face-to-face health care encounters. It is also becoming much more financially viable given the advent of better and cheaper technology. From the results of this study, it can be said that health care providers stand to save both time and money when using telehealth technology as a means of providing health care.

BDI-II and BHS One-Week Retest Analyses

The final research hypothesis stated that no significant differences would be found on the BDI-II and BHS at one-week posttest. The results indicated a partial rejection of the null hypothesis – significant differences were found at one-week retest for the BDI-II. However, no significant differences were found for the BHS, although there was a drop in the mean score at retest.

It should be noted that there were eight study participants that could not be included in the BDI-II analysis. These missing scores were due to various reasons such as not completing the BDI-II in its entirety (some subjects failed to complete the other

side of the form), simply desiring not to volunteer such information, and subject attrition at the one-week retest. The BHS analysis sample had four missing scores due to some of the same reasons stated previously.

Based on the clinical interpretation of BDI-II scores which is accomplished through criterion-referenced procedures, the following interpretive ranges were utilized: 0-13 – minimal depression; 14-19 – mild depression; 20-28 – moderate depression; and 29-63 – severe depression (Beck et al., 1996). The mean drop in BDI-II scores for this study was from a descriptive category of mild depression ($M_{\text{FirstAdministration}} = 13.70$, $SD = 11.89$) to minimal depression ($M_{\text{OneWeekRetest}} = 10.23$, $SD = 11.59$). The BHS scores are also interpreted using criterion-referenced procedures and utilize the following descriptive categories: 0-3 – normal; 4-8 – mild; 9-14 – moderate; and over 14 – severe ((Beck et al., 1974). Although no significant differences were found with the BHS retest scores, it is of interest to note that the mean BHS scores dropped from the descriptive category of mild ($M_{\text{FirstAdministration}} = 4.04$, $SD = 3.74$) to normal ($M_{\text{OneWeekRetest}} = 3.39$, $SD = 3.34$).

The significant and nonsignificant drop in the BDI-II and BHS scores, respectively, may perhaps be due to the psychoeducational intervention. Some studies have shown that a single consultation alone can account for significant therapeutic gains. For example, single session interventions using the Motivational Interviewing technique have been shown to be effective in triggering significant change relative to no treatment or placement on a waiting list (Miller & Moyers, 2005). Perhaps learning about possible treatment options for depression was enough to give participants a sense of hope or of having some tools with which to deal with depressive symptoms.

Limitations of Study

In most studies, there are inherent limitations within the design and investigation. This study is no exception to such limitations. Following is a discussion concerning these constraints to generalizations that can be deduced from this study.

In seeking a controlled comparison study between telehealth and an attention placebo control condition to assess the feasibility and effectiveness of telehealth technology within the deaf population, a sample size of fifty-five deaf individuals was recruited. Given that subject attrition is a natural occurrence in many studies, it was expected that some subjects would not show at one-week retest or fill out all measures administered. Although there was a total of fifty-five subjects recruited, the smallest sample of participants completing any dependent measure was forty-seven (BDI-II). While such sample sizes may be considered small for statistical analyses – due to the nature of the “special population” being assessed, this sample size is deemed adequate for the purposes of this study. However, it is important to recognize that this low statistical power may increase the likelihood of making a Type II error – concluding that there are no differences between groups, when a difference in fact exists (Kazdin, 2003).

There is also the possibility of a novelty effect taking place, especially within the telehealth condition. Individuals who have never been exposed to the telehealth technology may rate the exposure in a positive manner based on the innovativeness or uniqueness of the approach. However, while the novelty effects of this situation cannot be entirely ruled out, the usage of Video Relay Service (VRS) amongst the deaf population may help to diminish these effects. VRS implements the use of a monitor and camera (videophone) that allows a deaf caller and relay operator to view each other while

the deaf individual places a phone call. The relay operator voice interprets the deaf person's signs to the hearing person being called (see Fitzgerald, 2003). The videophone can also be used to directly call another individual who uses sign language. The usage of this technology is becoming widespread in the deaf community.

As can be seen based on the set up of the fifth research hypothesis (no significant differences will be found on the BDI-II and BHS at one week posttest), it seemed that the one time exposure to the psychoeducational lecture on depression would preclude any possible therapeutic benefits or effects as detected by the BDI-II and BHS. Moreover, psychoeducational lectures, per se, are not generally considered a bona fide therapeutic intervention. Any remediation in depression based on the BDI-II retest scores was expected to be minimal at best. A partial rejection of the null hypothesis resulted: There was a significant drop in the BDI-II and a non-significant drop in the BHS scores. One reason for the drop in scores may be attributed to the phenomenon of regression to the mean. Based on this principle, retest scores can on average become better or worse, depending on whether the subject scored below or above average on a specified test. In essence, changes in scores towards the mean could have been partly due to a statistical artifact (Hopkins, 2002).

The generalizability of this study may have been threatened by the fact that the ASL interpreter had ample time to prepare for the psychoeducational lecture given in the telehealth condition because the interpreter had access to the transcripts ahead of time. Although some interpreters are given sufficient time and opportunities to prepare themselves to interpret a specific topic, this may not always be the case. Spontaneous

interpreting can make it much more difficult to convey a message accurately, with the same spirit and content as intended by the speaker.

Due to the fact that some dependent measures were administered to and collected from subjects prior to the psychoeducational lectures, such measures may have created a pretest sensitization effect, causing subjects to be affected differently by the lecture. Subjects may have become more or less amenable or responsive to the lecture intervention merely because of the pretest assessment. Attempts were made to control pretest sensitization with respect to the telehealth condition by also having the attention placebo control condition take a pretest measure. Another dependent measure difficultly could relate to the fact that because subjects and providers had to travel to their respective sites, the cost-effectiveness measure incorporated into this study may not generalize to real world settings. In a real world setting, the telehealth unit would be housed in the person's home or located in a nearby health clinic in a rural area. The costs of travel and time would then appear to be much less significant in this type of setting. Efforts to control this factor and, consequently, generalize to a real-world setting, was made by asking subjects to estimate travel cost savings if the videoconferencing sites were located in their own home.

In concluding this section on the limitations inherent within this study, it needs to be mentioned that the wide variation in English skills amid the deaf population created the possibility of collecting unreliable data. Given that standardization data with some of the instruments used in this study was not viable, an unreliable measure, per se, could have called into question the validity of the results collected. Attempts were made to verify the psychometric soundness of the instruments used in this study. All measures

used appeared to demonstrate acceptable levels of reliability and validity coefficients. It should also be noted that 37 out of the 55 individuals (67%) in the deaf sample indicated having at least some college experience. Such unique sample characteristics may have been a factor in the significant gains demonstrated in the attention placebo control condition that was given the psychoeducational transcripts. Based on the fact that the national average reading level for the deaf population is a 4th grade level (Marschark, 1993; Moores, 2001 as cited in Leigh & Anthony-Tolbert, 2001; see also Steinberg et al., 1998; Holt, 1994), it may be possible that such significant depression knowledge score gains may not have been demonstrated had a sample that approached the national deaf norms been used.

Conclusion and Recommendations

The use of telehealth appears to hold promise as a means of alleviating the dearth of appropriate mental health care access within the deaf population. There are currently no experimental studies in the literature that explore the feasibility of using telehealth to alleviate the barriers to health care within the deaf population. This study provides evidence for the efficacy and effectiveness of telehealth to disseminate psychoeducational objectives within this population. The majority of the users of the technology indicated satisfaction with the medium, despite the technical difficulties experienced within the study. Moreover, this study corroborates the small existing research that points to the cost effectiveness of telehealth when compared to traditional modes of healthcare delivery. Considering the use of telehealth technology as a means of alleviating some of the barriers that deaf individuals may face in gaining access to health care may be a

suitable alternative in many situations. The implications for clinical practice, theory, and research within the realm of telehealth usage with the deaf population are multifold.

One of the interesting results found in this study is the fact that telehealth was demonstrated to be effective in disseminating psychoeducational objectives to the deaf population regardless of occasional technical difficulties in the picture transmission. Moreover, the study participants and MHP indicated moderate to high levels of satisfaction despite the technical problems. It would be exciting to see what kinds of results would be obtained if the study was conducted under problem-free network conditions. Perhaps an even larger effect size would have been demonstrated than what was found in this study.

Should the study procedures as outlined in this study be replicated, it may be beneficial to use a different type of control or comparison condition than what was used in the current study. For example, the telehealth condition could be compared to a no-treatment or wait-list control condition in which the group is assessed pretest-posttest, but receives no type of intervention in between assessments. The intervention could then be given following administration of the depression knowledge measures. Another idea would be to compare a MHP interpreted lecture telehealth condition with that of a signing MHP who conducts the lecture via telehealth without the aid of an interpreter.

A logical next step for research might be to examine the effectiveness of telehealth in conducting other areas of healthcare delivery to the deaf population such as diagnostic assessments or actual treatment where outcomes could be assessed. Such studies might implement a comparison to an in-person condition and/or wait-list control condition. Comparison to a control condition utilizing self-help literature would also be

interesting. Given the appropriate resources and time, it would be advantageous to include samples of the deaf population over a wider geographical expanse.

In essence, it can be said that this study accomplished its intended goal, which was to demonstrate that telehealth is an effective and viable means of healthcare delivery to the deaf population. The future of telehealth is an exciting one. Advances in the technology can only bring about more reliable videoconferencing capabilities along with clearer and better picture quality. Indeed the possibilities of using telehealth as a means of alleviating the current healthcare shortage within the deaf population are endless.

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APPENDIX A

Results of Power Analysis

Table 1

Results of Power Analysis for this Study's Design

N	Delta (in units of sigma)				
	0.250	0.500	0.750	1.000	1.250
2	0.058	0.085	0.131	0.195	0.275
3	0.067	0.119	0.209	0.332	0.477
4	0.074	0.151	0.281	0.452	0.632
5	0.082	0.183	0.350	0.556	0.746
6	0.089	0.214	0.416	0.644	0.829
7	0.097	0.245	0.478	0.718	0.887
8	0.104	0.276	0.535	0.779	0.926
9	0.112	0.307	0.587	0.828	0.953
10	0.120	0.337	0.636	0.867	0.970
12	0.135	0.395	0.719	0.923	0.988
14	0.150	0.450	0.786	0.956	0.995
16	0.166	0.503	0.839	0.975	0.998
18	0.181	0.552	0.880	0.986	0.999
20	0.197	0.597	0.911	0.992	0.999
25	0.235	0.696	0.960	0.998	0.999
30	0.274	0.775	0.982	0.999	0.999

(Table Continues)

Table 1 (continued)

35	0.311	0.835	0.992	0.999	0.999
40	0.349	0.881	0.997	0.999	0.999
50	0.420	0.940	0.999	0.999	1.000

Note. Within subjects factors: condition with two levels (telehealth and attention placebo control)

and depression knowledge scores with two levels (pretest and posttest). $H_a: T_1 = GM - \Delta/2,$

$T_2 = T_3 = \dots = T_{(k-1)} = GM, T_k = GM + \Delta/2$ tested at $\text{Alpha} = 0.050.$

APPENDIX B

Posting for Subject Recruitment

Want to help with
research?
**Be Involved with a Health
Study!**

You must be Deaf/Hard-of-Hearing and
fluent in sign to participate.

Jaime Wilson will reward you with **\$20!**

Email Jaime Wilson's research manager at:
SherryAlbrethsen@aol.com

Where:

**Robert G. Sanderson Community Center of the Deaf and
Hard of Hearing**

5709 South 1500 West

Taylorsville, Utah 84123

When:



**Saturday,
June 3rd**

**Refreshments will
be provided!!! (Yum)**

Choose when you can come:

12 noon OR 6 P.M.

APPENDIX C

Informed Consent Form

Consent to be a Research Subject

Introduction

This research study is being conducted by Jaime A.B. Wilson and Dr. Gawain Wells, Ph.D. at Brigham Young University to determine alternative solutions to health care accessibility within the deaf population. You were selected for participation in this study because a) you have an identifiable hearing loss, and b) you are fluent in American Sign Language (ASL).

Procedures

Following collection of demographic data, you will be asked to view and read two different presentations concerning depression. Questionnaires will be administered before and after the presentations in order to assess your knowledge as well as your present state of health with regards to depression. Both presentations will take place on the same day. After completion of each presentation, you will be asked to fill out a questionnaire that will assess your satisfaction with the presentation. The presentations will take approximately twenty minutes while each questionnaire will take approximately fifteen minutes to complete. Your participation on this day will take approximately 180 minutes. You will receive \$20 following completion of all stages of the study on this day.

You will be asked to return one week later in order to fill out two final questionnaires concerning depression. These questionnaires will take around ten minutes to complete.

Risk/Discomforts

There are minimal risks for participation in this study. You may feel emotional discomfort when answering questions about your personal health. All researchers will be sensitive to those who may become uncomfortable. Depending on the nature of the discomfort or concern - either expressed or observed - appropriate action will be taken; moreover, you may contact a member of the research team at any given time during the research study to discuss any or all concerns.

Benefits

There are a number of benefits for participation in this study. Some of these benefits include but are not limited to, increased awareness concerning one's health, knowledge concerning specific interventions to receive help, and exploration of alternative solutions to health care accessibility. A summary of research findings will be mailed to participants who express interest in obtaining this information by indicating in the appropriate area at the bottom of the demographics form.

Confidentiality

All research information gleaned in the study will remain strictly confidential and will be reported as group data with no identifying information. All questionnaires will be kept in a secure location and will be accessible only to those directly involved with the research. After all research information is analyzed and completed, the questionnaires will be destroyed.

Participation

Participation in this research study is voluntary. You have the right to withdraw from the research at anytime or to refuse to participate entirely without risk.

Questions about the Research

Should any questions arise regarding this study, you may contact Jaime A.B. Wilson at peanutbutterface@tmail.com, 801-656-0780, 168 TLRB or Dr. Gawain Wells, Ph.D. at gawain_wells@byu.edu, 801-422-6125, 1082 SWKT.

Questions about your Rights as Research Participants

If you have questions you do not feel comfortable asking the researcher(s), you may contact Dr. Renea Beckstrand, Ph.D. IRB Chair, renea_beckstrand@byu.edu, 801-422-3873, 422 SWKT.

I have read, understood, and received a copy of the above consent and desire of my own volition to participate in this study.

Signature: _____

Date: _____

Witness: _____

Date: _____

APPENDIX D

RA Comments to Participants Transcript

*Below is an **example** of directions that should be given to deaf participants by the research assistant in charge of administering and collecting consent forms, demographic sheets, and all questionnaires. Please be as brief in your comments as feasible to keep the study length to the shortest time possible.*

Welcome all Participants

Hello everyone! It's good to see all of you here today. Thank you for joining the health study. My name is _____ and I am helping with the study today. Before we get started with the research, I need to have you fill out a consent form. Please read this consent form and sign below. The consent form is mainly to make sure you understand the essential features of the research study being conducted today.

Let me just quickly summarize the main points of the consent form. You qualify to participate in the study today because you have a hearing loss and are fluent in sign language. After completion of the study today, you will receive \$20. The study today will take approximately three hours. We will then ask you to return next week Saturday between 12 noon and 9 p.m. to fill out two questionnaires that will take ten minutes. You will receive an additional \$10 if you come back next week to complete the last two questionnaires. That's a total of \$30- plenty of money for a hot date at a nice restaurant. ☺

It is important for you to know that there are two ASL interpreters in the room to sign any items on the consent form or questionnaires that you might not understand. Just raise your hand and the interpreter will be happy to sign the items for you.

PASS OUT CONSENT FORM

Please read the form and sign in the appropriate area. You may ask the person sitting next to you to sign as your witness. Bring the form to me when you are done.

Now I have another sheet I need you to fill out. This form is a demographic sheet to collect some information about you. Please remember that all identifying information or names will be kept strictly confidential. Please fill this out and pass it back to me when you are done.

PASS OUT DEMOGRAPHICS FORM (RESEARCH PARTICIPANT INFORMATION QUESTIONNAIRE)

Now we can start with the real questionnaires! ☺

→ I am going to give you a pretest now. Please remember that there are two ASL interpreters in the room to sign an item you might not understand; all you need to do is raise your hand and the interpreter will come and help. Because we want to keep the study as short as possible, the ASL interpreter will only sign the item for you **once**. Please do your best and let me know if you have any questions. When you are done, give me the test and I will give you another questionnaire.

PASS OUT DEPRESSION KNOWLEDGE PRETEST I. WHEN A PARTICIPANT HANDS YOU A COMPLETED PRETEST, GIVE HIM OR HER THE BDI-II AND BHS AND TELL THEM TO HAND IT BACK TO YOU WHEN FINISHED.

ONCE EVERYONE HAS COMPLETED THE PRETEST I, BDI-II, AND BHS:

We are now going to view/read a presentation about depression. Please pay careful attention to the presentation. If you do not pay attention to the presentation, your \$20 will be donated to the person who has been paying attention! 😊 (say this part with humor). When the presentation is completed, you will take another test to see how much you have learned. [**Attention placebo group only:** The ASL interpreters will not be available at this time to interpret the printed literature presentations. When you finish reading the literature, bring it up to me and I will give you the other test. The ASL interpreters will, then, be available to interpret test items again.]

ADMINISTER THE PRESENTATION (TELEHEALTH GROUP: TURN ON TV AND TURN OFF LIGHTS; ATTENTION PLACEBO GROUP: ADMINISTER PRINTED LITERATURE).

ATTENTION PLACEBO GROUP ONLY: PASS OUT POSTTEST I WHEN SUBJECTS HAND IN PRINTED LITERATURE.

TELEHEALTH GROUP ONLY: WHEN THE PRESENTATION IS COMPLETED, TURN ON LIGHTS AND STATE: Here is the test. Remember, the interpreters are available to help with test questions you might not understand. Please give me the test when you are done. **PASS OUT POSTTEST I.**

BOTH GROUPS: AFTER SUBJECTS HAND IN POSTEST I, GIVE THEM THE PARTICIPANT SATISFACTION QUESTIONNAIRE AND TELL HIM OR HER TO HAND IT BACK TO YOU WHEN QUESTIONNAIRE IS COMPLETED. [Telehealth group only: GIVE PARTICIPANTS THE COST EFFECTIVENESS ANALYSIS WITH THE SATISFACTION QUESTIONNAIRE.]

Again, remember, the ASL interpreters are here to assist you with understanding items on the questionnaires.

WHEN THE LAST SATISFACTION QUESTIONNAIRE HAS BEEN HANDED IN, STATE:

We have just finished the first half of the study. We are now waiting for someone to let us know when we can move into a different room to complete the second half of the study. Please follow me into the next room for the second half of the study. If you get lost, there are posters on the wall to help you find the way to the next room.

WHEN NOTIFIED, LEAD PARTICIPANTS TO THE APPROPRIATE ROOM (LECTURE HALL IF IN CONFERENCE ROOM AND VICE VERSA).

REPEAT ABOVE STARTING AT THE ARROW ON THE BOTTOM OF PAGE ONE; HOWEVER, THIS TIME YOU WILL BE ADMINISTERING PRETEST II AND POSTTEST II. **DO NOT ADMINISTER THE BDI-II AND BHS THIS TIME.**

AFTER THE LAST SATISFACTION QUESTIONNAIRE (AND COST EFFECTIVENESS ANALYSIS FOR THE TELEHEALTH GROUP), PLEASE STATE:

Thank you all for your time today. Please remember to come back next week Saturday between 12 o'clock noon and 9 o'clock p.m. to fill out another questionnaire for \$10. Are there any questions about anything?

We will now wait for someone to come and let us know when we can leave. You will be paid the \$20 we promised you as you walk out of the room. Thank you!!!

APPENDIX E

Psychoeducational Lecture One Transcript

The following 15 to 20 minute lecture should be delivered by a mental health professional who has experience with diagnosing or treating depression.

Introduction: Goal of Depression Lecture

This depression lecture is designed to provide information to the deaf population about the signs, symptoms and treatment of depression. It gives deaf individuals, family members and friends the opportunity to find out if they or someone close to them may be suffering from a depressive disorder. The lecture is not intended to provide a diagnosis, but rather to identify common symptoms. From this lecture, you will be better educated in determining whether you or a loved one might benefit from a thorough medical or psychological evaluation and possible treatment.

Hopefully, this lecture will help you to better understand that clinical depression and other disorders of a psychological nature are considered to be illnesses, not weaknesses, and that such disorders usually respond very well to treatment.

Depression

What is Depression and How is it Different from the Blues?

Clinical depression is a very common disorder of mood that can be serious; it is pervasive, intense, and is evidenced by mental and physical symptoms. Depression can result in serious disturbances of work, social, and bodily functioning. Unlike ordinary sadness, the “blues,” or even grief suffered from the loss of a loved one, major or clinical depression usually does not respond to a change in circumstances, good news or the passing of time. While a fun activity- such as ordering pizza and watching a movie with

a loved one- may serve to alleviate sadness, clinical depression will not respond to such pleasurable activities. Depression can last for months or even years if left untreated, and can result in the disruption of relationships, professional productivity, disability, or death. Depression is a whole body illness involving physical symptoms, moods, and thoughts. It affects the way you eat and sleep, the way you feel about yourself, and the way you think about things. It can even appear as persistent, yet unexplained, aches, pains, or digestive problems. A depressive disorder is not a passing blue mood. It is not a sign of personal weakness or a condition that can be willed or wished away. People with a depressive illness cannot merely “pull themselves together” and get better. Without treatment, symptoms can last for months or years. It is important for a person who is depressed – and his or her family, friends and co-workers – to understand that depression is a disease. A depressed person has not caused these feelings and would have difficulty simply deciding to “snap out of it” and stop being depressed.

The great majority of people with clinical depression can be treated successfully with medication, psychotherapy, or the combination thereof. Antidepressant medicines and psychotherapy have been shown to influence brain chemistry, and within several weeks can yield important and sustained relief from depressive symptoms. Research shows that combining antidepressants with psychotherapy yields better outcomes than taking only an antidepressant or receiving only psychotherapy treatment alone, especially for severe depression.

Who Suffers from Depression?

Depression does not discriminate; it affects men and women, young and old, and people of all races, religions, cultures, and incomes. According to the National Institute of

Mental Health, depression affects around 20.9 million Americans each year. Higher prevalence rates of depression exist within the deaf population compared to the general population. One estimate indicated that only a mere 2% of deaf persons in need of mental health services actually received them. Moreover, one researcher found that mental health care was the most requested but least available service mentioned in a survey of community centers for deaf people.

Risk Factors

Some people are at greater risk of experiencing a depressive episode than others. Major risk factors for depression are: a) having had previous depressive episodes; b) a family/personal history of a mood disorder or excessive use of alcohol; c) being a woman, especially with a newborn baby; and d) those suffering from chronic pain.

The sooner depression is diagnosed and treated, the better. Left untreated, a mild episode of depression can progress into a major depression; a few bothersome symptoms can grow into a disabling condition. A person can overcome an episode of depression without any help, but it generally takes much longer – up to 1.5 years – and the risk of a return episode is greater.

What Causes Depression?

Chemical and nerve cell disturbances within the brain, sometimes genetically inherited, may play an important role in depression. Other factors can include stressful life events, another medical illness, drinking too much alcohol or abusing drugs. There are several factors that can be responsible for the onset of depression:

Biochemistry. Deficiencies of two chemicals in the brain, serotonin and norepinephrine, are thought to be responsible for certain symptoms of depression,

including anxiety, irritability, and fatigue. Biochemical changes in the brain, family history, personality and the stresses of life are all significant in the development of depression. Exactly how these causes interact is not known. Depression may be more likely for some people than for others, but no one is immune. Depression is an illness that can happen to anyone at any time in life.

Genetics. Depression can run in families. For example, if one identical twin has depression, the other twin has a 70% chance of also having the illness sometime in life. People who have a strong family history of depression are more likely to become depressed. It is also important to recognize that some people who suffer from depression may have no family history of it.

Personality. Personality type also plays a role in the development of depression. People who are very pessimistic, have low self-esteem, and get easily stressed out by their problems are more likely to become depressed. Depressed people have a tendency to have a distinctly negative view of themselves and the world around them. Due to this pessimistic outlook on life, these types of individuals may evaluate events as stressful that a nondepressed individual would not.

Environmental factors. Often, depression may be triggered by a stressful event, such as the death of a loved one, failure in school or financial problems. Continuous exposure to violence, neglect, abuse, or poverty may make people who are already susceptible to depression all the more vulnerable to the illness.

Are There Different Types of Depression?

Depressive disorders can come in different forms, just as is the case with heart disease. Some of the most common types of depressive disorders are:

Major Depressive Disorder. Major Depressive Disorder is considered to be the most common type of depression. This type of depression is characterized by a combination of symptoms that interfere with the ability to work, study, sleep, eat, and enjoy once pleasurable activities. The severity of symptoms and functional impairment can vary in individual cases of Major Depressive Disorder. The signs and symptoms of Major Depressive Disorder are:

- Depressed mood
- Diminished interest or pleasure in activities
- Significant change in appetite or weight
- Sleep disturbances
- Restlessness or sluggishness
- Fatigue or loss of energy
- Unexplained aches or pains
- Lack of concentration or indecision
- Feelings of worthlessness; inappropriate guilt
- Thoughts of death or suicide

Dysthymia. The second most common type, Dysthymia, is a milder form of depression with symptoms lasting two years or more. Due to its duration, Dysthymia can cause serious impairment with daily life activities. Because people with Dysthymia may have only two or three of the symptoms associated with Major Depressive Disorder, the seriousness of the diagnosis is often overlooked, and treatment is often not pursued.

Adjustment Disorder. Some people react to a very stressful event - loss of a job, breakup of a marriage, accident or major illness - with symptoms of depression that pass

within a few months and do not return. This condition, called an Adjustment Disorder with depressed mood, may not require treatment. However, if the symptoms do not pass, you may have a more serious disorder (such as Major Depression) that requires treatment. An Adjustment Disorder itself may require treatment if the symptoms are severe or interfere with daily functioning.

Seasonal Affective Disorder. This disorder is a type of mood fluctuation that follows a seasonal rhythm, with symptoms commonly occurring in the winter months (typically a time of depression) and diminishing in the spring and summer (typically a time of normal or even slightly elevated mood). Current research indicates that Seasonal Affective Disorder (SAD) may be caused by decreased sunlight as the days shorten and may lead to the typical symptoms of seasonal depression, including loss of energy, decreased activity, slowed thinking, sadness, and often excessive eating and sleeping. The great majority of those who suffer from SAD are women, but men are not immune, and SAD can also occur in children.

It is important not to confuse SAD with the “holiday blues,” which many experience as the result of increased stress during holiday seasons. The most common treatment for SAD is exposure to intense light for a period of time each day. Antidepressant medication and psychotherapy are also effective.

Co-occurring depression. People who suffer from a medical illness such as cancer, heart disease, diabetes, chronic pain or stroke, also may suffer from depression. In such cases, health professionals say that depression is co-occurring or “comorbid” with the other illness. Unfortunately, when depression occurs along with other illnesses, it often goes unrecognized, undiagnosed, and therefore, untreated.

Comorbid depression is treated like other types of depression, but requires particular attention to the possibility of interactions between medicines used to treat depression and those being taken for medical illnesses. Treatment can improve both the depression and the primary medical condition, thus increasing the quality of life and level of functioning. In fact, treating co-occurring depression can encourage people to be more compliant with the medical treatment for their primary illness, and may decrease complications and improve outcomes. Treating depression also makes people with a co-occurring illness less irritable and preoccupied with their other illness, and enhances positive thinking.

What is a “nervous breakdown”? Most of us have heard of a person having a nervous breakdown. What does this mean? “Nervous breakdown” is a popular term sometimes used to describe what has happened to a person who has Major Depressive Disorder or Bipolar Disorder. When depression is severe enough to prevent the person from functioning normally in daily life, or when the symptoms of depression are severe and appear suddenly, it may seem as if the person has “broken down.” Hallucinations (false perceptions) and delusions (false beliefs) can occur in episodes of Major Depressive Disorder and Bipolar Disorder.

Treatment of Depression

Fortunately, clinical depression is very treatable. The majority (80%-90%) of people who receive treatment experience significant improvement. Full recovery may take weeks or months. Early intervention increases the likelihood of positive results for those suffering from depression. There are two principal treatments for depression: medication and psychotherapy. For some, just one or the other may be sufficient. For others with more severe symptoms, a combination of both medication and psychotherapy is needed

to relieve suffering to return to full functioning, and to limit the risk of relapses. The precise treatment plan worked out between you and your clinician will depend upon the type and severity of your symptoms, your individual medical and family history, and your previous response to particular treatments. In the most severe cases of depression, when the person cannot function and safety is an issue, a brief hospital stay may be necessary. The following are some interventions that may be used to treat depression.

Medication. There are several types of modern antidepressants that are effective and safe. Antidepressants usually take full effect within 3-6 weeks after therapy has begun. If little or no improvement is noted after 6-8 weeks, your doctor will alter the dose of the medication or will add or substitute another antidepressant. Simply put, antidepressants work by affecting brain chemistry in complex ways that lead to relief of symptoms that are typical of clinical depression. Newer antidepressants have greatly improved safety and tolerability. It is important for you to tell your doctor(s) about side effects so that another dosage or other medications which may have fewer side effects can be tried. It is also important that you inform your doctor about other medications you may be taking in order to avoid any negative drug-drug interactions. Never discontinue medication without first consulting with your doctor(s). For individuals with Bipolar Disorder or chronic clinical depression, medication may have to be maintained indefinitely.

Psychotherapy. There are hundreds of studies that show psychotherapy to be effective in the treatment of clinical depression. Psychotherapy offers individuals the opportunity to identify and deal with the factors that contribute to their depression and to deal effectively with the psychological, behavioral, interpersonal and situational causes to

their depression. Psychotherapy will educate you about depression, help you understand your emotions and personality and help you cope with stresses and relationships.

Depending on the severity of the depression, treatment can take a few weeks or substantially longer. However, in many cases, significant improvement can be made in 10-15 sessions.

Psychotherapy in combination with antidepressants. Current research indicates that psychotherapy in combination with antidepressant medication can be more effective in treating depression than using only psychotherapy or only antidepressant medications alone. It is easier to understand how both psychotherapy and medication can have an effect on a biologically based illness like depression when you look at an analogous situation that exists with hypertension (high blood pressure). If you or someone you know suffers from high blood pressure, you know that sometimes blood pressure can be reduced through diet, exercise and stress reduction techniques; however, many people need to use medication as well in order to successfully bring their blood pressure under control.

Conclusion

Depression is never normal and always produces needless suffering. With proper diagnosis and treatment, depression can be overcome in the vast majority of people.

Major Depressive Disorder is a common illness that affects people of all ages and backgrounds. It is a medical illness, not a sign of personal weakness.

Depression requires treatment by a mental health or health professional. Effective treatments are available so every effort should be made to help depressed people get the help they need. If you think you or a loved one may have depression, make an

appointment to speak with a mental health or health professional, describe your concerns, and request a thorough medical or psychological evaluation.

Unfortunately, individuals may not recognize their symptoms as signs of an illness, or they may fear the reactions of coworkers, friends, and family. As a result, millions of people with depression do not seek treatment and unnecessarily experience problems at their jobs or in their relationships. The costs of depression can be severe. The estimated financial costs of depression in missed days at work, medical expenses, and premature death is \$43 billion annually! Remember, depression is one of the most treatable mental illnesses, and, with proper treatment, individuals can regain a healthy outlook on life.

To find a list of professionals in your community who have experience working with deaf and hard of hearing individuals and who can direct you in getting the proper evaluation screening and treatment, please visit the website of the Utah Association of the Deaf (UAD).

Most people find help through friends, their insurance company, their family doctor, or their ecclesiastical authority. Another resource is to check the Yellow Pages under “mental health” or “health.” Community deaf centers can be another resource for direction in finding a competent mental health professional. In times of crisis, the emergency room doctor at a hospital may be able to provide temporary help for an emotional problem, and will be able to tell you where and how to get further help.

We will now initiate a brief question and answer session. I will be happy to address any questions you may have at this time.

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APPENDIX F

Psychoeducational Lecture Transcript Two

The following 15 to 20 minute lecture should be delivered by a mental health professional who has experience working with diagnosing or treating depression. The goal of this lecture is to explicate and expound on the subject of depression. This lecture should be given after the first lecture that describes general aspects of depression.

Expounding on Depression

Is Depression Related to Suicide?

Suicide is closely associated with depression. Most people who take their own lives do so during a depressive episode. Unfortunately, the great majority of people who commit suicide are not in treatment at the time of their death. This is a considerable reason to stress the importance of seeking treatment for depression. Often with treatment and relief of depression, suicidal thoughts will disappear.

It is important to understand that suicide is not a normal reaction to a life crisis, adolescent turmoil, pressure at work, growing old, or being ill. On the contrary, it is indicative of an underlying illness and very often Major Depressive Disorder or Bipolar Disorder. Treatment of depression can and does save lives.

There is a myth that people who talk about suicide do not do it. If someone communicates suicidal plans or thoughts to you, a health care provider should be contacted immediately. Confidentiality should not be an issue when a person's life may be in danger. There are several ways you can help a friend or loved one who is suicidal:

Voice your concern — Take the initiative to ask what is troubling your friend or family member, and attempt to overcome any reluctance to talk about it. 75% percent of all suicides give some warning of their intentions to a friend or family member.

Let the person know you care and understand — Tell the person that he or she is not alone, that suicidal feelings, even though intense and seemingly all powerful, are temporary, that depression can be treated, and that problems can be solved.

Ask if the person has a specific plan for committing suicide and how far he or she has gone in carrying it out — It is not true that asking about suicide causes a person to think about or commit suicide – that is a myth.

Get professional help immediately — Bring that individual to a hospital emergency room or a local crisis center. If the individual is already in treatment, contact his or her clinician. Your friend or family member will be more likely to seek help if you accompany him or her. If the person refuses professional help, notify your local police, who are trained to handle situations like this.

In addition to the previously mentioned ways to help an individual who may be suicidal, it is important to never assume the situation will take care of itself; moreover, never leave the person alone, without supervision. Suicidal individuals will often try to make you promise to keep a secret to not share his or her suicidal wishes with anyone. Never be sworn to secrecy when someone indicates plans to commit suicide. Don't act shocked or surprised at what the person says and do not argue or debate moral issues. It is also important to never challenge or dare someone who has shared suicidal thoughts. We will now focus on how depression may affect different populations across the age span and gender.

Depression in Children and Adolescents

The features of depression in children and adolescents are much the same as in adults.

The child or adolescent's moodiness starts to interfere with his or her life. Parents may find that the child or adolescent's sadness makes them feel unhappy, and may begin to worry about the individual more often. In addition, the child or adolescent may get into more arguments with friends. Teachers may even voice concerns about the individual.

Because the depressed child or adolescent finds it difficult to concentrate, he or she may become less interested in schoolwork, and grades may suffer. There also may be a change in activity level. Activities and hobbies that used to be enjoyable now seem to be a burden or boring. Excuses are made to avoid seeing friends.

Because normal behaviors vary from one childhood stage to another, the key to recognizing depression in a child or adolescent is to look for consistencies in moodiness or sadness. If a period of sadness lasts for more than one to two months, treatment may be necessary. For example, typical moody teenagers may be sad or irritable one day and fine the next. They may be in a bad mood, but when an interesting activity comes up, they may quickly return to a normal mood. This is not true for clinically depressed adolescents, who usually find it difficult to snap out of their moodiness.

Several types of psychotherapy are used in treating childhood or adolescent depression.

Some of the more recently introduced antidepressants also appear to be effective and seem to have fewer side effects than antidepressants that were common a few years ago.

A diagnosis and decision about the most appropriate form of treatment can be made with a thorough medical or psychological evaluation.

Parents should not be afraid to ask the clinician questions such as: What are the therapist's qualifications? What kind of therapy will my child have? Will the family as a whole participate in therapy? Will my child's therapy include an antidepressant? If so, what might the side effects be?

College Students and Mental Health Disorders

For many college students, freshman year is their first experience living away from the safety and familiarity of home. This transition, coupled with the fact that many psychiatric disorders surface in the late teens or early twenties, leaves college-age students particularly vulnerable to developing health problems or depression. Statistics show the second leading cause of death in the college population is related to suicide. Over 30% of colleges had a student suicide in 2003.

How do college students learn to recognize symptoms of mental health problems in themselves and get the help they need to cope with them? Students should be encouraged to utilize the resources on his or her campus, especially the counseling and health centers. With support provided by clinicians at the college campus, or in the community if they are referred to off-campus providers, students can explore their emotions and learn how to cope through therapy sessions, medication, and lifestyle changes.

Depression and Older Adults

Is Depression a Normal Part of Aging?

Some people have the mistaken idea that it is normal for the elderly to feel depressed. Clinical depression is not a normal part of aging. Too often, family, caregivers, physicians and older people assume that depression is a "normal" response to the personal losses and physical ailments of aging. This is a myth. The reality is that

depression in the elderly is similar to depression in the general population. It is a treatable condition, with signs and symptoms similar to those of younger age groups. The research shows that older adults are generally reluctant to seek professional help for depression. Why do so few older adults seek treatment for depression? In many cases, symptoms of depression are confused with those of a physical illness, such as headaches, backaches and stomach problems or the side effects of medication. Because many people have lower functional expectations for the elderly, symptoms of depression are often attributed to declining physical health. This myth is perpetuated because older adults are more likely to complain of physical ailments than of depressed mood. People may also feel embarrassed about having psychological complaints. Some people experience their first depressive episode late in life and assume that the persistent, painful sadness is simply normal, untreatable grief over increasing losses of family, friends, financial security and physical well-being.

The good news is that depression usually improves with appropriate treatment. More than 80% of older adults suffering from depression find relief with psychotherapy, antidepressant medication, or the combination thereof. When prescribing antidepressant medication for older adults, careful attention must be paid to the dosage to minimize risks of adverse effects and to avoid interactions with other medication(s). For this reason, the patient's responses to medication should be closely monitored. Peer groups are also an effective component of comprehensive care for older adults with depression.

Once an individual acknowledges that he or she is depressed and receives the proper treatment, he or she should begin to feel more energetic, hopeful, focused and involved in daily activities. Improved recognition and treatment of depression in late life will make

those years more enjoyable and fulfilling for the depressed elderly person, the family, and caretakers.

Depression in Women

Women experience depression about twice as often as men. Many hormonal factors may contribute to the increased rate of depression in women—particularly such factors as menstrual cycle changes, pregnancy, miscarriage, postpartum period, pre-menopause, and menopause. Many women also face additional stresses such as responsibilities both at work and home, single parenthood, and caring for children and for aging parents.

A recent study showed that in the case of severe premenstrual syndrome (PMS), women with a preexisting vulnerability to PMS experienced relief from mood and physical symptoms when their sex hormones were suppressed. Shortly after the hormones were re-introduced, they again developed symptoms of PMS. Women without a history of PMS reported no effects of the hormonal manipulation.

Many women are also particularly vulnerable after the birth of a baby. Postpartum depression can be different from other forms of clinical depression in that it is the result of a (usually) positive rather than negative event. The hormonal and physical changes, as well as the added responsibility of a new life, can be factors that lead to postpartum depression in some women. While transient “baby blues” are common in new mothers, a full-blown persistent depressive episode is not a normal occurrence and requires active intervention. Treatment by a sympathetic physician and the family’s emotional support for the new mother are prime considerations in aiding her to recover her physical and mental well-being and her ability to care for and enjoy the infant.

Depression in Men

Although men are less likely to suffer from depression than women, 3 to 4 million men in the United States are affected by the illness. Men are less likely to admit to depression, and doctors are less likely to suspect it. The rate of suicide in men is four times that of women, though more women attempt it. In fact, after age 70, the rate of men's suicide rises, reaching a peak after age 85.

Depression can also affect the physical health in men differently from women. A new study shows that, although depression is associated with an increased risk of coronary heart disease in both men and women, only men suffer a high death rate.

Men's depression is often masked by alcohol or drugs, or by the socially acceptable habit of working excessively long hours. Depression typically shows up in men not as feeling hopeless and helpless, but as being irritable, angry, and discouraged; hence, depression may be difficult to recognize as such in men. Even if a man realizes that he is depressed, he may be less willing than a woman to seek help. Encouragement and support from concerned family members can make a difference. In the workplace, employee assistance professionals or worksite mental health programs can be of assistance in helping men understand and accept depression as a real illness that needs treatment.

Bipolar Disorder

Bipolar Disorder is much more common than once thought. It is a mental illness involving episodes of mania and serious depression. The person's mood usually swings from overly "high," excited, or irritable, to sad and hopeless, and then back again, with periods of normal mood in between. The high mood associated with Bipolar Disorder, which is called the "manic phase," is sometimes a pleasurable, euphoric and productive

state, but can involve potentially dangerous lapses in judgment, impulsive and potentially ruinous behaviors, and in the most severe forms can involve extreme agitation with loss of reason (psychosis) which may require emergency hospitalization. When in the depressed cycle, an individual can have any or all of the symptoms of a depressive disorder. When in the manic cycle, the individual may be overactive, overtalkative, and have a great deal of energy. Mania often affects thinking, judgment, and social behavior in ways that cause serious problems and embarrassment. For example, the individual in a manic phase may feel elated, full of grand schemes that might range from unwise business decisions to romantic sprees. Mania, left untreated, may worsen to a psychotic state.

Types of Bipolar Disorder and Prevalence

Bipolar Disorder is, in turn, subdivided into two types with the main difference being the severity of the manic episodes. Type I Bipolar Disorder includes severely elevated mood and sometimes irrational or psychotic symptoms (mania). In Type II Bipolar Disorder, the highs are milder (hypomania) and may escape notice without close evaluation. Both Type I and Type II Bipolar Disorder have depressive cycles that include some or all of the symptoms of Major Depressive Disorder. Bipolar Disorder, unlike Major Depressive Disorder, occurs about equally in men and women.

Treatment of Bipolar Disorder

Treatment of Bipolar Disorder requires special care since heavy use of antidepressants can destabilize mood or induce mania or psychotic agitation in some patients. Various forms of psychotherapies are also considered to be useful in the comprehensive care of people with Bipolar Disorder. Some Bipolar Disorder patients are reluctant to accept

their diagnosis or the need for long-term care, particularly early in the course of the disorder. With sustained treatment, most Bipolar Disorder patients do quite well.

It is important to remember that the key to preventing relapse of clinical depression, no matter its type, appears to be to continue the therapy- whether it's psychotherapy, antidepressants, or both- even after the depressive symptoms have gone.

Conclusion

Remember, depression is never normal and can result in disastrous consequences, such as suicide, without proper diagnosis and treatment. Depression or Bipolar Disorder can affect anyone; it affects men and women, young and old, and people of all races, religions, cultures, and incomes. Depression and Bipolar Disorder are medical illnesses, not a sign of personal weakness.

Depression requires treatment by a mental health or health professional. Effective treatments are available so every effort should be made to help depressed people get the help they need. Remember, most people who seek treatment recover from depression. If you feel you or a loved one is suffering from a depressive disorder, make an appointment to speak with a community mental health or health professional, describe your concerns, and request a thorough medical or psychological evaluation. You will feel better.

As mentioned previously, a list of mental health professionals in your community who have experience working with deaf and hard of hearing individuals and can direct you in getting the proper evaluation screening and treatment is available on the UAD website. Another option is to check the Yellow Pages under the appropriate directory topic for other resources. It is critical to remember that in times of crisis, the emergency room doctor at a hospital may be able to provide temporary help for an emotional problem, and

will be able to tell you where and how to get further help.

Thank you for your time and attention. I will be happy to answer any questions you may have at this point.

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APPENDIX G

Reminder Handout Flyer with Information for Returning One Week Later



APPENDIX H

Beck Depression Inventory – II



Date: _____

Name: _____ Marital Status: _____ Age: _____ Sex: _____
 Occupation: _____ Education: _____

Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today**. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness

- 0 I do not feel sad.
- 1 I feel sad much of the time.
- 2 I am sad all the time.
- 3 I am so sad or unhappy that I can't stand it.

2. Pessimism

- 0 I am not discouraged about my future.
- 1 I feel more discouraged about my future than I used to be.
- 2 I do not expect things to work out for me.
- 3 I feel my future is hopeless and will only get worse.

3. Past Failure

- 0 I do not feel like a failure.
- 1 I have failed more than I should have.
- 2 As I look back, I see a lot of failures.
- 3 I feel I am a total failure as a person.

4. Loss of Pleasure

- 0 I get as much pleasure as I ever did from the things I enjoy.
- 1 I don't enjoy things as much as I used to.
- 2 I get very little pleasure from the things I used to enjoy.
- 3 I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings

- 0 I don't feel particularly guilty.
- 1 I feel guilty over many things I have done or should have done.
- 2 I feel quite guilty most of the time.
- 3 I feel guilty all of the time.

6. Punishment Feelings

- 0 I don't feel I am being punished.
- 1 I feel I may be punished.
- 2 I expect to be punished.
- 3 I feel I am being punished.

7. Self-Dislike

- 0 I feel the same about myself as ever.
- 1 I have lost confidence in myself.
- 2 I am disappointed in myself.
- 3 I dislike myself.

8. Self-Criticalness

- 0 I don't criticize or blame myself more than usual.
- 1 I am more critical of myself than I used to be.
- 2 I criticize myself for all of my faults.
- 3 I blame myself for everything bad that happens.

9. Suicidal Thoughts or Wishes

- 0 I don't have any thoughts of killing myself.
- 1 I have thoughts of killing myself, but I would not carry them out.
- 2 I would like to kill myself.
- 3 I would kill myself if I had the chance.

10. Crying

- 0 I don't cry anymore than I used to.
- 1 I cry more than I used to.
- 2 I cry over every little thing.
- 3 I feel like crying, but I can't.

Subtotal Page 1

Continued on Back

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11. Agitation

- 0 I am no more restless or wound up than usual.
- 1 I feel more restless or wound up than usual.
- 2 I am so restless or agitated that it's hard to stay still.
- 3 I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest

- 0 I have not lost interest in other people or activities.
- 1 I am less interested in other people or things than before.
- 2 I have lost most of my interest in other people or things.
- 3 It's hard to get interested in anything.

13. Indecisiveness

- 0 I make decisions about as well as ever.
- 1 I find it more difficult to make decisions than usual.
- 2 I have much greater difficulty in making decisions than I used to.
- 3 I have trouble making any decisions.

14. Worthlessness

- 0 I do not feel I am worthless.
- 1 I don't consider myself as worthwhile and useful as I used to.
- 2 I feel more worthless as compared to other people.
- 3 I feel utterly worthless.

15. Loss of Energy

- 0 I have as much energy as ever.
- 1 I have less energy than I used to have.
- 2 I don't have enough energy to do very much.
- 3 I don't have enough energy to do anything.

16. Changes in Sleeping Pattern

- 0 I have not experienced any change in my sleeping pattern.

- 1a I sleep somewhat more than usual.
- 1b I sleep somewhat less than usual.

- 2a I sleep a lot more than usual.
- 2b I sleep a lot less than usual.

- 3a I sleep most of the day.
- 3b I wake up 1-2 hours early and can't get back to sleep.

17. Irritability

- 0 I am no more irritable than usual.
- 1 I am more irritable than usual.
- 2 I am much more irritable than usual.
- 3 I am irritable all the time.

18. Changes in Appetite

- 0 I have not experienced any change in my appetite.

- 1a My appetite is somewhat less than usual.
- 1b My appetite is somewhat greater than usual.

- 2a My appetite is much less than before.
- 2b My appetite is much greater than usual.

- 3a I have no appetite at all.
- 3b I crave food all the time.

19. Concentration Difficulty

- 0 I can concentrate as well as ever.
- 1 I can't concentrate as well as usual.
- 2 It's hard to keep my mind on anything for very long.
- 3 I find I can't concentrate on anything.

20. Tiredness or Fatigue

- 0 I am no more tired or fatigued than usual.
- 1 I get more tired or fatigued more easily than usual.
- 2 I am too tired or fatigued to do a lot of the things I used to do.
- 3 I am too tired or fatigued to do most of the things I used to do.

21. Loss of Interest in Sex

- 0 I have not noticed any recent change in my interest in sex.
- 1 I am less interested in sex than I used to be.
- 2 I am much less interested in sex now.
- 3 I have lost interest in sex completely.

NOTICE: This form is printed with both blue and black ink. If your copy does not appear this way, it has been photocopied in violation of copyright laws.

Subtotal Page 2

Subtotal Page 1

APPENDIX I

Beck Hopelessness Scale



Date: _____

Name: _____ Marital Status: _____ Age: _____ Sex: _____

Occupation: _____ Education: _____

This questionnaire consists of 20 statements. Please read the statements carefully one by one. If the statement describes your attitude for the **past week including today**, darken the circle with a 'T' indicating TRUE in the column next to the statement. If the statement does not describe your attitude, darken the circle with an 'F' indicating FALSE in the column next to this statement. **Please be sure to read each statement carefully.**

- | | | |
|--|-------------------------|-------------------------|
| 1. I look forward to the future with hope and enthusiasm. | <input type="radio"/> T | <input type="radio"/> F |
| 2. I might as well give up because there is nothing I can do about making things better for myself. | <input type="radio"/> T | <input type="radio"/> F |
| 3. When things are going badly, I am helped by knowing that they cannot stay that way forever. | <input type="radio"/> T | <input type="radio"/> F |
| 4. I can't imagine what my life would be like in ten years. | <input type="radio"/> T | <input type="radio"/> F |
| 5. I have enough time to accomplish the things I want to do. | <input type="radio"/> T | <input type="radio"/> F |
| 6. In the future, I expect to succeed in what concerns me most. | <input type="radio"/> T | <input type="radio"/> F |
| 7. My future seems dark to me. | <input type="radio"/> T | <input type="radio"/> F |
| 8. I happen to be particularly lucky, and I expect to get more of the good things in life than the average person. | <input type="radio"/> T | <input type="radio"/> F |
| 9. I just can't get the breaks, and there's no reason I will in the future. | <input type="radio"/> T | <input type="radio"/> F |
| 10. My past experiences have prepared me well for the future. | <input type="radio"/> T | <input type="radio"/> F |
| 11. All I can see ahead of me is unpleasantness rather than pleasantness. | <input type="radio"/> T | <input type="radio"/> F |
| 12. I don't expect to get what I really want. | <input type="radio"/> T | <input type="radio"/> F |
| 13. When I look ahead to the future, I expect that I will be happier than I am now. | <input type="radio"/> T | <input type="radio"/> F |
| 14. Things just don't work out the way I want them to. | <input type="radio"/> T | <input type="radio"/> F |
| 15. I have great faith in the future. | <input type="radio"/> T | <input type="radio"/> F |
| 16. I never get what I want, so it's foolish to want anything. | <input type="radio"/> T | <input type="radio"/> F |
| 17. It's very unlikely that I will get any real satisfaction in the future. | <input type="radio"/> T | <input type="radio"/> F |
| 18. The future seems vague and uncertain to me. | <input type="radio"/> T | <input type="radio"/> F |
| 19. I can look forward to more good times than bad times. | <input type="radio"/> T | <input type="radio"/> F |
| 20. There's no use in really trying to get anything I want because I probably won't get it. | <input type="radio"/> T | <input type="radio"/> F |

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18 19 20 A B C D E

APPENDIX J

Depression Knowledge Questionnaires

PRETEST I

Name: _____ Date: _____

1. If a biochemical imbalance were the cause of a person's depression, the latest research would lead us to expect to find that person to have:
 - A) an abnormality in the activity of certain neurotransmitters, especially serotonin and norepinephrine
 - B) especially high levels of the neurotransmitters dopamine and acetylcholine, and their metabolites
 - C) particularly low levels of the neurotransmitters cortisol and melatonin, as measured by their metabolites
 - D) all of the above

2. Which of the following would be the best way to receive treatment for clinical depression?
 - A) make an appointment to speak with a mental health or health professional, describe your concerns, and request a thorough evaluation
 - B) talk to a friend or family member in order to feel better
 - C) get some strenuous exercise
 - D) clinical depression cannot be treated

3. Significant improvement in clinical depression can usually be made in how many session(s) of psychotherapy?
 - A) 1 session
 - B) 3 - 5 sessions
 - C) 10 - 15 sessions
 - D) psychotherapy is not effective in treating clinical depression

4. Various symptoms of clinical depression can include:
 - A) hallucinations (false perceptions such as hearing voices or seeing things)
 - B) feelings of worthlessness (inappropriate guilt)
 - C) delusions (false beliefs)
 - D) all of the above

5. What percentage of individuals who receive treatment for depression experience significant improvement?
 - A) 40% - 60%
 - B) 50% - 70%
 - C) 80% - 90%
 - D) less than 40%

6. Compared to the general population, deaf individuals are more likely to:
 - A) suffer from panic attacks
 - B) have higher serotonin levels
 - C) be depressed
 - D) experience manic episodes

7. Depression can result in:
 - A) disturbances that are only physical in nature
 - B) disturbances that are only limited to the mind
 - C) serious disturbances with work, social, and bodily functioning
 - D) depression does not cause any kind of serious disturbance

8. How is clinical depression different from the "blues"?
 - A) clinical depression responds to a change of circumstances
 - B) ordering pizza and watching a movie will help with clinical depression
 - C) clinical depression does not respond to pleasurable activities
 - D) clinical depression does not last as long as the "blues"

9. All the pleasure has gone out of life for Trevor. Things he used to find fun and exciting no longer give him any joy. He finds he wakes up early in the morning and has no appetite. This has been going on for several weeks. What might be wrong with Trevor?
 - A) there's nothing wrong with Trevor; he is just going through normal life experiences
 - B) Trevor may be exhibiting symptoms of Major Depressive Disorder
 - C) Trevor has chosen to behave this way
 - D) Trevor is not being righteous enough to be happy

10. Seasonal Affective Disorder is thought to be caused by which of the following?
 - A) increased stress during the holiday season
 - B) increase in food consumption during the winter months
 - C) disappointment with the change of seasons
 - D) decreased sunlight as the days shorten in the winter

11. Clinical depression and other disorders of a psychological nature are considered to be a(n):
- A) weakness
 - B) illness
 - C) behavioral problem
 - D) motivational issue
12. Which of the following is considered to be the most common type of depression?
- A) Major Depressive Disorder
 - B) Dysthymia
 - C) Bipolar Disorder
 - D) Adjustment Disorder
13. Resources for getting treatment with clinical depression or any other disorders of a psychological nature can be found in which of the following?
- A) Yellow Pages
 - B) the Internet
 - C) community centers (deaf centers)
 - D) all of the above
14. Left untreated, a mild episode of depression can:
- A) progress into a disabling condition
 - B) take much longer to overcome
 - C) increase the risk of a return episode
 - D) all of the above
15. Which of the following is considered to be one cause of depression?
- A) a weak personality
 - B) willpower
 - C) stressful life events
 - D) certain age ranges
16. The estimated financial costs of depression in missed days at work, medical expenses, and premature death is:
- A) \$800,000 annually
 - B) \$3 million annually
 - C) \$17 million annually
 - D) \$43 billion annually

17. Your best advice to a friend who is experiencing clinical depression would be:
- A) "Try psychotherapy; it's the best therapy for clinical depression."
 - B) "Just give it some time, you will feel better soon."
 - C) "Antidepressant medication should work better than anything else."
 - D) "Try combining psychotherapy with antidepressant medication."
18. Which type of clinical depression is considered to be a milder form of depression with symptoms lasting two years or more?
- A) Bipolar Disorder
 - B) Season Affective Disorder
 - C) Dysthymia
 - D) Adjustment Disorder
19. When taking an antidepressant medication for clinical depression, it is important to share with your doctor(s) which of the following?
- A) side effects experienced while taking the medication
 - B) other medications you may currently be taking
 - C) any plans to discontinue the antidepressants
 - D) all of the above
20. When health professionals describe depression as being "comorbid," this means that the individual's case of clinical depression is:
- A) co-occurring with other illnesses
 - B) considered to be psychological
 - C) exhibiting physical symptoms
 - D) due to an imbalance of neurotransmitters in the brain
21. According to the National Institute of Mental Health, depression affects approximately _____ Americans each year.
- A) 20.9 million
 - B) 2.6 million
 - C) 30.4 million
 - D) 11.9 million
22. What type of personality factor(s) would be most likely to play a role in depression?
- A) "excessive energy and always on the go" personalities
 - B) "conscientious and gregarious" personalities
 - C) "pessimistic and easily stressed out with problems that arise" personalities
 - D) personality factor(s) does not play a role in depression

23. People may NOT seek out treatment for clinical depression because:
- A) talking about depression can make it worse
 - B) clinical depression is considered to be a normal part of life
 - C) clinical depression is not treatable
 - D) he or she does not recognize symptoms as signs of an illness
24. When a person has a "nervous breakdown," what does this usually mean?
- A) the person has been frightened or scared to the point of traumatic distress
 - B) the person has been "nervous" for too long and cannot carry out daily activities
 - C) depression is severe enough to prevent the person from functioning normally in daily life
 - D) the person has been admitted to a hospital
25. Which of the following is true about research on the effectiveness of psychotherapy for treating clinical depression?
- A) it is no more effective than placebo therapy
 - B) hundreds of studies show its effectiveness
 - C) psychotherapy only works for some people
 - D) although people become less depressed, their thought patterns don't change

Answer Key (Pretest I)

1. A
2. A
3. C
4. D
5. C
6. C
7. C
8. C
9. B
10. D
11. B
12. A
13. D
14. D
15. C
16. D
17. D
18. C
19. D
20. A
21. A
22. C
23. D
24. C
25. B

POSTTEST I

Name: _____ Date: _____

1. Left untreated, a mild episode of depression can:
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 - C) be depressed
 - D) experience manic episodes

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 - B) Season Affective Disorder
 - C) Dysthymia
 - D) Adjustment Disorder
25. Resources for getting treatment with clinical depression or any other disorders of a psychological nature can be found in which of the following?
- A) Yellow Pages
 - B) the Internet
 - C) community centers (deaf centers)
 - D) all of the above

Answer Key (Posttest I)

1. D
2. B
3. C
4. D
5. A
6. A
7. C
8. C
9. C
10. A
11. D
12. C
13. D
14. D
15. B
16. D
17. A
18. B
19. C
20. A
21. D
22. D
23. C
24. C
25. D

PRETEST II

Name: _____ Date: _____

1. Which of the following might be considered a key to preventing relapse of clinical depression?
 - A) continuing the therapy, no matter its type, even after the symptoms have gone
 - B) always avoiding negative thoughts
 - C) receiving individual attention from a therapist, but no particular therapy
 - D) family support

2. If left untreated, mania may:
 - A) lead to becoming acutely aware of excessive behaviors
 - B) worsen to a psychotic state
 - C) almost never recur again
 - D) lead to an eating disorder

3. Which of the following is true concerning clinical depression?
 - A) not much is known about treating depression
 - B) the risk of experiencing depression appears to be declining
 - C) poorer people are more likely to experience depression than wealthier people
 - D) most people who seek treatment recover from depression

4. Which of the following is true concerning suicide in men as compared to women?
 - A) the rate of suicide in women is higher than that of men
 - B) men do not suffer from depression- only women do; thus, women are more likely to commit suicide
 - C) the rate of suicide in men is four times that of women, though more women attempt it
 - D) there is no difference in suicide rates between men and women

5. Asking a person about suicidal thoughts or plans:
 - A) causes a person to think more about suicide
 - B) causes a person to commit suicide
 - C) does not cause a person to commit suicide
 - D) will make the person more depressed

6. What percent of colleges in the U.S. had a student suicide in 2003?
 - A) 2%
 - B) 10%
 - C) 15%
 - D) 30%

7. Clinical depression in the elderly is:
 - A) a normal part of aging
 - B) due to physical illnesses
 - C) not a normal part of aging
 - D) due to the death of friends and family

8. Which of the following is NOT considered a major risk factor for clinical depression?
 - A) having had previous depressive episodes
 - B) being a woman
 - C) family history of a mood disorder
 - D) being bored much of the time

9. Since immediately after the birth of her son, Maria has experienced a period of sadness that interferes with her ability to take care of him. She has never felt this way before. The sadness Maria is feeling is persistent and will not go away. The depression Maria is experiencing is:
 - A) normal "baby blues"
 - B) not a normal occurrence and requires active intervention
 - C) due to improper nutrition
 - D) Maria is doing something wrong and is causing her own depression

10. Elderly individuals may be reluctant to seek professional help for clinical depression because:
 - A) symptoms of depression are confused with those of a physical illness
 - B) elderly individuals and their family may attribute the persistent, painful sadness as being a normal part of aging
 - C) embarrassment about having psychological complaints
 - D) all of the above

11. Which of the following symptoms would most likely indicate a clinically depressed teenager as opposed to a normally moody teenager?
 - A) taking offense easily
 - B) finding it difficult to snap out of his or her moodiness
 - C) arguing with his or her parents
 - D) being sad and irritable one day and fine the next

12. Postpartum depression is different from other forms of depression in that:
 - A) typical treatment approaches are not effective
 - B) it typically follows a positive event
 - C) it occurs in men more often than women
 - D) all of the above

13. If someone communicates suicidal thoughts or plans to you, you should:
 - A) tell the person that what he or she has said is morally wrong
 - B) not worry - people who talk about suicide usually don't commit suicide
 - C) protect the individual's confidentiality so as to prevent embarrassment to the individual
 - D) contact a health care provider immediately

14. Bipolar Disorder compared to Major Depressive Disorder:
 - A) occurs more often in men than in women
 - B) usually evolves into dysthymia
 - C) occurs about equally in men and women
 - D) is not considered to be an illness

15. Which of the following is most likely associated with clinical depression?
 - A) suicide
 - B) an evil spirit
 - C) getting in an argument with someone
 - D) failing at something

16. Which of the following is NOT true for someone experiencing a manic phase?
 - A) the individual may be overactive, overtalkative, and have a great deal of energy
 - B) mania often affects thinking, judgment, and social behavior in ways that cause serious problems and embarrassment
 - C) the manic state is never a pleasant experience
 - D) the individual in a manic phase may make unwise business decisions or go on romantic sprees

17. Eleven-year-old Johnny's persistent moodiness has caused his parents and teachers to become concerned. Both Johnny's parents and teachers have noticed his tendency to argue with his friends. Johnny also has difficulty concentrating and will not do his homework. What might be wrong with Johnny?
- A) he could be experiencing symptoms of clinical depression
 - B) nothing is wrong with Johnny, behaviors vary from one childhood stage to another
 - C) Johnny is normal - children do not experience clinical depression
 - D) Johnny's parents have raised Johnny incorrectly
18. Particular risk factors associated with depression in women includes all of the following except:
- A) menstrual cycle changes
 - B) postpartum period
 - C) menopause
 - D) increased financial problems
19. Thoughts of suicide are considered to be a(n):
- A) normal reaction to a life crisis
 - B) indication of an underlying illness
 - C) typical result from adolescent turmoil
 - D) all of the above
20. Which person is at greatest risk for developing clinical depression?
- A) a poor child from a developing country
 - B) a middle-class American woman
 - C) an African American man
 - D) a wealthy European college student
21. One who alternates from mild highs (hypomania) to symptoms of clinical depression might be experiencing:
- A) Type I Bipolar Disorder
 - B) Type II Bipolar Disorder
 - C) Major Depressive Disorder
 - D) Adjustment Disorder

22. Which of the following is true concerning depression in men?
- A) men's depression is often masked by alcohol or drugs
 - B) men's depression is often masked by the socially acceptable habit of working excessively long hours
 - C) depression typically shows up in men not as feeling hopeless and helpless, but as being irritable, angry, and discouraged
 - D) all of the above
23. College-age students can be particularly vulnerable to developing health problem(s) because:
- A) freshman year is their first experience living away from the safety and familiarity of home
 - B) many psychiatric disorders surface in the late teens or early twenties
 - C) going to college can make you depressed
 - D) both A and B
24. Clinical depression requires treatment by:
- A) a friend you trust
 - B) clinical depression can not be treated
 - C) a mental health or health professional
 - D) using an herbal remedy
25. The difference between bipolar I disorder and bipolar II disorder is:
- A) the number of depressive and manic episodes.
 - B) the severity of the manic episodes.
 - C) the number of depressive episodes.
 - D) the seasonal variation in the episodes.

Answer Key (Pretest II)

1. A
2. B
3. D
4. C
5. C
6. D
7. C
8. D
9. B
10. D
11. B
12. B
13. D
14. C
15. A
16. C
17. A
18. D
19. B
20. B
21. B
22. D
23. D
24. C
25. B

POSTTEST II

Name: _____ Date: _____

1. Which person is at greatest risk for developing clinical depression?
 - A) a poor child from a developing country
 - B) a middle-class American woman
 - C) an African American man
 - D) a wealthy European college student

2. Which of the following symptoms would most likely indicate a clinically depressed teenager as opposed to a normally moody teenager?
 - A) taking offense easily
 - B) finding it difficult to snap out of his or her moodiness
 - C) arguing with his or her parents
 - D) being sad and irritable one day and fine the next

3. Which of the following is most likely associated with clinical depression?
 - A) suicide
 - B) an evil spirit
 - C) getting in an argument with someone
 - D) failing at something

4. One who alternates from mild highs (hypomania) to symptoms of clinical depression might be experiencing:
 - A) Type I Bipolar Disorder
 - B) Type II Bipolar Disorder
 - C) Major Depressive Disorder
 - D) Adjustment Disorder

5. Clinical depression in the elderly is:
 - A) a normal part of aging
 - B) due to physical illnesses
 - C) not a normal part of aging
 - D) due to the death of friends and family

6. Clinical depression requires treatment by:
 - A) a friend you trust
 - B) clinical depression can not be treated
 - C) a mental health or health professional
 - D) using an herbal remedy

7. Bipolar Disorder compared to Major Depressive Disorder:
 - A) occurs more often in men than in women
 - B) usually evolves into dysthymia
 - C) occurs about equally in men and women
 - D) is not considered to be an illness

8. If left untreated, mania may:
 - A) lead to becoming acutely aware of excessive behaviors
 - B) worsen to a psychotic state
 - C) almost never recur again
 - D) lead to an eating disorder

9. Which of the following is NOT considered a major risk factor for clinical depression?
 - A) having had previous depressive episodes
 - B) being a woman
 - C) family history of a mood disorder
 - D) being bored much of the time

10. Particular risk factors associated with depression in women includes all of the following except:
 - A) menstrual cycle changes
 - B) postpartum period
 - C) menopause
 - D) increased financial problems

11. The difference between bipolar I disorder and bipolar II disorder is:
 - A) the number of depressive and manic episodes.
 - B) the severity of the manic episodes.
 - C) the number of depressive episodes.
 - D) the seasonal variation in the episodes.

12. Which of the following is true concerning clinical depression?
- A) not much is known about treating depression
 - B) the risk of experiencing depression appears to be declining
 - C) poorer people are more likely to experience depression than wealthier people
 - D) most people who seek treatment recover from depression
13. If someone communicates suicidal thoughts or plans to you, you should:
- A) tell the person that what he or she has said is morally wrong
 - B) not worry - people who talk about suicide usually don't commit suicide
 - C) protect the individual's confidentiality so as to prevent embarrassment to the individual
 - D) contact a health care provider immediately
14. Asking a person about suicidal thoughts or plans:
- A) causes a person to think more about suicide
 - B) causes a person to commit suicide
 - C) does not cause a person to commit suicide
 - D) will make the person more depressed
15. Eleven-year-old Johnny's persistent moodiness has caused his parents and teachers to become concerned. Both Johnny's parents and teachers have noticed his tendency to argue with his friends. Johnny also has difficulty concentrating and will not do his homework. What might be wrong with Johnny?
- A) he could be experiencing symptoms of clinical depression
 - B) nothing is wrong with Johnny, behaviors vary from one childhood stage to another
 - C) Johnny is normal - children do not experience clinical depression
 - D) Johnny's parents have raised Johnny incorrectly
16. College-age students can be particularly vulnerable to developing health problem(s) because:
- A) freshman year is their first experience living away from the safety and familiarity of home
 - B) many psychiatric disorders surface in the late teens or early twenties
 - C) going to college can make you depressed
 - D) both A and B

17. What percent of colleges in the U.S. had a student suicide in 2003?
- A) 2%
 - B) 10%
 - C) 15%
 - D) 30%
18. Elderly individuals may be reluctant to seek professional help for clinical depression because:
- A) symptoms of depression are confused with those of a physical illness
 - B) elderly individuals and their family may attribute the persistent, painful sadness as being a normal part of aging
 - C) embarrassment about having psychological complaints
 - D) all of the above
19. Which of the following is true concerning suicide in men as compared to women?
- A) the rate of suicide in women is higher than that of men
 - B) men do not suffer from depression- only women do; thus, women are more likely to commit suicide
 - C) the rate of suicide in men is four times that of women, though more women attempt it
 - D) there is no difference in suicide rates between men and women
20. Thoughts of suicide are considered to be a(n):
- A) normal reaction to a life crisis
 - B) indication of an underlying illness
 - C) typical result from adolescent turmoil
 - D) all of the above
21. Which of the following might be considered a key to preventing relapse of clinical depression?
- A) continuing the therapy, no matter its type, even after the symptoms have gone
 - B) always avoiding negative thoughts
 - C) receiving individual attention from a therapist, but no particular therapy
 - D) family support

22. Which of the following is NOT true for someone experiencing a manic phase?
- A) the individual may be overactive, overtalkative, and have a great deal of energy
 - B) mania often affects thinking, judgment, and social behavior in ways that cause serious problems and embarrassment
 - C) the manic state is never a pleasant experience
 - D) the individual in a manic phase may make unwise business decisions or go on romantic sprees
23. Which of the following is true concerning depression in men?
- A) men's depression is often masked by alcohol or drugs
 - B) men's depression is often masked by the socially acceptable habit of working excessively long hours
 - C) depression typically shows up in men not as feeling hopeless and helpless, but as being irritable, angry, and discouraged
 - D) all of the above
24. Postpartum depression is different from other forms of depression in that:
- A) typical treatment approaches are not effective
 - B) it typically follows a positive event
 - C) it occurs in men more often than women
 - D) all of the above
25. Since immediately after the birth of her son, Maria has experienced a period of sadness that interferes with her ability to take care of him. She has never felt this way before. The sadness Maria is feeling is persistent and will not go away. The depression Maria is experiencing is:
- A) normal "baby blues"
 - B) not a normal occurrence and requires active intervention
 - C) due to improper nutrition
 - D) Maria is doing something wrong and is causing her own depression

Answer Key (Posttest II)

1. B
2. B
3. A
4. B
5. C
6. C
7. C
8. B
9. D
10. D
11. B
12. D
13. D
14. C
15. A
16. D
17. D
18. D
19. C
20. B
21. A
22. C
23. D
24. B
25. B

APPENDIX K

Test Construction Validation Questions

Please write down your comments to the following questions concerning the questionnaire created in class.

- 1) Do all of the items appear to have good face validity?

- 2) Does this questionnaire appear to have good content validity? That is, do the items as a whole adequately measure the construct domain it was intended to measure?

- 3) Is agreement bias (to acquiescence) adequately controlled? That is, are approximately half of the items reverse scored?

- 4) What about defensive bias? Is this adequately controlled? Are approximately half of the items positively worded and the other half negatively worded?

- 5) Are there any double barreled or vague and ambiguous items within the questionnaire? If so, which ones?

- 6) Are there any items that may constrict the variance? (Potential floor/ceiling effects)

- 7) What items may be candidates for revising or dropping?

APPENDIX L

Statistics and Graphs for Depression Knowledge Questionnaire Validation Process

Table 2

Item Analysis of Depression Knowledge Pretest I

Test	N	Mean	SD	$r_{xx'}$	SEM
Pretest I	17	17.5	1.97	.08	1.89

Figure 2

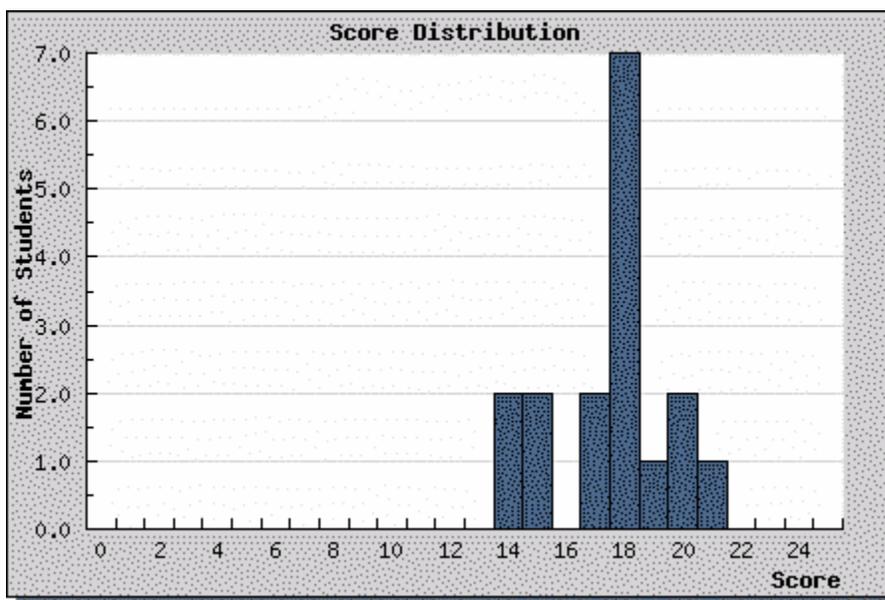
Score Distribution Histogram for Depression Knowledge Pretest I

Table 3

Item Analysis of Depression Knowledge Posttest I

Test	N	Mean	SD	$r_{xx'}$	SEM
Posttest I	17	24.1	1.18	.45	.88

Figure 3

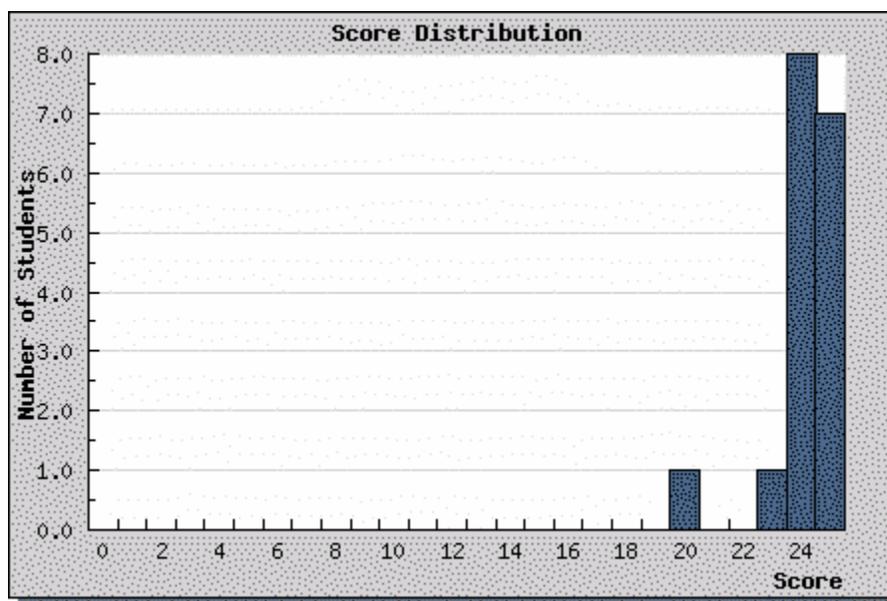
Score Distribution Histogram for Depression Knowledge Posttest I

Table 4

Item Analysis of Depression Knowledge Pretest II

Test	N	Mean	SD	$r_{xx'}$	SEM
Pretest II	17	19.8	2.65	.57	1.75

Figure 4

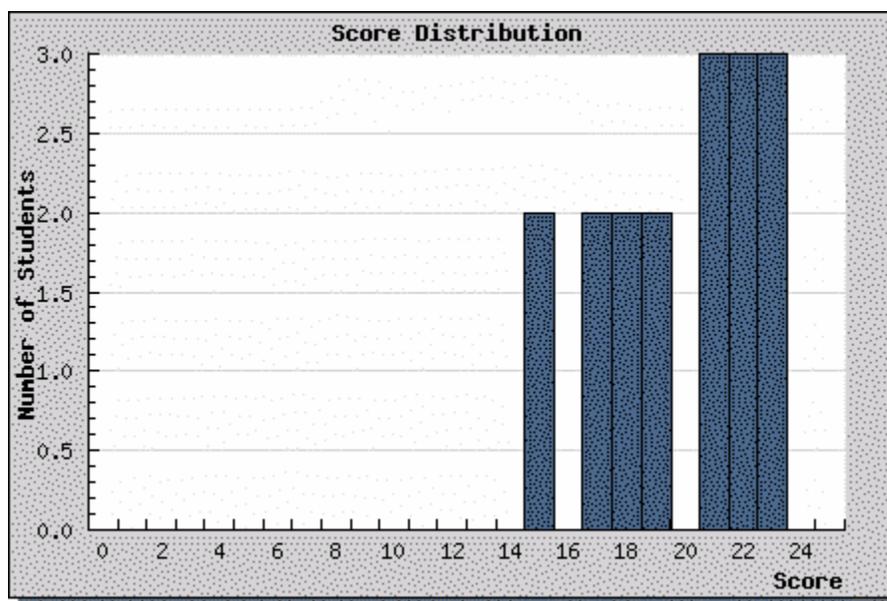
Score Distribution Histogram for Depression Knowledge Pretest II

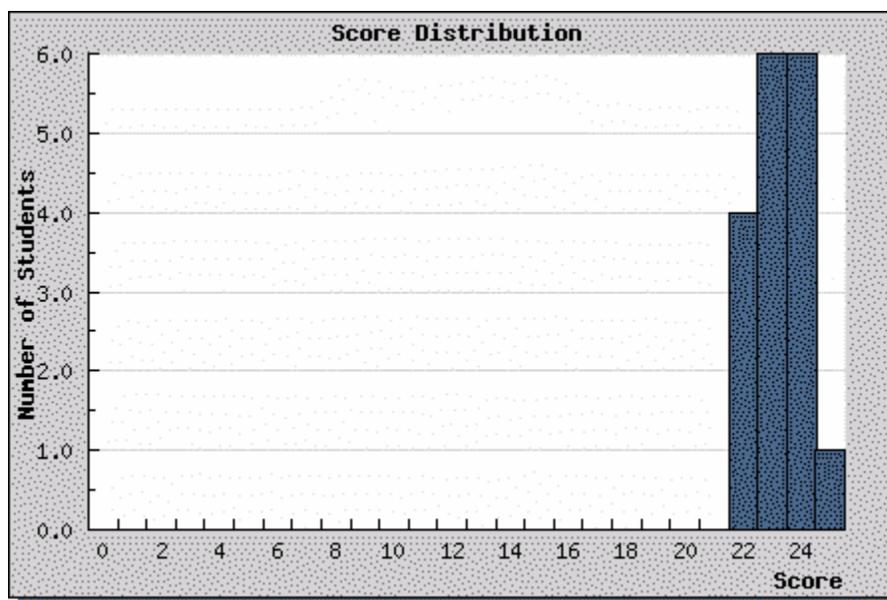
Table 5

Item Analysis of Depression Knowledge Posttest II

Test	N	Mean	SD	$r_{xx'}$	SEM
Pretest II	17	23.2	.88	-.86	1.20

Figure 5

Score Distribution Histogram for Depression Knowledge Posttest II



APPENDIX M

Cost Effectiveness Analysis Forms

Cost Effectiveness Analysis (Participant)

For the purposes of this questionnaire, please answer each question as if you had viewed the lecture through two-way video from your own home as opposed to here in the Deaf Center.

Please estimate your total travel cost savings if you had viewed the lecture from your own home through two-way video:

Please estimate the amount of travel time saved if you had viewed the lecture from your home through two-way video:

Would you recommend two-way video to a friend as a way to save money in seeking health care? Circle one: YES NO

If you circled "NO," please explain:

Cost Effectiveness Analysis (Lecturer)

For the purposes of this questionnaire, please answer each question as if you had administered the psychoeducational lecture(s) via two-way video from your own home as opposed to here in the Comprehensive Clinic.

Please estimate your total travel cost savings if you had given the psychoeducational lecture(s) from your own home via two-way video:

Please estimate the amount of travel time saved if you had administered the lecture(s) from your own home via two-way video:

Would you recommend two-way video as an effective cost saving way to deliver health care at a distance? Circle one: YES NO

If you circled "NO," please explain:

Cost Effectiveness Analysis (Societal)

Estimated cost(s) in purchasing equipment:

Equipment replacement costs (every three years):

Estimated costs of telehealth bridging and line charges:

Estimated costs of staff:

Other estimated costs:

APPENDIX N

Lecture Adherence Scale

Lecture Adherence Scale

Please indicate how closely you feel that you adhered to the psychoeducational transcript during the lecture.

Please use the following scale when rating your adherence:

1	2	3	4	5	6	7	8	9	10
I did <u>not</u> adhere to the transcript.				I adhered to the transcript about half of the time.			I adhered to the transcript completely.		

Please briefly indicate the reason for endorsing the number you circled on the scale above:

APPENDIX O

Interpreting Adherence Scale

Interpreting Adherence Scale

Please indicate how closely you feel that you adhered to the lecture while interpreting.

Please use the following scale when rating your adherence:

1	2	3	4	5	6	7	8	9	10
I did <u>not</u> adhere to the lecture.				I adhered to the lecture about half of the time.					I adhered to the lecture completely.

Please briefly indicate the reason for endorsing the number you circled on the scale above:

APPENDIX P

Research Study Agenda A (Telehealth) & B (Attention Placebo Control) For 12 o'clock

Sessions

Research Study Agenda
For Participants Starting in Lecture Hall
All Times Approximate

SATURDAY, JUNE 3RD 2006	
12 o'clock Session	
11:00 am to 12:00 pm	Register and be seated in Lecture Hall
12:00 pm to 1:00 pm	Sign Consent Form and Fill Out Demographics Sheet Take Pretest I Take BDI-II and BHS
1:00 pm to 1:20 pm	Telehealth Presentation
1:20 pm to 1:50 pm	Take Posttest I Fill Out Satisfaction Questionnaire and Cost Effectiveness Analysis
1:50 pm to 2:00 pm	Break (Get some refreshments!)
SWITCH TO CONFERENCE ROOM	
2:00 pm	Be seated in CONFERENCE ROOM
2:00 pm to 2:20 pm	Take Pretest II
2:20 pm to 2:40 pm	Read Printed Literature Presentation
2:40 pm to 3:10 pm	Take Posttest II Fill out Satisfaction Questionnaire
3:10 pm	Farewell – Thank you for coming today! ☺ Receive \$20
TRIPLE TEN BONUS REMEMBER TO COME BACK NEXT WEEK SATURDAY, JUNE 10 TH FOR 10 MINUTES TO RECEIVE \$10! COME TO THE DEAF CENTER ANYTIME BETWEEN 12 PM AND 8 PM	

Research Study Agenda
For Participants Starting in the Conference Room
All Times Approximate

SATURDAY, JUNE 3RD 2006	
12 O'CLOCK SESSION	
11:00 am to 12:00 pm	Register and be seated in the Conference Room
12:00 pm to 1:00 pm	Sign Consent Form and Fill Out Demographics Sheet Take Pretest I Take BDI-II and BHS
1:00 pm to 1:20 pm	Read Printed Literature Presentation
1:20 pm to 1:50 pm	Take Posttest I Fill Out Satisfaction Questionnaire
1:50 pm to 2:00 pm	Break (Get some refreshments!)
SWITCH TO LECTURE HALL	
2:00 pm	Be seated in Lecture Hall
2:00 pm to 2:20 pm	Take Pretest II
2:20 pm to 2:40 pm	Watch Telehealth Presentation
2:40 pm to 3:10 pm	Take Posttest II Fill out Satisfaction Questionnaire and Cost Effectiveness Analysis
3:10 pm	Farewell – Thank you for coming today! ☺ Receive \$20
TRIPLE TEN BONUS REMEMBER TO COME BACK NEXT WEEK SATURDAY, JUNE 10TH FOR 10 MINUTES TO RECEIVE \$10! COME TO THE DEAF CENTER ANYTIME BETWEEN 12 PM AND 8 PM	

APPENDIX R

Debriefing Form

**Post Study Debriefing
“Psychoeducational Dissemination Across Distance”**

Within the deaf population, an extreme mental health professional shortage exists that may be alleviated with videoconferencing technology – also known as telehealth. Moreover, much needed mental health education within the deaf population remains largely inaccessible. Researchers have forewarned that the deaf population may remain underserved if significant changes do not take place with current or traditional service delivery methods. The goal of this study is to evaluate the efficacy and effectiveness of telehealth in teaching psychoeducational objectives, with special emphasis given to its application to the deaf population.

The data gleaned from the questionnaires used in this study will be analyzed to provide information concerning whether or not telehealth is considered to be an effective means of providing and receiving health education or services at a distance. Cost effectiveness and satisfaction in the use of such technology will be analyzed and compared to more traditional modes of health care delivery (patient visits doctor). Limitations in the use of such technology within the deaf population will also be examined. The results of this study will help us to better determine whether an alternative and effective solution to health care accessibility exists, given the shortage of mental health or health professionals that can competently serve the deaf population.

Thank you for your participation in this study. Should any questions arise, do not hesitate to contact the principal investigator of this study, Jaime Wilson, at the following email address: peanutbutterface@tmail.com.

APPENDIX S

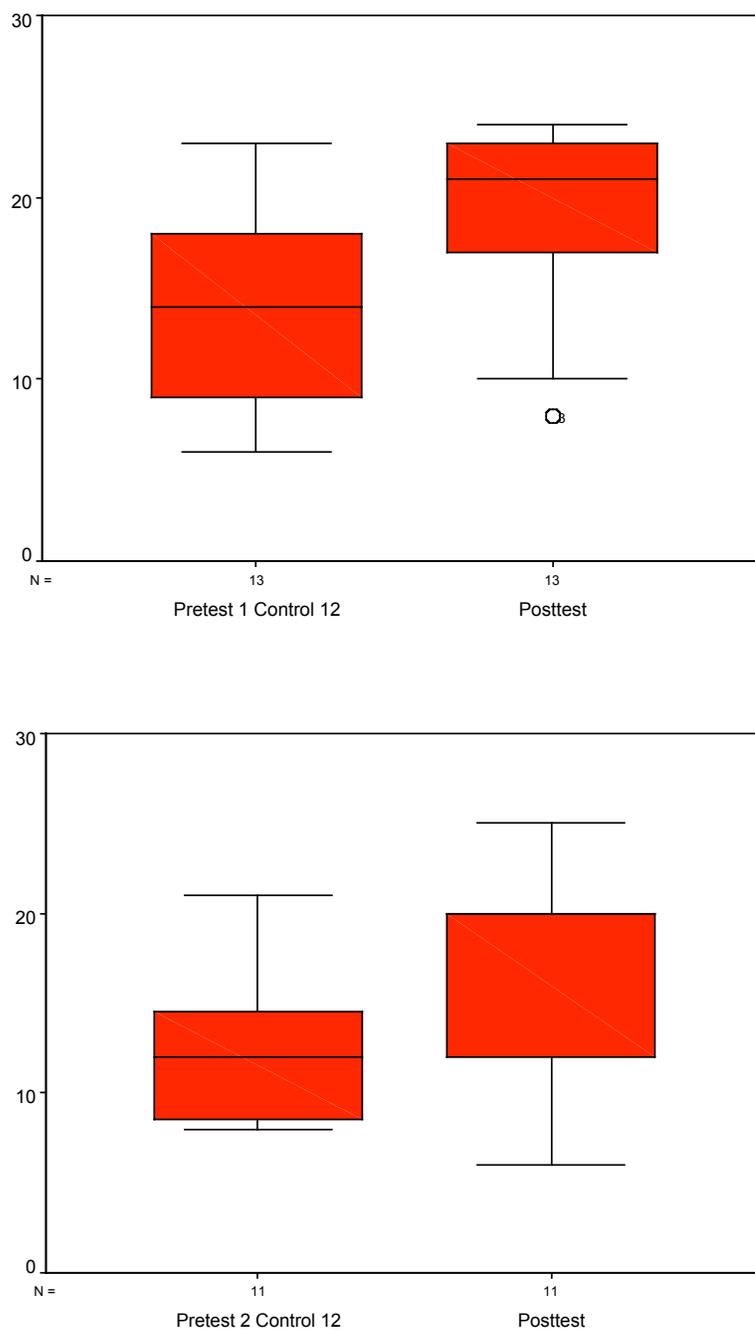
Boxplots for Telehealth and Attention Placebo Control Conditions Pretest and Posttest

Scores

Figure 7

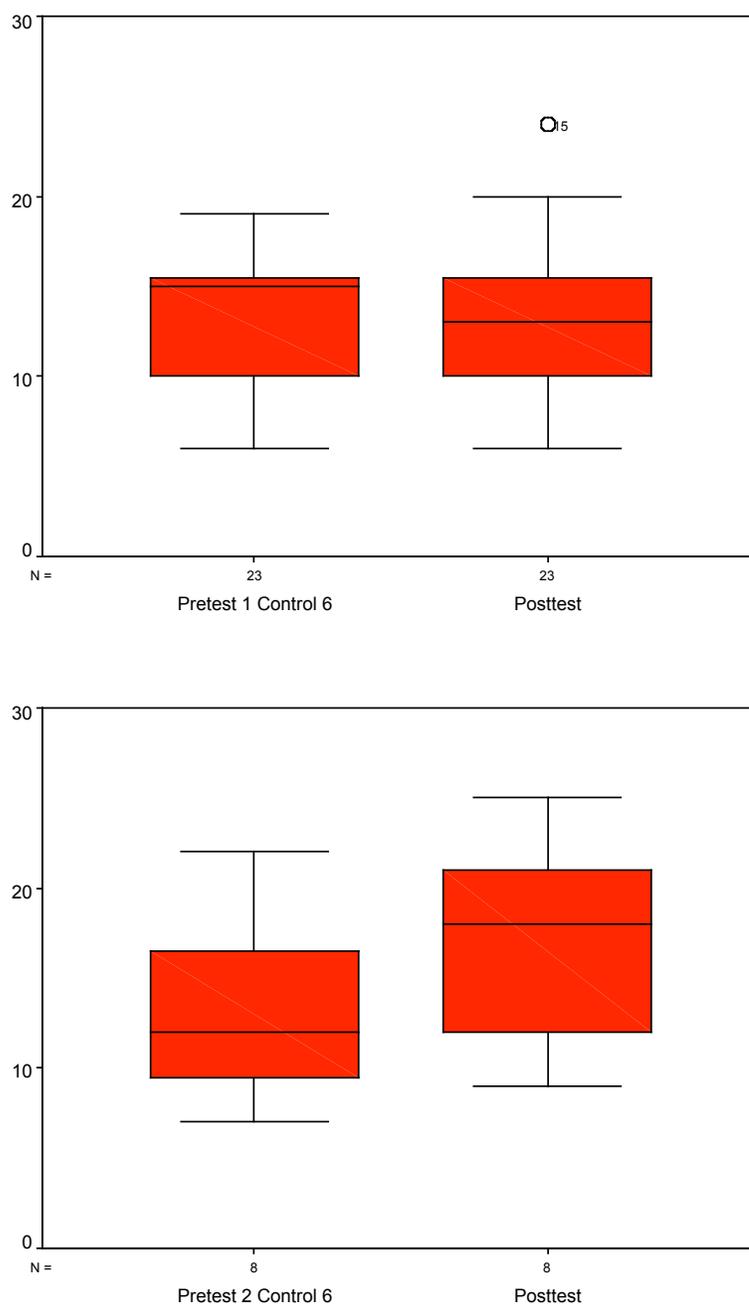
Boxplots for Telehealth and Attention Placebo Control Conditions on Depression

Knowledge Pretest and Posttest Scores



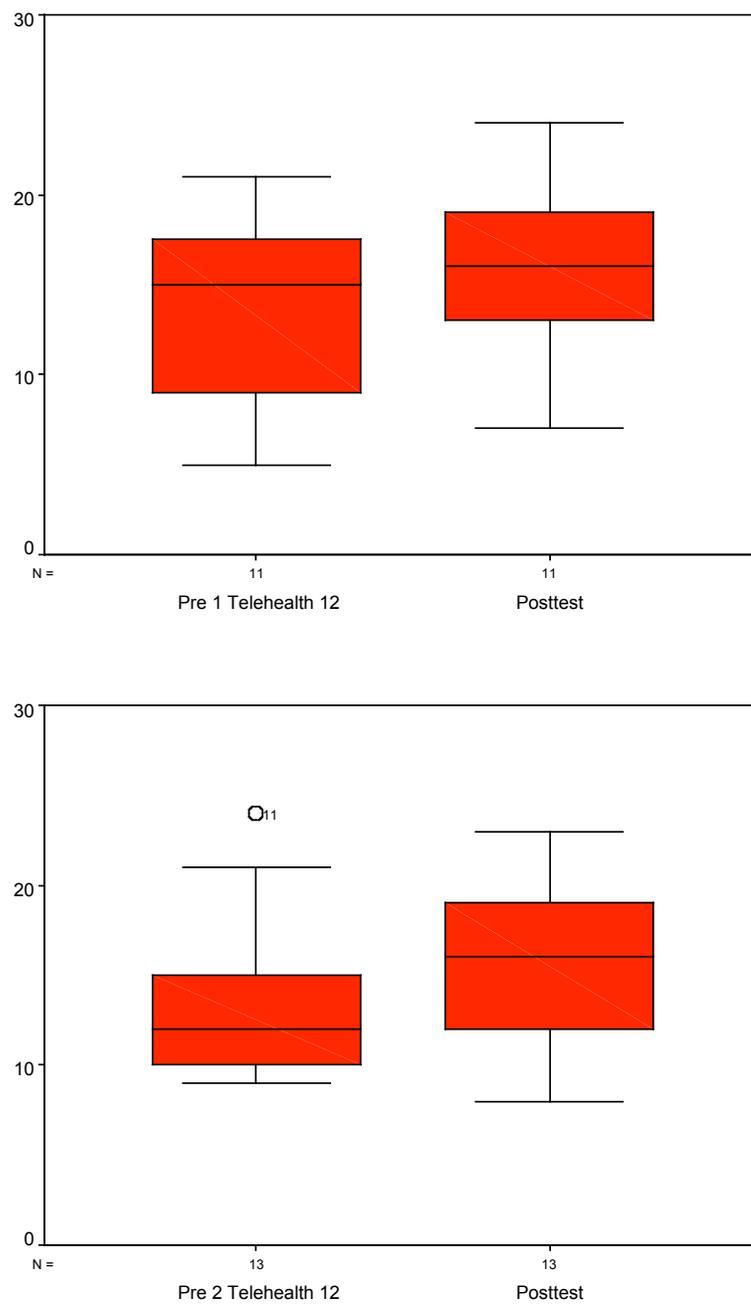
(Figure Continues)

Figure 7 (continued)



(Figure Continues)

Figure 7 (continued)



(Figure Continues)

Figure 7 (continued)

