

**School of Psychology and Speech Pathology
Faculty of Health Sciences**

**The Effectiveness of Videoconference-Based
Cognitive-Behavioural Therapy**

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Doctor of Philosophy
of
Curtin University**

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Thesis Declaration

To the best of my knowledge and belief this thesis contains no material previously published by another person except where due acknowledgement has been made.

This thesis contains no material that has been accepted for the award of any other degree or diploma in any university.

Signature:

Date:

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List of Abbreviations

| | |
|---------|--|
| AIHW | Australian Institute of Health and Welfare |
| ANOVA | Analysis of Variance |
| ASI-R | Anxiety Sensitivity Index Revised |
| BDI | Beck Depression Inventory |
| BFNE | Brief Fear of Negative Evaluation |
| CBT | Cognitive Behaviour Therapy |
| CONSORT | Consolidated Standards of Reporting Trials |
| CSQ | Client Satisfaction Questionnaire |
| CTQ | Credibility of Therapy Questionnaire |
| DASS | Depression, Anxiety and Stress Scale |
| DSM-IV | Diagnostic and Statistical Manual of Mental Disorder 4 th Ed. |
| F2F | Face-to-face |
| GAD | Generalised Anxiety Disorder |
| GLMM | Generalised Linear Mixed Models |
| HAQ | Health Anxiety Questionnaire |
| ISDN | Integrated Service Digital Networks |
| IES-R | Impact of Events Scale Revised |
| LDQ | Leeds Dependence Questionnaire |
| MLM | Multi-level Linear Modelling |
| NRHA | National Rural Health Alliance |
| OCD | Obsessive-Compulsive Disorder |
| OCI-R | Obsessive Compulsive Inventory Revised |
| PA | Panic Disorder/Agoraphobia |
| PSQ-R | Penn State Worry Questionnaire |
| PTSD | Post-Traumatic Stress Disorder |
| QLES-Q | Quality of Life Enjoyment and Satisfaction Questionnaire |
| RCT | Randomised Controlled Trial |
| SCID | Structured Clinical Interview for the <i>DSM-IV</i> |
| SPSS | Statistical Package for the Social Sciences |
| TSQ | Telemedicine Satisfaction Questionnaire |
| WAI | Working Alliance Inventory |

Abstract

The purpose of this research was to expand scientific understanding regarding the use of videoconferencing technology to administer psychological services. The primary study in this thesis is a randomised-controlled trial comparing in-person to videoconference-based Cognitive-Behavioural Therapy (CBT). This study is, to the author's knowledge, the largest clinical trial investigating the effectiveness of CBT via videoconference that has been conducted on an adult population in Australia. Twenty-nine clients were recruited who had a primary DSM-IV diagnosis of anxiety and/or depression. Participants were randomly assigned to receive 12 sessions of either in-person or videoconference-based treatment. Participants in both conditions received treatment at a university clinic in Perth Western Australia. The intervention provided was based on CBT manualised treatments but individualised to suit the unique needs of each client. Primary symptomology and quality of life was measured pre, post and 6-weeks following treatment. Secondary outcome measures included working alliance, credibility of therapy and client satisfaction. Overall, retention in both treatment conditions was similar. Statistical analysis using multi-level linear modelling indicated a significant reduction in client symptoms across time but no significant differences between treatment conditions. There were also no significant differences between conditions on working alliance, credibility of therapy and client satisfaction ratings. The findings of study one suggest that CBT via videoconference can be effectively provided in a real-world clinical practice context.

The second study in this thesis is an in-depth case study of a client with severe and complex obsessive-compulsive disorder who received forty sessions of psychotherapy administered through a mix of videoconference and text-chat. Session recordings, transcripts and therapists notes were analysed using thematic analysis to explore how the technology influenced client engagement. The results indicated that the mixture of videoconferencing and text-chat might have facilitated client engagement by helping to reduce interpersonal anxiety, thus allowing the client to continue disclosing and discussing issues that were espoused in shame, guilt and embarrassment. To the author's knowledge, the methods of engaging the client via combined videoconference and text-chat reported in study two have not been reported in the literature before.

It was concluded that CBT can be administered as effectively via videoconference as in-person with no significant difference in clinical outcomes, and the technology can enable new ways of engaging clients. On the basis of these findings it is recommended that videoconferencing services be used to provide CBT to clients who have limited access to psychological services.

Introduction And Overview

In Australia there is a disparity in access to psychological services between people who live in cities and those who live in rural and remote areas (Joshi et al., 2001). This disparity is believed to contribute to the high rates of mortality and morbidity observed in rural and remote Australia (Australian Institute of Health and Welfare [AIHW], 2006). Methods of addressing this inequality need to be provided in order to develop healthy sustainable rural and remote communities. There are two interlinked reasons for this disparity. The first reason is that there is a lack of specialised clinicians who reside in rural/remote Australia (National Rural Health Alliance [NRHA], 2004). The second reason pertains to the vast geographical distances that separate the cities and towns. For example, to travel from the furthest west point of Australia to the furthest east point is the equivalent of travelling from London to Moscow, or Los Angeles to New York. Furthermore, for many parts of Australia there is less than one person per square kilometre (Australian Bureau of Statistics [ABS], 2009). Consequently, even if there were more clinicians in rural and remote Australia, much of their time would be consumed with travelling between the various towns.

One way of addressing the disparity in access to services would be to use technology to provide remote communication between specialised health care professionals and rural and remote clients. This thesis focuses on the use of videoconferencing technology to provide remote psychological services. If psychological services, such as Cognitive Behavioural Therapy (CBT), can be administered via videoconference and result in clinical outcomes comparable to what is obtained in-person, then treatment via videoconference may be an appropriate method of reducing the disparity in access to services. The overarching aim of this thesis is to expand knowledge regarding the effectiveness of CBT via videoconference.

Scope of Thesis

Chapter one begins with an overview of CBT, which is an empirically supported psychological treatment for a variety of mental health conditions (Barlow, 2008). The key elements of CBT theory and the techniques that comprise its

application will be outlined. This will be followed by a brief discussion of the therapeutic alliance and interpersonal processes, as they are important to all forms of psychotherapy, including CBT. Other related issues covered are the distinction between efficacy and effectiveness-based clinical research, and the impact of psychotherapy on a client's quality of life. The remainder of chapter one explores the empirical support regarding the efficacy and effectiveness of CBT for a variety of psychological disorders.

Chapter two will provide a literature review regarding the field of telemental health with a specific focus on videoconferencing. Chapter two will begin by discussing the need for remote mental health services in rural and remote Australia and provide a definition of telemental health. This will be followed by a review of the forms of telemental health technology such as telephone, computer, virtual reality, text and videoconference. Of these, videoconferencing bears the closest resemblance to in-person encounters (Richardson et al., 2009) and thus appears to be the most suitable media for extending already existing in-person CBT research. The potential benefits, cost effectiveness and legal issues pertaining to the provision of mental health services via videoconference will be discussed before focusing on user satisfaction, the therapeutic alliance and diagnosis via videoconference. Mental health services via videoconference have been provided to individuals and groups, and a substantial amount of research has been conducted on specific disorder populations. This literature will be reviewed and the issues that have not yet been sufficiently addressed will be identified.

Chapters three and four provide the details of a randomised controlled trial (RCT) that compares the clinical outcomes of CBT obtained in-person to via videoconference. The focus of chapter three is the theoretical, methodological and statistical rationale for study one. In this chapter the aims, research questions and study hypotheses will also be provided. Chapter four presents the methods, results and a discussion of the findings that emanate from study one. Study one is to the author's knowledge the largest scientific investigation into the effectiveness of CBT via videoconference that has been conducted on an adult population in Australia. Furthermore, the participant groups was characterised by a variety of disorders and comorbid conditions. Consequently, study one has important implications for both the literature and practicing psychologists.

Despite the utility of the findings from study one, RCT designs are unable to explore the session-by-session experiences of the client and therapist. Hence, study two was conducted in order to provide greater depth to the research. Chapter five reports the details of study two, which involved an in-depth qualitative analysis of the session-by-session experiences for one participant treated via combined videoconference and text-chat. This case was chosen not because it is an ideal example of how to practice psychotherapy, but because it highlights some of the positives and negatives of conducting psychotherapy via digital media. Furthermore, this case study is of particular importance because there were several clinical techniques that were conducted via the technology that have, to the author's knowledge, not been reported in the literature before. Due to the unique experiences observed with this particular participant and the complexity of presenting issues, the length of treatment was extended from 12 weeks to approximately one year. This provided a unique opportunity to experiment with new clinical techniques as they arose during the course of therapy. Qualitative analysis was used to systematically investigate how the technology impacted client engagement. This case study expands on previous anecdotal evidence regarding the unique benefits of mental health treatment via digital media and provides direction for future research.

The last chapter in this thesis is a general discussion where the findings of the two studies are reviewed and discussed within the context of prior research. A discussion regarding the implications for clinical practice and the broader field of telemental health is provided. The barriers to the implementation of videoconferencing services are also discussed followed by several recommendations for future research.

Chapter 1: Cognitive-Behavioural Psychotherapy

Psychologists have a responsibility to provide a service to their clients that is supported by scientific evidence (Persons & Silberschatz, 1998). The most comprehensive form of clinical evidence is that provided by a RCT. Such trials involve randomly assigning participants to receive either Treatment A or Treatment B, which can take the form of a wait-list control group, placebo condition or an already established effective treatment (Chambless & Hollon, 1998). The purpose of a RCT involving a waitlist control condition is to determine if an intervention is more effective than no treatment. This needs to be established because it is possible for some client symptoms to remit in the absence of treatment (Page & Stritzke, 2006). By comparing a treatment group to a waitlist control group spontaneous recovery can be ruled out. The purpose of conducting a RCT involving a placebo condition is to determine if the specific ingredients of an intervention results in better clinical outcomes than a treatment that the client believes is beneficial but does not actually contain the specific treatment ingredients (Persons & Silberchatz, 1998). Once a treatment has been shown to be effective at reducing symptoms above and beyond both a waitlist and a placebo it can then be considered an empirically supported treatment. Following this, RCT's can then be conducted comparing an already empirically supported treatment to newer forms of treatment (Moher, Schulz, & Altman, 2001). The purpose of such trials is to determine if the new treatment results in better, worse or equal outcomes to that of already empirically supported treatments.

Although it has been estimated that there are approximately 400 different types of psychotherapy in existence (Garfield, 1998), not all treatment approaches are supported by strong evidence. The treatment approach that has received the most empirical and clinical support via the implementation of rigorous RCT's is CBT (Page & Stritzke, 2006). CBT can be used to treat a variety of different psychological disorders (Barlow, 2009). In this chapter a brief overview of CBT theory and techniques will be provided as well as a brief overview of several disorders and the relevant research attesting to the efficacy and effectiveness of CBT for those disorders.

1.1 General Theory of CBT

As the name implies, CBT is an amalgamation of two paradigms for understanding psychological disorders; cognitive and behavioural. Cognitive therapy developed out of the early work by Beck (1963; 1964) who posited that cognition has a central influence on psychosocial and emotional functioning. According to cognitive theory psychological disorders arise not from events but from the meanings and appraisals that the person gives those events. The meaning that a person ascribes to an event or experience is largely shaped by a person's core beliefs about themselves, others and the world in general. These core beliefs are believed to have developed as a result of biological, developmental and experiential factors (Barlow, 2008). The practice of cognitive therapy involves active, directive, time-limited and structured therapy (Beck, Rush, Shaw, & Emery, 1979). The purpose of cognitive therapy is to help clients identify and reality-test unhelpful cognitions and to help them develop and test new more adaptive cognitions (Bennett-Levy et al., 2004b). Although cognitive therapy has been demonstrated as an effective form of treatment for several mental health problems including depression and anxiety (Beck et al., 1979; Clark, 1986), it has been most widely used and integrated with behaviour therapy (Bennett-Levy et al., 2004a).

Behaviour theory, and consequently behaviour therapy, largely emanated from the work of Skinner (1938; 1979) and emphasised that people acquire adaptive or maladaptive behaviours through a process of learning and schedules of reinforcement (Austad, 2009). Thus by extension, according to behavioural theory psychological disorders result from this learning process and consequently they can be unlearned through these same mechanisms. For example, a fear of spiders can be reinforced and maintained by a person's avoidance of spiders. Therefore in order to address this issue the individual needs to break this cycle of avoidance to reduce the fear associated with spiders. However, it can be difficult to get clients to engage in exposure without addressing the cognitions underlying their fears (Barlow, 2008). Hence, behaviour therapy for the treatment of mood disorders is most often used in conjunction with cognitive therapy (Mazzucchelli, 2010).

Behavioural experiments in the context of cognitive therapy are often used to help the client test out their beliefs about a situation (Mazzucchelli, 2010). For example, consider a depressed client that states 'I fail at everything I do so there is no point in trying'. One way of addressing this is by using cognitive therapy techniques,

such as helping the client to identify and challenge the assertion that they fail at *everything* and that not *all* tasks are pass/fail. This same issue can also be addressed using behavioural experiments as homework activities between sessions, such as attempting activities to break the cycle of avoidance regarding tasks. However, the cognitive and behavioural elements of treatment are not completely independent of one another. For example, helping and encouraging the client to attempt activities in order to break the cycle of avoidance can in turn be used to challenge the original cognition by providing evidence against the assertion that failure is a certainty and that there is no additional benefit to engaging in tasks irrespective of the outcome. Hence, the theory underpinning CBT is an amalgamation of both cognitive and behavioural theory. However, it should be noted that although cognitive therapy, behaviour therapy and cognitive-behavioural therapy were originally separate therapies, most modern research approaches consider them as part of the spectrum of cognitive-behavioural psychotherapies (Cormier & Nurius, 2003). Therefore the term CBT will be used throughout unless the research being reviewed involves a direct comparison between different forms of CBT. A brief overview of some of the core CBT techniques will now be provided.

1.2 Core Techniques of CBT

There are a variety of clinical principles and techniques that comprise the practice of CBT. Two of the guiding principles of CBT are collaboration and guided empiricism (Young, Rygh, Weinberger, & Beck, 2008). Collaboration in the context of CBT is the process of working with the client on what is most important to them as well as developing goals for therapy and for each session. Guided empiricism involves working with the client in a scientific manner regarding their cognitions and behaviours, which involves the process of investigation, the development of hypotheses and then behaving in new ways to test out these hypotheses. This process of collaboration and guided empiricism is used to help the client develop a formulation and understanding of how his/her problems are maintained. The development of a formulation is an integral part of a CBT intervention because it guides the identification of cognitions and behaviours to be addressed in therapy (Beck et al., 1979).

Several techniques are involved in the application of CBT, one of which is psychoeducation. Psychoeducation is the process of educating the client about the

causes of their problems and how their problems are maintained (Craske & Barlow, 2008). Furthermore, psychoeducation involves helping the client distinguish between thoughts and feelings, different types of thoughts (automatic vs. core beliefs) and how to engaging in self-monitoring exercises (Cormier & Nurius, 2003). Following psychoeducation, cognitive restructuring can begin, which involves identifying unhelpful thinking patterns and then using cognitive disputations to address them (Cormier & Nurius, 2003). The disputation process involves helping the client develop cognitions that are accurate and based in reality.

There are also several behavioural techniques that are used during CBT, such as exposure, relaxation, problem solving and behavioural activation (Cormier & Nurius, 2003). There are various types of exposure activities such as systematic desensitisation, graded exposure, interoceptive exposure and imaginal exposure (Barlow, 2008). However, in general each of these methods has the same core principle. The point of exposure is to help the client break the cycle of avoidance and habituate to the stimuli. By engaging in exposure the link between the trigger (for example interacting with others) and the unpleasant emotion (anxiety) will decrease as a result of the exposure. Relaxation is another core technique and is often employed in the treatment of generalised anxiety disorder (Barlow, 2008). Relaxation is used to help control the somatic symptoms of anxiety, which if used frequently can result in a general reduction of anxiety. Problem solving is a process that can be used to help clients develop alternative solutions to issues in their lives and empower them to make new decisions for themselves (Cormier & Nurius, 2003). Behavioural activation can be used in the treatment of depression and involves developing a schedule of activities for the client to engage in and can be used to stop the avoidance of pleasurable activities (Page & Stritzke, 2006). Although these techniques form the basis of CBT, other elements essential to the practice of CBT include the therapeutic alliance and interpersonal processes.

1.3 Therapeutic/Working Alliance

The therapeutic alliance (also known as the working relationship or working alliance) is not a concept that directly emanates from CBT theory, however it is a necessary element of effective CBT practice (Beck et al., 1979). There is however, much contention as how to best define the therapeutic alliance. According to Gaston (1990) the therapeutic alliance is defined as the degree to which the client and

therapist agree on shared goals, collaborate on tasks aimed at therapeutic change and can develop a positive relationship. Whereas Hatcher and Barends (2006) define the therapeutic alliance as “the degree to which the therapy dyad is engaged in collaborative, purposive work” (p.293). Nevertheless, it is generally accepted that the relationship between client and therapist should be characterised by warmth, genuineness and positive regard (Cormier & Nurius, 2003). This relationship between client and therapist is important in the context of CBT practice because it is a primary factor that determines treatment outcomes. A consistent finding throughout the literature is that the better the therapeutic alliance the better the treatment outcomes are likely to be (Wampold, 2001). The therapeutic alliance also has an impact on the interpersonal processes that take place during psychotherapy (Teyber, 2006).

1.4 Interpersonal Processes In Therapy

There are a variety of interpersonal process that are not directly linked to CBT theory but have an influence on the client-therapist interaction and in turn the practice of psychotherapy. These include, but not limited to, transference, counter-transference and interpersonal coping strategies (Teyber & McClure, 2011). Transference is the process by which clients’ distort their perceptions of their therapist (as well as others in their lives) in a way that reflects their early childhood experiences with their primary caregivers (Freud, 1925-1926/1961). When negative transference is high there is a greater chance of a poor therapeutic alliance and in turn poor treatment outcomes (Marmarosh, Gelso, Markin, & Majors, 2009). Counter-transference is a similar construct to transference but is from the frame of reference of the therapist. Although transference related issues are important to address, they are not the only interpersonal issues that practicing CBT therapists need to take into account.

People often develop relatively inflexible interpersonal coping strategies to deal with their unmet developmental attachment needs (Teyber, 2006; Teyber & McClure, 2011). The interpersonal coping styles that people develop inevitably find their way into the therapeutic dynamic and are a facet of human interaction that needs to be addressed in the context of psychotherapy. When early developmental needs for attachment have not been sufficiently met, it is common for the ensuing adult to develop inflexible interpersonal coping strategies to deal with the early childhood attachment issues (Teyber, 2006). The CBT therapist needs to be mindful of these interpersonal issues and help clients overcome them by applying the cognitive and

behavioural techniques discussed above in the context of the therapeutic encounter (Cormier & Nurius, 2003).

1.5 Efficacy vs. Effectiveness in Clinical Research

Across the field of clinical research there is a distinction between efficacy-based research and effectiveness-based research (Nathan, Stuart, & Dolan, 2000). Efficacy-based research is primarily focused on measuring specific intervention effects under controlled conditions, thus having a high degree of internal validity. In order to measure specific effects the researcher aims to control factors that might obscure accurate measurement of participant change, such as making participants blind to the experimental manipulation (Nathan et al., 2000). Efficacy studies also employ random assignment to condition and use restrictive inclusion and exclusion criteria so that a homogeneous group of participants can be studied. Despite the important role that efficacy-based studies play in the development of empirical evidence, such studies have been criticised, and thus often rejected, by practicing clinicians on the basis that they are not relevant to real-world practitioners (Persons & Silberschats, 1998; Shafran et al., 2009).

In contrast, effectiveness-based studies aim to examine if a treatment is feasible, measurable across broad populations, and effective in real-world settings (Barlow, 1996). Effectiveness studies are generally influenced by the constraints of the real-world settings and therefore internal validity may be compromised but external validity is generally higher (Nathan et al., 2000). However, although these two categories of research are distinct from one another, it is possible to have a mixture of these approaches. Such designs have become more frequently utilised in recent years (Shafran et al., 2009) because they encompass several of the benefits from each methodology. Another area of research that is clinically relevant in relation to the effectiveness of CBT pertains to changes in a client's quality of life as a result of treatment.

1.6 End State Functioning and Quality of Life

Changes in clinical symptoms can be independent of changes in a client's end state functioning (Craske et al., 2007). For example, a client's disorder specific symptoms may reduce as a result of treatment but their overall end state functioning might not have improved. In order to gain a broader understanding of the impact that

a particular intervention has on a client it is important to measure both his/her clinical symptoms and their end state functioning. One way of measuring a client's end state functioning is to measure their quality of life.

People with mental health difficulties have been shown to have a poorer quality of life than those without (Lehman, 1983). Unfortunately though, there is no consensus regarding an operational definition of quality of life and there is ongoing debate as to the utility of subjective measures of quality of life (Gladis, Gosh, Dishuk, & Crits-Christoph, 1999). Furthermore, the exact relationship between clinical symptoms and quality of life outcomes is currently unclear (Gladis et al., 1999). Consequently, methods of measuring quality of life have varied considerably between studies. Evidence exists indicating that CBT can be used to improve quality of life in chronic conditions such as schizophrenia (Bechdolf et al., 2010) but there are a limited amount of studies specifically addressing emotion related disorders.

Telch, Schmidt, Jaimez, Jacquin, and Harrington (1995) examined the changes in quality of life in 156 participants with panic disorder by randomly allocating them to either 12 weeks of group CBT or a waitlist control group. The results indicated that quality of life for the participants in the CBT condition significantly improved from pre to post treatment, as did their disorder related symptoms. In a similar study Diefenbach, Abramowitz, and Norberg (2007) investigated changes in quality of life associated with CBT treatment for Obsessive-Compulsive Disorder (OCD). This study involved 70 participants treated in an outpatient facility over the course of 15 weekly sessions. The findings of this research also indicated that CBT resulted in a significant reduction in clinical symptoms and a significant increase in quality of life. Despite the limited array of research specifically addressing emotion related disorders and quality of life, the evidence thus far suggests that CBT can be effective in improving quality of life.

1.7 DSM-IV Clinical Conditions Relevant To Thesis

The American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders 4th Edition Text Revision (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association, 2000) provides the diagnostic criteria for numerous psychiatric disorders. Therefore the literature review below is limited to mental health conditions that were encountered in the participants that took part in this research. Section 1.7 will begin by discussing relevant Axis-I conditions.

1.7.1 Depressive Disorders

Major depressive disorder (depression) is one of the most common mental health disorders (Young et al., 2008) and it is estimated that approximately 20.8% of people are likely to suffer from it during their lifetime (Kessler et al., 2005). Furthermore, in the United States depression is the major leading cause of disability for people aged between 15-44 and the cost associated with it has been estimated to be more than \$30 billion per year (NIMH, 2006). Typical symptoms of depression include apathy, persistent feelings of sadness, insomnia, feelings of worthlessness, attention difficulties and recurrent thoughts of death and even suicide (*DSM-IV-TR*, 2000). One of the most well researched psychotherapy treatments for depression is CBT (Garcia-Lizana & Munoz-Mayorga, 2010).

Several meta-analyses have been conducted in relation to depression. In a meta-analysis involving 132 studies and 10,134 participants Driessen, Cuijpers, Hollon, and Dekker (2010) reported that CBT was superior to control conditions, with an effect size ranging from $d = 0.4$ to 0.88 . Driessen et al. (2010) found that pre-treatment severity did not moderate the efficacy of treatment outcome. Similar findings have also been observed in a meta-analysis specifically focusing on behavioural activation treatment for depression. Mazzucchelli (2010) reported that the pooled effect size (Hedges's g) from pre to post-treatment for participants meeting the criteria for depression was 0.82 . It was noted by Mazzucchelli that no significant differences in clinical outcomes were observed between behavioural activation and cognitive therapy treatments. Cuijpers et al. (2010) conducted a meta-analysis specifically pertaining to chronic depression and found that pharmacotherapy was significantly more effective than CBT ($d = -.31$). Cuijpers et al. (2010) did however observe a small but significant effect for CBT with chronically depressed participants ($d = .23$). Cuijpers, Cignnet, Meijel, Straten, and Anderson (2011) meta-analysis on CBT for depression administered in an in-patient setting revealed a small significant effect ($g = .29$). However, only 12 studies were included in the analysis and there were methodological flaws with several of the studies. Collectively these meta-analyses suggest that CBT is an efficacious treatment for depression.

Further research has been conducted in order to establish the effectiveness CBT for depression in real-world settings. Merrill, Tolbert, and Wade (2003) reported the details of a study specifically addressing the effectiveness of CBT in a community

mental health centre setting. They aimed to determine if CBT for depression would be feasible to administer in such a setting and if similar outcomes to prior efficacy-based RCT could be obtained. Although the study included 192 participants, there was no control condition, which makes it difficult to rule out other factors that may have contributed to the change in symptoms. Nevertheless, Merrill et al. (2003) reported that the outcomes were not significantly different from those obtained in prior efficacy-based research. However, better outcomes were observed for participants without a comorbid personality disorder. Persons, Bostrom, and Bertagnolli (1999) investigated the effectiveness of CBT administered in a private practice setting compared to a RCT setting. They noted that in the private practice setting there were higher rates of psychiatric and medical comorbid problems, a greater range of severity in depressive symptoms and the treatments were delivered in a more flexible manner using individualised formulations. Person et al. (1999) observed a significant reduction in symptoms from pre to post treatment in the private practice condition and no significant differences with efficacy-based research findings. Together the above research indicates that CBT for depression is both efficacious and effective therefore it should be considered as a gold standard evidence-based treatment for depression.

1.7.2 Anxiety Disorders

1.7.2.1 Obsessive-Compulsive Disorder

It has been estimated that between 1-3% of the population have OCD (Kessler et al., 2005) and that it is unlikely to remit without intervention (Barlow, 2008). Typical symptoms of OCD include obsessions regarding thoughts and impulses that are typically of an inappropriate nature coupled with compulsions to relieve the anxiety associated with the obsessions, such as repetitive acts and/or mental rituals (*DSM-IV-TR*, 2000). The compulsions relieve the anxiety because the individual with OCD believes that the acts prevent feared obsessions from eventuating.

Two empirically supported treatments for OCD are cognitive therapy (Abramowitz, Franklin, & Foa, 2002) and a form of behaviour therapy called Exposure Response Prevention (ERP) (Rosa-Alcazar, Sanchez-Meca, Gomez-Conesa, & Marin-Matinez, 2008). ERP involves exposing clients to the stimuli that triggers the anxiety associated with the obsessions and resisting the compulsion typically used to relieve the anxiety, which through graded exposure eventually leads to a reduction in symptoms (Rees, 2009). The efficacy of ERP has been demonstrated in several

meta-analyses (Abramowitz, 1996; 1997; Kobak, Greist, Jefferson, Katzelnick, & Henk, 1998; Rosa-Alcazar et al., 2008) and most studies have observed a large effect size ($d = .98$ to 1.5). In a study examining the change scores as a result of treatment outcomes, Fisher and Wells (2005) found that 50-60% of participants were likely to be classified as recovered as a result of ERP and therefore ERP is regarded as the treatment of choice for OCD. Rosa-Alcazar et al. (2008) investigated the differences in efficacy between cognitive therapy, ERP and combined cognitive therapy and ERP via a comprehensive meta-analysis. They identified 19 studies conducted over a 26-year period and the results revealed large effect sizes for both ERP ($d = 1.13$) and cognitive therapy ($d = 1.09$). Although the effect size for the combined treatment was also large ($d = .99$), it was smaller than either therapy in isolation. Despite the lack of evidence supporting the superiority of combined treatment (CBT) over cognitive therapy and ERP in isolation, the finding reported by Rosa-Alcazar et al., (2008) indicate that CBT is an empirically validated form of treatment for OCD.

Many of the studies investigating CBT for OCD have been criticised on the basis that the findings are not relevant to real-world client groups because the samples used excluded participants with comorbid disorders (Persons & Silberschatz, 1998). Hence, Franklin, Abramowitz, Kozak, Levitt, and Foa (2000) aimed to extend previous research findings by administering ERP in a community outpatient service to 110 participants suffering from OCD. In this study participants were not excluded because of comorbid issues, treatment history, concomitant pharmacotherapy, age or symptom severity, and were charged for sessions. Treatment occurred over the course of 18 weekly two-hour sessions. The results indicated that the average reduction in symptoms was not significantly different from what had been obtained in prior RCT trials. Furthermore, 86% of participants were identified as having made a clinically significant reduction in symptoms from pre to post treatment. These findings suggest that empirically supported CBT treatment for OCD can be provided in real-world settings.

1.7.2.2 Generalised Anxiety Disorder

Generalised Anxiety Disorder (GAD) has been estimated to occur in approximately 3.8% of the population (Robins & Regier, 1991). Typical symptoms include excessive anxiety and worry that occur in relation to a variety of different triggers, an inability to control the worry and somatic symptoms such as restlessness,

difficulty concentrating, irritability, muscle tension and sleep disturbances (*DSM-IV-TR*, 2000). Unfortunately, GAD was not listed as a specific diagnosis in the DSM until the third edition; consequently much of the research into the condition has focused on establishing the efficacy of treatment rather than effectiveness (Borkovec, Michelle, Newman, Pincus, & Lytle, 2002). Furthermore, ongoing research is still being conducted to determine the exact relationship between GAD and other disorders, such as social phobia and depression, and which form of CBT is best suited to the specific needs of clients with GAD (Roemer, Orsillo, & Barlow, 2006). For example, CBT related treatments currently emerging include worry exposure, integrating interpersonal therapy to CBT, targeting intolerance of uncertainty, addressing meta-worry as well as the integration of mindfulness approaches (Roemer et al., 2006). Therefore, this brief review of efficacy-based research for GAD will primarily focus on studies that implemented the general CBT theoretical framework.

Several studies have examined if CBT can be used to successfully reduce the symptoms of GAD. Butler, Fennel, Robson, and Gelder (1991) randomly assigned 57 participants to either CBT, behaviour therapy or to a waitlist control group. The results indicated that although both treatments resulted in significantly better outcomes than the waitlist control group, the outcomes in the CBT group were significantly higher than in the behavioural therapy group. The amount of treatment the participants in this study received ranged from 4-12 sessions, thus reducing the internal validity of the study. Building on the initial findings of Butler et al. (1991) indicating that CBT can be efficacious for GAD, Ost and Breitholtz (2000) compared applied relaxation (a behavioural intervention) and cognitive therapy for the treatment of GAD involving a standard 12 sessions conducted in an outpatient facility. The results of their research indicated significant symptom reduction in both conditions and these gains were maintained at one-year follow-up. Furthermore, 56% of participants in the cognitive therapy condition were classified as meeting the criteria for clinically significant change at follow-up.

Although previous CBT-based research has indicated both efficacy and effectiveness (Butler et al., 1991; Ost & Breitholtz, 2000), clinical understanding of GAD has continued to evolve and thus further research has been conducted implementing some of these newer elements. For example, Ladoucer et al., (2000) investigated the effects of CBT for the treatment of GAD that encompassed a specific focus on intolerance of uncertainty, erroneous beliefs about worry, poor problem

orientation and cognitive avoidance. The 26 participants included in the study were randomly allocated to the treatment condition or a delayed treatment control condition. Like prior research (Ost & Breitholtz, 2000) the results indicated that the intervention resulted in a significant reduction in symptoms that was maintained at one-year follow-up. However, in this study it was reported that 77% of participants no longer met the DSM-IV criteria for GAD, which was higher than prior research.

In a meta-analysis of treatments for GAD, Mitte (2005a) concluded on the basis of 65 studies that both CBT and pharmacotherapy are effective in reducing symptoms of GAD. However, the attrition rates were lower for CBT than for pharmacotherapy, suggesting that the participants found CBT a more acceptable form of treatment. Together, the above lines of research indicate that CBT treatments can be efficacious in reducing symptoms of GAD.

1.7.2.3 Hypochondriasis

The main symptom of hypochondriasis is a persistent fear that one has a serious disease or illness despite medical evaluation and reassurance indicating otherwise (*DSM-IV-TR*, 2000). Hypochondriasis is believed to occur in 1-5% of the general population (*DSM-IV-TR*, 2000). Although comprehensive guides for treating health anxiety using CBT principles are currently available (see Taylor & Asmundson, 2004), there are relatively few RCTs investigating the efficacy of CBT for hypochondriasis.

The first RCT trial using a CBT intervention for hypochondriasis was conducted by Barsky and Ahern (2004). Over the course of four years Barsky and Ahern (2004) recruited 102 participants and assigned them to either six sessions of CBT or medical care as usual. Their results indicated that the reduction in symptoms from pre to post-treatment was significantly better in the CBT condition than in the usual care condition and these gains were maintained at 12-months follow-up. However, since their study began several advancements have been made in the understanding of CBT treatment for hypochondriasis (Fava et al., 2000; Visser & Bouman; Salkovskis et al., 2003), therefore the treatment used in the research by Barsky and Ahern (2004) may not be the best form of CBT for hypochondriasis. In a more recent study Sorensen, Birket-Smith, Watter, Buemann, and Salkovskis (2011) reported the details of a RCT comparing a modern CBT approach for the treatment of hypochondriasis to a short-term psychodynamic psychotherapy and a waitlist control

group. The findings of this study indicated that CBT resulted in a significantly higher reduction in symptoms than both the waitlist control group and the psychodynamic treatment group. However, there were several methodological problems that weaken the validity of these findings. For example, the CBT intervention involved six individual sessions followed by several group CBT sessions and several mindfulness-based sessions, all of which were considered to be part of the same overall CBT treatment. The problem with this is that it is unclear what effects CBT had specifically versus the group elements and the mindfulness elements. Furthermore, the 'CBT' treatment was administered by six CBT therapists whereas the psychodynamic therapy was provided by only one psychiatrist. Thus the results obtained in the psychodynamic condition may better reflect the competency of the clinician rather than the competency of psychodynamic therapy in general. Although there is limited research the literature thus far suggests that CBT can be used to successfully treat hypochondriasis.

1.7.2.3 Social Phobia

Social phobia, also known as social anxiety disorder, is the most common type of anxiety disorder (Hofman & Barlow, 2006) and has been estimated to occur in 13.3% of the population (Kessler et al., 1994). The central feature of the disorder is a persistent fear of social or performance situations where the individual perceives that they will be exposed to unfamiliar people, be exposed to scrutiny by others and/or their physical signs of anxiety, such as blushing, will be observable by others and thus embarrassing (*DSM-IV-TR*, 2000). Although these central features exist, there is considerable variability in how the disorder manifests (Hofman & Barlow, 2006). For example, some clients may fear a specific activity, such as signing a bank cheque or urinating in a crowded public toilet, whereas other clients may present with a general fear pertaining to most social situations.

Several psychological treatments exist for social phobia (Hofmann & Barlow, 2006), however one of the most strongly validated treatments is CBT. Given that social phobia pertains to fears regarding others it is logical to assume that group therapy would be the most beneficial form of treatment for the condition. Stangier, Heidenreich, Peitz, Lauterbach, and Clark (2003) conducted a RCT comparing CBT in a group-based format to an individual format. Using the treatment guidelines provided by Clark and Wells (1995), 71 participants were included in the study and

the results from pre to post treatment indicated that both conditions resulted in a significant reduction in primary symptoms and this was maintained at six-month follow-up. Evidence also exists indicating that cognitive therapy is more beneficial than other treatments. Clark et al., (2006) randomly assigned 62 participants to receive cognitive therapy, exposure plus applied relaxation or allocation to a waitlist control condition. Although both treatment conditions resulted in a significantly higher reduction in symptoms than the waitlist control group; 42% of participants in the exposure plus applied relaxation group no longer met the criteria for social phobia at post-treatment whereas 84% of participants in the cognitive therapy condition no longer met the diagnostic criteria. Furthermore, these differences were maintained at one-year follow-up. This finding suggests that cognitive therapy may be slightly more effective than exposure plus applied relaxation but both were effective.

In addition to evidence supporting the efficacy of CBT treatments for social phobia, evidence also exists supporting the effectiveness of CBT. Lincoln et al. (2003) reported the use of CBT by 57 therapists to treat 217 participants for social phobia in four separate outpatient clinics. The results indicated a significant reduction in symptoms and these gains were maintained six weeks following treatment. Thus it appears that CBT for social phobia can be successfully implemented in real-world settings. In a more recent study on group CBT for social phobia McEvoy, Nathan, Rapee, and Campbell (2012) compared the treatment outcomes obtained in a research setting to a real world clinical setting. The results indicated a significant reduction in symptoms from pre to post-treatment in both conditions but no significant differences between the research and real-world clinics were identified.

Support for the superiority of CBT over both cognitive therapy and behavioural therapy in isolation is also evident in the literature. Taylor (1996) conducted a meta-analysis of 42 treatment outcome trials for social phobia and compared the outcomes for waitlist control, placebo, exposure, cognitive therapy, and cognitive therapy plus both exposure and social skills training. Although all treatment interventions, including the placebo condition, resulted in better outcomes than the waitlist control group, cognitive therapy plus exposure (CBT) was the only intervention that resulted in significantly larger effect sizes than the placebo group. Thus in light of the above literature, CBT for social phobia appears to be the most efficacious psychological treatment currently available and can be applied to real-world settings.

1.7.2.4 Panic Disorder and Agoraphobia

Panic disorder is a condition in which the individual experiences recurrent unexpected panic attacks and it can be accompanied by anxiety about the believed consequences of the panic attacks and/or anxiety about having additional panic attacks (*DSM-IV-TR*, 2000). Agoraphobia refers to a fear of being in a place that escape may be difficult or there may be no help available thus situations are either avoided or endured with great distress (*DSM-IV-TR*, 2000). A consensus has not been reached regarding the relationship between panic disorder and agoraphobia (White & Barlow, 2006); therefore although panic and agoraphobia can occur independently of one another, for ease of discussion they will be discussed together and referred to as panic/agoraphobia (PA). Estimates of PA in the general population range from 3.5% to 5.3% (Kessler et al., 1994), which indicates that it is one of the most common anxiety disorders.

CBT has received considerable empirical validation for the treatment of PA. Mitte (2005b) conducted a meta-analysis comparing CBT to pharmacotherapy on the basis of 124 studies. The results of this research indicated that CBT was more effective than both a waitlist control condition and a placebo control condition. Furthermore, CBT was found to be as effective as pharmacotherapy but there were no observed benefits of combined CBT and pharmacotherapy over CBT in isolation. This meta-analysis provides the strongest evidence of the efficacy of CBT for PA, however further evidence is needed to determine if such findings extend to real-world populations.

Building on the previous research, Stuart, Treat, and Wade (2000) conducted a study to determine if CBT for PA could be extended to real-world population. Their research included 81 participants with PA who completed a standard course of CBT in a community mental health centre. The outcome data for this treatment group were compared to the results obtained in prior efficacy-based studies. The results of their research did not indicate any significant differences between their real-world treatment group and the findings obtained in prior research. It was reported that 89% of the participants in the community mental health centre were panic free at one-year follow-up. In a more recent study Addis et al. (2006) reported the details of 80 participants in a managed care setting with PA who were randomly assigned to receive either 12-15 sessions of CBT or treatment as usual, which was described as

whatever treatment the participant's psychiatrist deemed appropriate. The CBT intervention resulted in higher rates of symptom reduction than those in the treatment as usual condition; 55% of the participants in the CBT condition were classified as having reached the criteria for clinically significant change at 2-years follow-up whereas only 8.3% had reached clinical significance at follow-up in the treatment as usual condition. However, this difference should be interpreted with caution because 90% of those in the treatment as usual condition dropped out of the study making it unclear what the rates of symptom reduction would have been if the participants had stayed in treatment. When considering the above research pertaining to CBT for PA the literature supports the assertion that it is an empirically validated treatment of PA.

1.7.2.5 Post Traumatic Stress Disorder

Another common anxiety disorder is post-traumatic stress disorder (PTSD). Typical symptoms of PTSD include recurrent and intrusive recollections and/or dreams of the traumatic events, a subjective feeling of reliving the traumatic moment, and intense distress in response to internal and/or external cues related to the traumatic event (*DSM-IV-TR*, 2000). Common behavioural symptoms include persistent avoidance of thoughts, feelings, activities and/or conversations pertaining to the trauma, inability to recall aspects of the trauma and restricted affect. Further symptoms include difficulty sleeping, emotional outbursts, difficulty concentrating and hyper-vigilance. It has been observed that the incidence of PTSD differs for different population groups. For example, PTSD has been found to occur in 7.8% of the general population (Kessler, 1994) whereas for Vietnam combat veterans the rates of PTSD have been estimated as ranging from 15-30% and in response to natural disasters the rates of PTSD have been reported to be as high as 44% (Keane & Barlow, 2006). Given the substantial number of people who have PTSD, CBT interventions tailored to the needs of clients presenting with such symptoms have been developed (Resick, Monson, & Rizvi, 2008).

The efficacy of CBT for PTSD has been explored in a number of studies. Bisson et al. (2007) conducted a meta-analysis on all of the randomised controlled trials that had been conducted to date. Thirty-eight studies were included in the analysis, which encompassed several different treatment settings and interventions. The results indicated that CBT is one of the most efficacious treatments for PTSD and

is superior to stress management (standard mean difference of $-.27$) and supportive therapy ($-.81$).

Research has also been conducted indicating the effectiveness of CBT for PTSD in real world settings. Neuner, Schauer, Klaschik, Karunakara, and Elbert (2004) investigated PTSD in 43 Sudanese refugees living in a Uganda settlement. Participants were randomly assigned to receive either four sessions of either CBT or supportive counselling, or one session of psychoeducation. The results of this study indicated that only 29% of participants in the CBT condition still met the criteria for PTSD one year following treatment whereas 79% of the supportive counselling group and 80% of the psychoeducation group still met the criteria. The effectiveness of CBT for PTSD has also been explored with female assault survivors. Foa et al. (2005) randomly assigned 171 participants to receive either prolonged exposure therapy, prolonged exposure therapy plus cognitive restructuring or allocation to a waitlist control group. The findings of this study indicated that both treatments were superior to the waitlist control condition and that these gains were maintained at follow-up, thus suggesting a general CBT approach to treatment in real-world settings can be effective. Overall the above research indicates that CBT is both an efficacious and effective form of treatment for PTSD.

1.7.2.6 Mixed Diagnosis Groups

As the literature review indicates, CBT is an empirically validated treatment for a variety of different disorders. However, not all clients in real world practices present with clinical issues that can be easily classified into specific diagnostic criteria (McEvoy & Nathan, 2007). Furthermore, transdiagnostic CBT treatments are being developed for clusters of clinical conditions, such as eating disorders (Fairburn, Cooper, Shafran, & Wilson, 2008), and therefore it is worth reviewing some of the literature pertaining to CBT and the treatment of mixed diagnosis. Westbrook and Kirk (2005) explored the outcome data for several hundred participants treated with CBT in the British National Health Service and included all conditions seen at the clinics and found that after treatment two thirds recovered to within the normal symptom range for their presenting disorder. This finding attests to the overall effectiveness of CBT in clinical practice.

Some lines of research have also argued that there are commonalities across treatments for emotional disorders, such as neuroticism (Andrews, 1996) and

affective schemas (Leahy, 2010). Therefore it might be possible to develop unified treatment interventions that can be used to target a range of disorders (McEvoy & Nathan, 2007). Clinical approaches that aim to address several disorders in a single intervention are referred to as transdiagnostic treatments (Barlow, Allen, & Choate, 2004). Meta-analysis research of transdiagnostic CBT treatments for emotional disorders have found that clinical outcomes are not significantly different from traditional disorder-specific treatments (Norton & Price, 2007) and they are efficacious (McEvoy, Nathan & Norton, 2009). Stewart and Chambless (2009) conducted a meta-analysis of 56 effectiveness-based CBT studies for the treatment of anxiety disorders. Stewart and Chambless (2009) found that the effect sizes obtained throughout the literature were comparable to what had been observed in the efficacy-based trials.

The above literature supports the use of CBT as an effective form of treatment for emotional disorders. However, in many real-world populations clients present with a variety of personality disorders (also referred to as DSM-IV Axis-II diagnoses) that also need to be considered in relation to the implementation of CBT practices.

1.7.3 Axis II Clinical Conditions

Personality disorders refer to enduring inflexible and maladaptive patterns of interaction with others and perceiving others that is exhibited in a wide variety of contexts (*DSM-IV-TR*, 2000). Personality disorders have been categorised in the *DSM-IV-TR* (2000) into three clusters. Cluster A includes paranoid, schizoid and schizotypal, which are characterised by odd or eccentric behaviours. Cluster B includes antisocial, borderline, histrionic and narcissistic, which are characterised by dramatic emotional and/or erratic behaviours. Cluster C includes avoidant, dependent and obsessive-compulsive, which are characterised by anxious and/or fearful behaviours. Empirically validated treatments have been devised for most personality disorders (Beck & Freeman, 1990) however, attention will be focused on avoidant personality disorder (APD) and/or obsessive-compulsive personality disorder (OCPD) because many of the participants included in the research associated with this thesis presented with these conditions.

1.7.3.1 Avoidant Personality Disorder

Although it has been estimated that less than 1% of people suffer with avoidant personality disorder (Zimmerman & Coryell, 1990) the exact figures are not known because the symptoms of the condition overlap with those of social phobia (Barlow & Durand, 2005). Symptoms include the avoidance of activities associated with interpersonal contact, fear of being rejected, interpersonal emotional restraint and viewing the self as inept, unappealing and/or inferior (*DSM-IV-TR*, 2000). In one of the few studies that have specifically examined APD, Alden (1989) recruited 76 participants that met the diagnostic criteria and randomly assigned them to a 10-week group program involving either graded exposure, interpersonal skills training, an intimacy focus condition, or a waitlist control group. The findings of this study indicated that although all of the participants in all three treatment-groups were observed to have significantly improved symptoms from pre to post treatment, none were functioning at the level of a normative comparison group at the end of treatment. In more recent research Emmelkamp et al. (2006) compared both CBT and brief dynamic therapy for the treatment of APD to a waitlist control condition. Sixty-two participants were included in the study and were randomly assigned to either treatment, both of which lasted for 20 weekly sessions. The findings indicated that CBT resulted in significantly better outcomes than both the brief dynamic therapy condition and the waitlist control condition. Thus, although there is limited research pertaining to brief CBT for APD (Barlow & Durand, 2005), the research conducted thus far indicates that it can be successful in reducing the symptoms of APD but this reduction may not necessarily be to the level of 'normal' functioning.

1.7.3.2 Obsessive-Compulsive Personality Disorder

One of the most common personality disorders is OCPD, which has been estimated to occur in approximately 4% of the general population (Weissman, 1993). Some of the core features of this disorder include a pervasive preoccupation with details, rules and lists that interfere with task completion, perfectionism, excessive devotion to productivity at the exclusion of leisure and friendships, and an inflexible sense of morals and values (*DSM-IV-TR*, 2000). Other commonly encountered symptoms include hoarding behaviours and extreme stubbornness. There is little information on the specific treatment outcomes using CBT methods to address OCPD (McCullough & Maltsberg, 2001). However, perfectionism is a core symptom of

OCPD and can be treated using CBT (Shafran, Egan, & Wade, 2010). In a recent literature review on perfectionism (Egan, Wade, & Shafran, 2011) CBT was reported to be an efficacious treatment.

OCPD has also been investigated within the context of OCD (Pinto, Liebowitz, Edna, & Blair, 2011). Pinto et al. (2011) examined if the presence of OCPD in participants with OCD resulted in poorer treatment outcomes when using exposure response prevention than those without the comorbid disorder. The study included 49 participants and 34.7% of those met the criteria for both disorders. The results indicated that the presence of comorbid OCPD significantly reduces the likelihood of successful treatment outcomes and that the greater the severity of the OCPD the poorer the outcome. These findings indicate that the presence of OCPD in the context of OCD should be considered when administering CBT for clients with OCD. Based on the limited studies available, the literature indicates that CBT could be effective for the treatment of OCPD but further research is needed to draw stronger conclusions regarding its efficacy with this population.

1.8 Chapter Summary

This chapter has provided a brief overview of CBT theory and some of the key studies supporting its use in clinical practice. The practice of CBT involves helping clients to challenge their irrational thinking and change the behaviours implicated in the maintenance of their condition. Other factors integral to the successful implementation of CBT also need to be considered in the context of clinical practice, such as the therapeutic alliance and interpersonal processes. With regards to clinical research pertaining to the practice of CBT, some studies focus on the efficacy of treatment for a particular disorder whereas others focus on the effectiveness, or real-world applicability, of a given intervention. CBT has received empirical support attesting to both its efficacy and effectiveness with a variety of clinical conditions (Butler, Chapman, Forman, & Beck, 2006). It is also necessary to note that the range of disorders reviewed in this chapter is not an exhaustive list because it is limited to conditions relevant to study one. For the purposes of exploring if clinical psychology services can be effectively provided via digital media, the literature indicates that CBT is an ideal form of therapy to use for such an investigation.

Chapter 2: Telemental Health

To begin this chapter a discussion regarding the need for mental health services in rural and remote Australia will be provided, which will be followed by a discussion regarding telemental health technology and specifically videoconferencing.

2.1 The Need For Remote Mental Health Services

According to the Australian Bureau of Statistics ([ABS] 2012a; 2012b), 31.2% of Australia's population (7.1million people) live in non-metropolitan areas. Current estimates regarding the prevalence of psychological disorders during a 12-month period indicate that approximately one in four people are likely to meet the criteria for a disorder (Kessler, Chiu, Demler, & Walters, 2005). Thus approximately 1.7million people outside metropolitan centres in Australia will be in need of psychological services for either management or treatment of a psychological disturbance at any given time. Based on a 2003 survey there are around 2000 psychologists working in rural or remote Australia (NRHA, 2004), which given the above statistics equates to approximately 850 potential clients per psychologist. These service demands are impossible for any psychologist to meet considering that the average full-time metropolitan psychologist sees approximately 20-25 clients a week using therapeutic interventions that typically require 10-20 sessions (Barlow, 2008).

Although the above statistics indicate that there is approximately one psychologist per 850 people, this is a gross underestimation because these statistics are based on the rate of psychological distress observed in capital cities. Rural and remote populations have higher rates of accidents, suicide and exposure to violence (AIHW, 2006) as well as increased rates of risk factors known to play a role in the emergence of psychological dysfunction, including poor physical health, obesity, smoking, drug abuse, high blood pressure and poor nutrition (NRHA, 2004). As a result non-indigenous people living in rural and remote Australia experience a rate of mortality and morbidity that is far greater than their metropolitan counterparts (AIHW, 2003). As for the indigenous population in rural and remote communities, the state of affairs is considerably worse whereby the rates of mortality and morbidity are approximately 2-4 times higher than for non-indigenous Australians (Pink & Allbon, 2008).

Due to the lack of skilled specialised professionals working in rural and remote Australia and the higher rates of psychological dysfunction, an issue of quality versus accessibility has arisen. People in rural and remote Australia are in the highest need of specialised mental health services however, due to the lack of specialised clinicians working in these areas the accessibility of those services frequently range from little to none (NRHA, 2004). Consequently rural and remote mental health services can be forced to employ generic mental health practitioners, who can be from a diverse array of clinical backgrounds, such as occupational therapy, social work or psychiatric nursing (Roufeil, Battye, & Lipzker, 2007). Such services are typically beyond the scope of their initial training and designated area of expertise.

The issue of accessibility is complicated not just by the lack of qualified specialist clinicians but also by the vast geographical distance between clients. Most rural communities in Australia are thousands of kilometres from specialised care and in some parts there is less than one person per square kilometre (ABS, 2012b) hence there is often no help of any kind for a substantial distance. It is also important to consider that the need for remote psychological services is not limited to rural areas. A clinician specialised in an intervention, such as CBT, or a particular client group, is likely to be in demand across all geographies, across both rural areas and metropolitan centres. This high demand is likely to put substantial strain on the experienced clinician who may have to spend considerable time travelling amongst both local and rural locations to meet the needs of both clients and less experienced clinicians wanting professional guidance. It is also worth considering that increasing efficient access to experienced CBT clinicians irrespective of location may help to increase the dissemination of empirically validated treatments (Safran et al., 2009).

In order to meet client demands across vast areas outreach services have been provided. One of the earliest forms of outreach health services was provided by horseback. Dodd (1930) reports the details of a doctor in the mountains of Lebanon who visited clients in remote communities on horseback. This kind of intervention requires the clinician to live as a nomad moving from village to village meeting the needs for each community as they arise. In more recent times services have been provided via automobiles and aeroplanes. Centacare in Western Australia is an organisation that provides outreach mental health services to remote communities. Clinicians are located in rural towns such as Exmouth, Carnarvon, Kalbari and Yalgoo (www.centacaregeralton.org.au) and from these locations clinicians can use

automobiles to service nearby adjacent smaller locations. The difficulty with these services is that the clinicians have access to a limited amount of professional support and are not necessarily trained in specialised CBT treatments. The Royal Flying Doctor Service (www.flyingdoctor.net) is a service that transports medical health professionals on aeroplanes so that they can provide outreach health services in-person, but such services are not an efficient use of resources for providing weekly one-hour mental health treatment sessions.

Travelling to clients, whether it is by horse, car or plane, is an inefficient means of service delivery because the time it takes to reach clients is often so great that the clinician would not be able to treat much more than one client a day, if any. For psychological interventions, travelling is particularly impractical because most treatments require weekly consultations. Furthermore, travelling to the required destination is often a costly venture, for either the client or the clinician, depending on who does the travel and pays for the accommodation (Shore et al., 2007). One potential method of addressing the above issues is by providing mental health services via telehealth.

2.2 Defining Telehealth

Telehealth is a broad umbrella term that refers to a wide variety of services ranging from medical to mental health. Nickleson (1998) defines 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). For the purposes of this thesis the exploration of telehealth will be focused on the implementation of mental health services via telehealth, hence the term telemental health will be used. The term telemental health helps to clarify the field under investigation (Grady et al., 2011) because it differentiates it from the broader field of telehealth, which applies to a wide range of professions not necessarily relevant to this thesis. Telemental health services have been provided by psychiatrists (telepsychiatry), psychologists (telepsychology), nurses, physicians, social workers, counsellors and primary care providers (Grady et al., 2011). The main aim of these services is to use technology to increase the availability and accessibility of quality, evidence-based, specialised practice for people who cannot receive, or have limited access to, in-person services. There are a

variety of different technologies through which telemental health services can be provided, each of which will be discussed below.

2.3 Forms of Telemental Health

2.3.1 Telephone Therapy

Although Alexander Graham Bell invented the telephone in 1876 and the first report of the telephone being used for telemedicine was reported in 1879 (Mohr, Vella, Hart, Heckman, & Simon, 2008), it was not until 1949 that the telephone was reported to have been used for mental health services (Berger & Glueck, 1949). Initial reports in the literature (Lindon, 1988; MacKinnon & Micheles, 1970) suggested that diagnosis and treatment could be successfully administered via the telephone. Until the mid-90's the empirical evidence regarding telephone-based psychotherapy was extremely limited (Hass, Benedict, & Kobos, 1996). However, as empirically based treatments began emerging in the in-person literature, a greater number of RCT's also emerged in the telephone-based therapy literature (Mohr et al., 2008).

Psychotherapy via telephone has been demonstrated to be effective for a wide range of disorders. Examples in the literature of RCT designs involving CBT include alcohol/cocaine dependence (McKay, Lynch, Shepard, & Pettinati, 2005), panic disorder with agoraphobia (1995), a non-inferiority trial for OCD (Taylor et al., 2007) and bulimic disorders (Palmer, Birchall, McGrain, & Sullivan, 2002). Other forms of therapy have also been reported in the literature such as the use of increased social support to treat Schizophrenia (Beebe, 2001), interpersonal psychotherapy for HIV-infected rural clients with depression (Ransom et al., 2008), psychoanalysis (Bassen, 2007) and telephone management for outpatients starting antidepressant medication (Simon, Ludman, & Operskalski, 2006), all of which reported successful outcomes in comparison to in-person services.

In the context of mental health services the telephone has also been used as an adjunct to other media. For example, Carlbring et al. (2007) administered an Internet-based CBT intervention for social phobia with additional telephone support and compared the results with a waitlist control group. A significant reduction in social anxiety was reported and these gains were maintained at one-year follow-up. Palmer, Birchall, McGrain, and Sullivan (2002) reported the use of a book-based self-help treatment for bulimic disorders that was coupled with either additional in-person guidance or telephone-based guidance and also found no significant differences

between conditions. Although the findings from individual studies can be informative, stronger conclusions can be made on the basis of meta-analytic studies.

When examining the literature on telephone-based psychotherapy the most conclusive evidence comes from meta-analytic studies (Mohr et al., 2008; Muller & Yardley, 2011). Mohr et al. (2008) conducted a meta-analysis to investigate the effects of telephone-based psychotherapy for depression in comparison to control conditions. Ten studies were included in the analysis and the control condition varied between studies ranging from a waitlist control, comparison to a similar treatment, to treatment as usual. The analysis included 601 participants in the in-person condition and 714 in the telephone-based condition and a small significant effect size ($d = 0.26$) was identified. However, Mohr et al. (2008) argue that this small effect size occurred because the comparison was most against treatment as usual, which often involved psychiatric intervention. Thus, when analysing just the pre-post treatment data for the telephone condition the effect size was large ($d = 0.81$). In a meta-analysis specifically focusing on CBT via telephone for physical health problems Muller and Yardley (2011) found similar results. Eight RCT's were included in the analysis totalling 1093 participants. Again a small yet significant effect size was reported ($d = 0.23$). Furthermore, Muller and Yardley (2011) noted that less therapist contact was associated with better outcomes and CBT had poorer outcomes in cases of immediate life-threatening illnesses. Although these studies indicate that telephone-based psychotherapy can be more effective than a variety of control conditions, further research is needed to determine how much the outcomes of interventions administered via telephone differ from outcomes of in-person interventions administered within the same population and study parameters. However, even if further research is conducted, treatment via telephone may not be able to overcome some of the disadvantages of communication via telephone.

The main feature that communication via the telephone lacks is non-verbal interpersonal interaction. It has been estimated that approximately only 7% of emotional interpersonal communication happens through the verbal channel (Mehrabrian, 1972). The rest of emotional communication occurs through the non-verbal channels. The observation and interpretation of non-verbal behaviour allows a clinician to obtain a wide range of data from the client about their emotional functioning and reactions to the clinical interaction (Teyber, 2006). For example, when a clinician can see his/her client they can interpret the client's facial emotions,

eye gaze, and nervous behaviours, such as twitching or fiddling with objects. Consequently many clinicians may not find telephone-based interactions to be an acceptable form of treatment delivery for the way they practice psychotherapy. Hence some clinicians may opt to use other forms of technology to provide clinical services to remote clients.

2.3.2 Computer-Aided Psychotherapy

Computer-aided psychotherapy is another form of telemental health that allows the clinician to provide psychological services over distances. Computer-aided psychotherapy refers to any computing system used to provide an adjunct to clinician based diagnosis and/or treatment of psychological conditions (Marks, Shaw, & Parkin, 1998) and generally comes in two formats: peripheral and central (Marks, Cavanagh, & Gega, 2007). Peripheral systems involve the use of CD-ROM's (compact-disk read-only memory), DVD's (digital-video disk) or downloadable programs from the Internet that operate solely on a standalone computer. In contrast, central systems involve the use of a remote computer that is linked to other computers (typically the client's personal computer) via the Internet with clients accessing the remote computer system. Initial research into computer-aided psychotherapy was conducted on peripheral systems but as the Internet became more widely used centralised systems began to be used in greater numbers (Marks et al., 2007). Peripheral systems are more likely to have problems with installation and hardware compatibility issues that clients are unlikely to be able to fix themselves whereas for centralised systems a remote technician can address the problems.

The most frequently researched psychological disorders treated via computer-aided systems have been phobic/panic disorders and eating disorders (Marks et al., 2007). Research has indicated that treatment for phobic/panic disorders can be effective through a variety of different media such as on a standalone computer (Shaw, Marks, & Toole, 1999) and on the Internet (Carlbring et al., 2007). Palmtop computers have also been used to aid between-session homework activities (Kenardy et al., 2003). Reger and Gahm (2009) conducted a meta-analysis of 19 RCT's comparing computer aided CBT for anxiety to a waitlist condition. The findings indicated that the intervention was superior to a waitlist control group and that the Cohen's *d* ranged from .49 to 1.14 across studies. This finding suggests that Internet computer aided psychotherapy can be effective in reducing symptoms of anxiety.

Cheng and Dizon (2012) systematically reviewed the literature pertaining to computerised CBT for insomnia and included four RCT's in their meta-analysis. Their analysis indicated that the treatment conditions resulted in significantly better outcomes than the control conditions with effect sizes ranging from $d = .41$ - $.55$.

Recent research has begun to investigate the effectiveness of web-based CBT in real-world clinical practice. Ruwaard, Lange, Schrieken, Dolan and Emmelkamp (2012) reported the details of a pre-post (5-16-week treatment), 6-week and 1-year follow-up uncontrolled study involving 1500 adults who presented with symptoms including depression, panic disorder, post-traumatic stress disorder or burnout. Large effect sizes were observed across a variety of global symptom measures ranging from $d = 1.2 - 1.9$ and these gains were maintained at 1-year follow-up. Together the above findings indicate that computer/web-based CBT can be effective in reducing the symptoms of some mental health conditions.

The literature regarding computer-aided treatments for eating disorders has been less favourable (Marks et al., 2007). Computer-aided psychotherapy for eating disorders has been conducted on devices such as wristwatches for symptom monitoring (LeGrange, Gorin, Dymek, & Stone, 2002), desktop units employing health information programs (Andrews et al., 1996) and via the Internet (Winzelberg et al., 1998). However, many of the studies involved adjacent in-person services and/or telephone-based periodic clinician contact, hence the degree to which outcomes can be attributed to clinician contact or computer-based interaction is unclear (Marks et al., 2007). Although the effect sizes for symptom reduction due to computer-aided psychotherapy in general range from small to large, it remains unclear as to which clients will benefit and to what degree (see Marks et al., 2007 for a full review). Marks et al. (2007) concluded that the use of adjunct computer-aided psychotherapy can result in a 50% reduction in therapist time and it seems to either help clients not need therapy or need less therapy. Nevertheless, computer-aided psychotherapy at this stage of research development does not appear to be an optimal digital media for bridging the gap between service providers and remote clients.

2.3.3 Virtual Reality For Mental Health Issues

Virtual reality technology is another form of digital media that can be used to help provide psychological services to remote client groups. Riva and Gamberini (2000) assert that “virtual reality is an application that lets users navigate and interact

with a three-dimensional computer-generated environment in real time” (p.327). Virtual reality can be conducted on a variety of different systems ranging from 3-dimension software installed on a personal computer to immersive headsets connected to a hand control (Hoffman, Doctor, Patterson, Carrougher, & Furness, 2000). A particular advantage of virtual reality systems is that they have the potential to offer accurate standardization and replication of a prescribed environment (Rizzo et al., 2000). For example, if one aimed to measure a client’s distractibility the clinician would be able, through the use of virtual reality, to create an environment where the degree of distraction could be accurately manipulated in a standardised and measurable way. Rizzo et al. (2000) assert that this would be extremely useful for developing improved methods of assessing attention in clients who present with Attention-Deficit Disorder or Traumatic Brain Injury.

Virtual reality has also been used to treat a variety of presenting psychological disorders and medical conditions. The most readily researched conditions in the virtual reality literature have pertained to phobias, such as fear of heights (Rothbaum et al., 1995), fear of flying (Rothbaum, Hodges, Watson, Kessler, & Opdykem, 1996), fear of spiders (Carlin, Hoffman, & Weghorst, 1997), claustrophobia (Botella et al., 1998), public speaking (Harris, Kemmerling, & North, 2002), general social phobia (Klinger et al., 2005) and fear of driving (Walshe, Lewis, Kim, O’Sullivan & Wiederhold, 2003). In most of these contexts the virtual reality technology has been used to provide exposure to stimuli unavailable in the clinical setting. Researchers have also used virtual reality to simulate events that occur in the real world. Han Lee et al. (2003) used virtual reality technology to expose nicotine addicts to the cues that typically trigger their desire to smoke, with the purpose of reducing their conditioned response to the stimuli. In other contexts virtual reality has been used to recreate environments that are similar to what a person has experienced in the past. Rothbaum et al. (1999) used virtual reality to help clients with PTSD come to terms with their war related trauma by increasing exposure and thus decreasing cognitive and emotional avoidance. Although phobia-based research features prominently in the virtual reality literature, the potential of this technology is not limited to phobias and exposure tasks.

Several lines of research have reported the use of immersive virtual reality systems to treat mental health related conditions. Immersive virtual reality systems have the potential to facilitate distraction away from the real world, which may be

extremely helpful for some clients. Schneider and Workman (1999) used virtual reality as a distracter for children receiving painful chemotherapy treatment. Hoffman et al. (2002) reported the use of virtual reality to treat two adolescents with severe burns who were provided with an immersive environment to interact with as opposed to a 2D videogame. Participants could pick up objects and move them around in the 3D world and reported significantly less pain than in the videogame control condition (Hoffman et al., 2000). Another example of the use of immersive virtual reality systems has been provided by Riva, Bacchetta, Cesa, Conti, and Molinari (2001) who used the technology as an adjunct to CBT for eating disorders by helping participants develop healthier perspectives of their body image via their virtual representations. Yet another use for virtual reality is provided by Glantz, Durlach, Barnett, and Aviles (1996) who discuss the possibility that virtual reality could be used to create social environments that aim to address interactions and/or resolve conflicts with others, such as parents or past abusers, that cannot be resolved in real-life. However, although these lines of research show considerable promise for future development, the technology is not devoid of limitations.

There are several issues that inhibit the wide spread use of the technology in clinical practice. Firstly, many of these new technologies have not been fully developed and tested clinically. This issue is further compounded by the fact that the quality of the technology improves at such a fast rate that once a system does show efficacy it is likely to be out-dated. Also, most clinicians lack the in-depth knowledge of computer programming needed to construct virtual reality environments that are tailored to the client's needs. Furthermore, Riva and Gamberini (2000) note that there are also potential negatives to the use of the technology, such as motion sickness, eye strain, decreased use of limbs, reduced presence and potentially the acquisition of responses that may be inappropriate for the real world. Consequently, further research is needed to determine exactly under what conditions virtual reality is going to be most useful and for which clients. These findings indicate that virtual reality may not be the most suitable solution for increasing remote client access to psychological services. Another method of connecting remote clients to mental health services is through text-based therapy.

2.3.4 Text-Based Therapy

Text-based therapy can be divided into asynchronous interaction via e-mail and synchronous (real-time) text interaction via the Internet. Although text-based therapy occurs via a computer, it is a different form of interaction than computer-aided psychotherapy. Computer-aided psychotherapy involves the use of a computer program as the means of providing psychotherapy whereas text-based psychotherapy, whether that is via e-mail or real-time chat, involves the use of a clinician as the means of providing therapy. Murphy and Mitchell (1998) use the term ‘therap-e-mail’, which refers to the practice of mental health therapy via e-mail. Treatment can occur solely via e-mail (Vernmark et al., 2000) or the technology can be used as an adjunct to a variety of forms of clinician contact such as in-person (Yager, 2000) or via telephone (Hilty, Ingraham, Yang, & Anders, 2004). There is also a variety of ways therap-e-mail can be used with clients.

In one of the early reports in the literature pertaining to therap-e-mail Yager (2000) described the use of e-mail contact with four participants with eating disorders and the ways the technology was used. With the first participant, e-mail was used to enhance contact between weekly sessions. With the second it was used as a treatment-monitoring system for ‘checking in’ between intermittent in-person contact. For the third participant e-mail was used as a way of monitoring daily food intake. For the fourth participant it was used to help them maintain clinical contact while they transitioned to a different health care provider. In addition to the variety of different ways therap-e-mail can be used there may also be some unique clinical benefits.

Some lines of anecdotal evidence exist indicating that therap-e-mail may be more useful to some clients than in-person interactions. For example, Yager (2000) asserts that a benefit of e-mail based interaction is that the client can write and communicate when they feel most inspired and/or need the contact the most. This may be beneficial for some clients because it can help them address issues at critical moments rather than having to spend time in session addressing thoughts and feelings in retrospect. Murphy and Mitchell (1998) also assert that in their experience with therap-e-mail it helps clients to externalise their problems because they have to physically write it down, which in turn enables them to address their problems more objectively. This may be particularly useful for helping clients gain clarity regarding the content of their thoughts. However, further research is needed to determine

whether these unique benefits result in significant improvements over in-person interactions.

In the largest and most comprehensive study involving therap-e-mail Vernmark et al. (2010) conducted a RCT for major depressive disorder. The study involved 88 participants that were randomised into either a waitlist control group, guided self-help via the Internet or individualised therap-e-mail. The outcome measures used were the Beck Depression Inventory (BDI); (Beck, Steer, & Brown, 1996), the Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988) and the Quality of Life Inventory (Frisch et al., 1992). The results indicated that both treatments were significantly more beneficial than the wait-list control group and there were no significant differences between the two alternative forms of therapy on the outcome measures. These findings suggest that therap-e-mail can be as effective as an empirically validated self-help treatment. However, further research is needed to determine how clinical outcomes via this media compare to in-person treatments.

As was noted earlier, another form of text-based therapy is text-chat. Text-chat occurs via a computer and the Internet just like therap-e-mail, however with text-chat the interaction occurs in real-time (synchronous) (Mallen, Vogel, & Rochlen, 2005). There are several advantages that have been discussed in the literature pertaining to therapy via text-chat. Like therap-e-mail, one of the most useful aspects of text-chat is that there is a permanent record of what is communicated. Both the client and therapist can look over the written content in the moment and potentially after the session (Murphy & Mitchell, 1998; Pollock, 2006). Re-reading the written content in the moment may be useful for facilitating memory of what was said whereas re-reading the content after the session may help aid critical reflection of what transpired. A further element noted in the literature pertaining to text-based therapy is that people appear to communicate in a more open and authentic manner than what is observed during in-person interactions (Walthger, 1996). However, until further research is conducted in this area it remains unclear if the reported benefits result in significantly greater improvements than in-person treatments.

Another issue pertaining to text-based therapy that is both a strength and a limitation is that there is an increased ethical responsibility to say the 'right thing' (Murphy & Mitchell, 1998). For example, during in-person interactions a clinician might say something that they soon regret whereas when communicating via text the clinician will have to think through what they are going to communicate to a greater

extent because they have to both type and read what they are writing, particularly via e-mail. Consequently, the clinician is less likely to make inappropriate comments (Murphy & Mitchell, 1998). Although a reduced likelihood of making inappropriate comments via text-based interaction is a good thing, Murphy and Mitchell (1998) note that this may cause clinicians to become overly controlled in what they say because they are trying to make sure they say the 'right' thing and limit their comments to statements that they would be comfortable defending in a court of law. Limits placed on communication such as this may impede the development of rapport and genuineness. However, no research has been conducted to investigate this issue.

Despite the potential advantages, therapy via text-chat is not devoid of limitations. Like the interaction via the telephone, one of the biggest challenges when working online via text is the lack of non-verbal cues (Colon, 1996). Although there are techniques that can be conducted via text to stimulate non-verbals, such as the use of emoticons (e.g., ☺), this disparity in the amount of non-verbal information between online and in-person contact remains substantial (Pollock, 2006). Consequently, subtle elements to human interaction, such as sarcasm, become difficult to decipher when relying solely on text communication. However, evidence exists indicating that a strong working alliance is still possible even in the absence of non-verbal communication. Cook and Doyle (2002) compared the reported level of working alliance for 15 participants treated via online text-chat therapy to an equivalent in-person treatment group and found no significant differences in the quality of the working alliance. This suggests that a working alliance can be developed in the absence of non-verbal information.

Barak, Hen, Boniel-Nissim, and Shapira (2008) conducted a comprehensive meta-analysis of Internet-based psychotherapy interventions that included 92 studies and 9,764 participants. The results of the analysis indicated a medium effect ($d = 0.53$), which suggests that treatment via the Internet can be effective. However, this collection of studies included a variety of different media such as, websites, chat-rooms, therap-e-mail and text-chat therefore the effectiveness of different forms of Internet-based media for addressing specific psychological disorders remains unclear. Most of the research that has been conducted on synchronous chat has been qualitative and inconsistent due to a lack of accepted standards (Barak, Klein, & Proudfoot, 2009). Thus, given the current state of research regarding text-chat therapy and the inability to communicate non-verbal information in a manner comparable to

in-person, it might not be the most appropriate media for extending psychological services to remote/isolated clients. Therapy via video-based technology however, may be a more suitable option.

2.3.5 Video-Based Therapy

The first form of video-based therapy that became widely available was videophones, which worked in a similar manner to a typical telephone but the audio image was accompanied by a video image (Cukor et al., 1998). However, despite the availability of these devices in the early 90's the quality of the video image was poor and the screen size was small therefore they did not become utilised by the general public or health professionals to a great extent (Menon, 2001). Cukor et al. (1998) reviewed the scant literature available pertaining to mental health services via videophones as well as reflecting on their own clinical case examples via the technology, and concluded that the majority of communication occurs via the audio channel and that the video channel does not adequately capture non-verbals such as nods, blinks and facial expressions but does add a sense of 'social presence'. May et al. (2001) found that although the mental health workers in their study were initially enthused about the expansion of the telephone to encompass video communication, upon use they found that the technology limited their clinical practice because of the stilted communication and reduced non-verbal information. The clinicians believed that the videophones negatively impacted their ability to develop a solid therapeutic alliance. However, despite these drawbacks videophones have been successfully used to assess depressive symptoms and cognitive functioning in the elderly (Menon, 2001), to help the elderly in nursing homes maintain contact with their long distance families (Mickus & Luz, 2002) and to provide CBT to hospice caregivers (Demiris, Oliver, Wittenberg-Lyles, & Washington, 2011). Although there are sources of evidence supporting their use, videophones are out-dated technology and unlikely to be used in the future.

The second form of video-based therapy is videoconferencing, which can be conducted via a variety of technologies. Videoconferencing was first conducted using televisions connected via a direct link (Wittson, Affleck, & Johnson, 1961; Wittson & Benschoter, 1972; Wittson & Dutton, 1956). Although this early research was promising the technology was not sufficient to be used without additional service operators, nor could it be conducted on open circuits or to connect multiple locations.

The second form of videoconferencing to emerge was conducted via satellite (Chen, Eckhardt, Sinkowitz-Cochran, & Jarvis, 1999; Hughes, Horle, Skipworth, & Koudelka, 1994). However, these systems were also extremely expensive and not easily available for clinical practice.

The third form of videoconferencing emerged in the early 1990's with the invention of integrated service digital networks (ISDN). The ISDN allowed audio-visual data to be transmitted via standard telephone lines and at each end point was a dedicated videoconferencing device. As the quality of ISDN technology improved so did the television devices and the accompanying software that utilised this technology. Hence, the videoconferencing devices that were used throughout the 1990's were out-dated by the turn of the century and thus many of the conclusions drawn on these early studies have also become out-dated.

The fourth and most modern method of videoconferencing is conducted via the Internet using computer software to manage the digital interaction. The quality of the transmission depends heavily on the speed and reliability of the Internet connection. Faster Internet connections enable greater quality transmissions to occur. However, videoconferencing conducted either via ISDN or Internet-based systems are both superior to closed television circuits and, due to recent improvements in the technologies over the last decade, they have become the cheapest and most widely available method of conducting videoconferencing. Furthermore, videoconferencing via ISDN or via the Internet bear the closest resemblance to in-person interactions (Richardson et al., 2009; Simpson, 2009)¹. Hence, the remainder of this literature review will be focused on research studies that utilised either of these two videoconferencing technologies.

2.4 Potential Benefits of Videoconferencing For Mental Health

As mentioned above, people living in rural and remote areas can have considerably less access to services than those that live in urban areas (Roufeil et al., 2007). Hence it stands to reason that videoconferencing have the potential to be of benefit to such populations. But the potential benefits of videoconference-based

¹ It is important to acknowledge that videoconferencing can also be conducted via the Internet using a smart phone, such as the Apple iPhone, or a tablet device, such as the Apple iPad, but unfortunately these technologies were not available prior to the commencement of this PhD and thus were not considered for investigation. Nevertheless, future research should look at investigating these technologies in the context of mental health.

mental health services are not limited to increased access for rural populations. In the following several of the potential benefits of videoconference-based mental health services will be discussed.

Videoconference-based services allow clinical interaction to occur across distance. Consequently, clinicians that are in demand due to specialised services within their field can provide services to clients in multiple locations. It is for this reason that videoconference-based services could be used to increase access to culturally relevant services (Shore, Savin, Novins, & Manson, 2006). For example, a clinician from, or specifically trained in, working with a particular ethnic minority could see clients from that cultural group regardless of their location. Being able to match the service provider to the cultural needs of the client may help to facilitate rapport and trust with the clinician.

According to the U.S. Department of Health and Human Services (2001) the rural older adult population is likely to drastically increase in the near future. This increase in the proportion of older adults is expected to put further strain on the limited mental health services. Australia and Europe also face a similar set of circumstances (Gray, Wright, Cutler, Scuffham, & Wooton, 2009; Savolainen, Hanson, Magnusson, & Gustavsson, 2008). For older adults that are institutionalised there is an even greater risk that they will suffer from mental health problems than their non-institutionalised counterparts (Jones, 1999). Hence, videoconferencing services could prove to be instrumental in increasing access to specialised mental health care for older adult populations and reducing the burden on existing rural mental health services. Frail older adults may also have difficulty attending appointments, particularly in busy urban areas. Johnston and Jones (2001) noted in their research on videoconferencing with older adults that many of the participants expressed appreciation for not having to endure the discomfort of a lengthy trip to the clinic. Similar observations were made in a study by Shores et al. (2004) whereby older adults were diagnosed both in-person and via videoconference and reported a preference for diagnosis via videoconference because it did not involve travel.

Another advantage of videoconferencing is that it has the potential to provide services to clients who have physical disabilities. For many clients with physical disabilities, such as people with quadriplegia, it may take a considerable amount of time, organization and cost to take the transportation necessary to reach their

appointment. If such clients were seen via videoconference then there would be no need for them to make the journey.

There are several advantages that specifically pertain to prison populations (Brett & Blumberg, 2006). First, similar to providing increased access to culturally relevant services, videoconferencing can also be used to increase inmate access to clinicians specialised in prison populations. Second, when interacting with clients via videoconference it is impossible for the client to physically harm the clinician. Consequently, the clinician can work with violent offenders without fearing for their own safety. A third issue relevant to prison populations and videoconferencing is the reduced need for inmate transportation. Hence, videoconferencing can reduce the costs of caring for prison populations and increase the safety of the community (Ax et al., 2007; Magaletta, Fagan, & Ax, 1998). A fourth advantage is that services via videoconference can be provided in a timelier manner than emergency in-person interactions. Thus, clinical intervention can be provided earlier, which may help to decrease inmate volatility and as a result increase both staff and cellmate safety (Magaletta et al, 1998). However, the capacity to provide earlier services than what would be provided in-person is not limited to prison populations.

Several studies have reported anecdotal evidence on the use of videoconferencing technology to provide timely clinical services. Pollard and LePage (2001) noted that videoconferencing services enabled earlier access to services in an in-patient setting. Jones (1999) described a case in which frequent follow-up medication adjustments were conducted via videoconference. The use of the technology in this instance allowed the clinician to find the right dosage much quicker than what would have occurred if the clinician had been limited to their usual monthly in-person visits. Jones (1999) also provided anecdotal evidence regarding the use of videoconferencing to provide timely services for a participant with episodic delirium. The capacity to access timely services is particularly important in the context of clients under seclusion (involuntary confinement of a client) and/or restraint (physical force to restrict client movement). Although the purpose of forced seclusion and/or restraint is to prevent the individual from harming either themselves and/or someone else, it is understandably a distressing experience that should not be prolonged more than necessary. Hence, the health regulations in the USA stipulate that anyone under these conditions should be assessed within one hour of the initiation of the restrictions, which can be difficult to achieve given the limited availability of

appropriate qualified clinicians (Setterberg et al., 2003). Setterberg et al. (2003) noted in their study on 15 participants under seclusion and/or restraint that videoconferencing enabled participants to receive services sooner than in-person, often while they were still under seclusion and/or restraint. Yet, it is unclear at this stage as to what degree of benefit is provided to clients treated via videoconference under these conditions above and beyond what can be accomplished in-person.

Evidence also exists that treatment via videoconference may be more beneficial than in-person intervention for some older adult populations (Savenstedt, Zingmark, Hyden, & Brulin, 2005). Savenstedt et al. (2005) used conversation and discourse analysis to investigate older adult joint attention in interpersonal interactions via videoconference. It was noted that when interacting via videoconference non-verbal communication is generally restricted to the waist up due to the limited view of the camera. Although this could be argued as a limitation of videoconferencing in some settings, Savenstedt et al. (2005) found that this limited view appeared to help participants with dementia stay focused on the interpersonal interaction and maintain joint attention because there was less likelihood of distraction. Although this finding is promising, it requires further investigation to determine how much this increased attention benefits treatment outcomes.

Reduced interpersonal distress via videoconference is a commonly cited benefit of videoconference-based clinical interaction. Bakke, Mitchell, Wonderlich, and Erickson (2001) noted that some of their participants with Bulimia stated “it was somewhat less intimidating than working with someone in the flesh” (p.456). In a related study on Bulimia (Simpson, Bell, Knox, & Mitchell, 2005) several participants asserted that they felt more comfortable and relaxed via videoconference than they would have in-person. Some of the participants also reported feeling able to speak more freely; having better control over their emotions, fewer perceived feelings of pressure, intimidation, intrusiveness and scrutiny from the clinician; reduced feelings of embarrassment due to being less self-conscious; and a greater sense of control because they felt like they could leave the room at any time. One of the participants in a study on OCD commented “I was a little less nervous in the beginning because someone wasn’t directly in the room with me” (Himle et al., 2006, p.1827). Shore, Savin, Novins, and Manson (2006) report how one boy with Asperger’s Syndrome appeared to be able to communicate better via videoconference than in-person, which they believed was due to the boy’s interest in movies and the interpersonal distance

provided via the digital media. Given that similar findings have been found regarding reduced interpersonal distress via videoconference across several studies, this issue warrants further investigation in future research.

Although the evidence reviewed show the potential benefits of videoconferencing for specific client groups, there is also a possibility that services via videoconference may result in benefits for clinicians and society. Gorton (2008) has made note of several benefits that clinicians could experience as a result of providing videoconferencing services. For example clinicians could use videoconferencing services to expand their current practice and provide supplemental income. Videoconferencing could be used to enable clinicians to work flexible hours, work from home, or continue to see clients when travelling abroad. Furthermore, clinicians would not need to rent expensive offices in centralised urban centres because they can practice at a place of their convenience. Being able to work from home or at a location convenient to the clinician also has the potential to reduce pressure on hospital and emergency department admissions. For example, the utilization of remote emergency psychiatric and/or psychology services might negate the need for the client to present at the hospital emergency department. Also, the hospital would not need to have a permanent space for such specialists to practice in-person thus freeing up space in the emergency department. However, to the author's knowledge, many of these issues are yet to be fully addressed and explored in the literature. Therefore, the validity of these benefits remains to be established. Another potential benefit of videoconferencing for clinicians is increased access to clinical support and training.

The research findings pertaining to clinical support and education indicate that it can be successfully provided via videoconference and is of benefit to those involved (Grady et al., 2011). Examples in the videoconferencing literature include providing remote educational services pertaining to psychological issues for general practitioners (Hilty, Yellowlees, & Nesbitt, 2006), students working in rural health care (Loera, Kuo, & Rahr, 2007), child mental health workers (Fahey, Day, & Gelber, 2003), psychiatric nurses (Heckner & Giard, 2005), providing consultative services for rural physicians addressing child sexual abuse cases (Burton, Stanley, & Ireson, 2002), psycho-oncology (Xavier, Shepherd, & Goldstein, 2007) and post-acute burns education for occupational therapists (Smith, O'Brien, & Jakowenko, 2006). Supervision for psychotherapy has been successfully implemented via

videoconference (Gammon, Sorlie, Bergvik, & Hoifodt, 1998; Sorlie, Gammon, Bergvik, & Sexton, 1999; Abbass et al., 2011), as has specific CBT training for rural mental health workers (Rees & Gillam, 2001; Rees, Krabbe, & Monaghan, 2009). Gelber (2001) conducted a survey of child and adolescent mental health clinicians working in rural regions that had used videoconferencing technology during the course of their work and found that over 90% reported that the technology was useful for improving knowledge/skills, strengthening relationships with colleagues and decreasing their sense of isolation. Videoconferencing technology has also been shown to be useful in helping Swedish medical students to learn about trans-cultural psychiatric issues from refugee mental health workers in Australia and the USA (Ekblad et al., 2004).

The studies reported above show strong support for the utility of videoconferencing for providing remote clinical supervision and training. The studies above also indicate that clinical interaction via videoconference has the potential to provide a diverse array of benefits to both clinicians and clients. However, the evidence thus far regarding the specific benefits of videoconferencing over in-person services for specific populations should be regarded as speculative at this stage. Furthermore, before the specific advantages over in-person services are researched to a greater extent it is important to first establish if videoconference-based services are as efficacious and effective as in-person. One issue of particular importance is the cost effectiveness of videoconference-based mental health services.

2.5 Cost Effectiveness of Videoconferencing

It is intuitive that clinical services via videoconference would result in a cost savings for either the client or the clinician, depending on who pays for the travel costs. However, evaluating cost effectiveness is not a simple process due to the many factors that contribute to this outcome, such as the loss of potential earnings if travelling, technical support and staff training (Simpson, 2009). Hence, although several studies have been conducted investigating the cost of videoconference-based mental health services, each study has taken into account a slightly different array of factors. Shore, Brooks, Savin, Manson, and Libby (2007) reported the cost of implementing the Structured Clinical Interview for the DSM (SCID); (First, Spitzer, Gibbon, & Williams, 1996) to assess American Indian veterans between 2003 and 2005 and found that the videoconferencing services cost \$1,700 more than in-person

assessments in 2003 but by 2005 the videoconference-based assessments were \$12,000 less than in-person assessments. This change in cost reflects the rapid pace technology is advancing, which in turn reduces the cost. Furthermore, once established, the more the technology is used the cheaper the costs are per consult. From a governmental perspective, Jong (2004) investigated the amount of money saved when seeing 71 participants via videoconference for suicide assessment who resided in remote communities and reported a total saving of \$140,088. Videoconference-based services have also been found to be cost effective in in-patient settings (Mielonen, Ohinmaa, Moring, & Isohanni, 2000).

But not all assessments of cost have reported encouraging findings. Werner and Anderson (1998) concluded in their review of the literature that telepsychiatry services were not technologically feasible and nor were they economically supportable. However, such reports in the literature have become out-dated due to the recent advancements in technology over the last decade. For example, in a more recent analysis of the cost savings for a videoconference-based paediatric mental health service in remote Queensland, Smith et al., (2007) reported a net saving of \$420,000 compared with in-person services. Thus, the current state of the literature pertaining to videoconference-based mental health indicates that it is cost effective in comparison to in-person services (Monnier, Knapp, & Frueh, 2003 Richardson et al., 2009; Simpson, 2009). Furthermore, the differential cost between in-person and videoconference-based services is likely to increase over time as the cost of the equipment reduces and the equipment that is purchased becomes utilised to a greater extent. However, before videoconferencing can be widely used in the clinical context it is important to address the legal and ethical issues regarding the use of the technology.

2.6 Legal and Ethical Issues Pertaining To Videoconferencing

Unfortunately much of the literature pertaining to the legal and ethical issues of videoconferencing have focused on elucidating the issues rather than addressing them (Koocher, 2007; Manhal-Baugus, 2001). Nevertheless, the issues raised can be used to guide clinical practice via videoconference. Confidentiality will always be an issue with regards to therapy via digital means because no technological system can be 100% secure (Bloom, 1998). However, software exists that can make breaches of confidentiality difficult, such as encryption and firewall software (Manhal-Baugus,

2001). Mauhal-Baugus (2001) advise that clients should be fully informed about how the clinician stores transcripts and/or recordings of sessions. The setting can also have a bearing on confidentiality. For example, due to the limited view of the camera lens it is not possible to guarantee that the client is the only person in the room (Bloom, 1998). When interacting with a client via videoconferencing Koocher (2007) recommends that clinicians obtain and document the client's consent to communicate with them electronically. Audio via videoconference typically occurs at a slightly louder volume than in in-person interactions hence there can be a greater risk of someone hearing the conversation in an adjacent room (Mitchell, Myers, Swan-Kremeier, & Wonderlich, 2003). Therefore when conducting videoconference-based sessions it is recommended that the consulting room on both ends of the interaction adequately contain the audio and an external person, such as a receptionist, can make sure that there is only one person in the consulting room at a time. Interaction via videoconference may allow for greater confidentiality for rural client's as rural clinician's in small towns are likely to know common acquaintances and/or visit the same local shops, hence interaction via videoconference reduces the risk of these dual relationships (Mitchell et al., 2003).

Another issue regarding digital interaction is the risk of illegal misrepresentation of services and or misuse of the services provided (Koocher, 2007). For example, it may be easier to forge documents indicating competency and accreditation to professional bodies online than in-person. A further issue pertains to the potential recording of sessions. If a client records the sessions from their own personal computer they could be posted on sites such as YouTube or Facebook without the therapist's knowledge. As a result of this potential threat some clinicians may become more guarded about what they communicate with their clients via digital technology (Koocher, 2007).

Koocher (2007) also raises several questions pertaining to the contracting of psychological services via videoconference that are worth considering. For example, clinicians will need to decide if they will limit their digital work to clients they have already seen in-person or if they will accept new clients into their digital practice (Koocher, 2007). Other unanswered questions raised by Koocher (2007) include; which services will clinicians offer digitally; referral, diagnosis, treatment and/or emergency services; and will reimbursement fees differ for online services?

When guidelines pertaining to telemental health services are not available it is possible to use existing legal and ethical guidelines to guide clinical decisions. Reed, McLaughlin and Milholland (2000) have provided several interdisciplinary principles that can be used to adapt existing ethical practice guidelines for use with telehealth. For example, Reed and colleagues argue that basic standards of professional conduct relevant to the profession should not be altered when providing services via telehealth. Basic standards of professional conduct include practicing within the scope of one's training and experiences, maintaining confidentiality, obtaining client consent and avoiding harm; such standards should not be lowered for telemental health services. Another requirement of best practice is to maintain accurate and relevant documentation pertaining to client encounters. Translating this guideline into best practices for telemental health requires little adjustment other than to be mindful of how that documentation is stored (Nelson & Velasquez, 2012). Digital documents should be stored through secure software and kept for a period of time in keeping with current ethical guidelines.

Due to increased availability and decrease cost of technology the use of advanced psychotherapy training occurring via videoconference is on the rise (Abass, et al. 2011). Increased access may help to provide timely clinical supervision and help mental health workers unfamiliar with videoconferencing technology gain confidence with it before working with clients. This is integral to conducting ethical practice because clinicians must practice within their areas of professional competence. Clinicians new to working via videoconference should seek out clinicians experienced in providing services via videoconference.

Ethical guidelines specific to telemental health regarding the provision of psychological services via the Internet have been developed (Australian Psychological Association, 2004; Ohio Psychological Association, 2008). These guidelines provide flexible instructions for clinicians to follow when using digital media to conduct therapy. Psychologists using videoconferencing should recognise that the service may not be appropriate for all problems, and decisions regarding its use should be addressed on a case-by-case basis in line with the relevant district's governing code of ethics. The guidelines also stipulate that the provision of videoconferencing services should not be given if they occur in direct contradiction of local or state laws in which the client and/or therapist reside. When obtaining consent, information regarding the services, clinician experience and potential risks should be given in a manner

appropriate for the client and reasonable attempts to verify the identity of the client should also be conducted. The guidelines further stipulate that where possible secure transmissions should be used and that unauthorised personnel cannot access any stored communications. However, as Luxton, Sirotin, and Mishkind (2010) note, the rate at which the technology associated with videoconferencing advances outpaces the development of the related policies dictating its use. Hence, technology now exists that can enable videoconferencing to occur on personal PC's and handheld devices, which means that videoconferencing services can be provided to unsupervised settings, such as the client's home. In unsupervised settings there may not be the resources available to deal with problematic clients, such as those that become suicidal, homicidal or have uncontrollable panic symptoms (Luxton, Sirotin, & Mishkind, 2010). Furthermore, technological problems may arise more frequently when interactions encompass an array of personal devices that may vary in the quality of transmission. Thus, it may be best to limit practice via videoconference to supervised settings, such as hospitals, universities and remote/rural general practices until guidelines exist pertaining to unsupervised settings.

2.7 Potential Disadvantages Of Telemental Health

In addition to the potential benefits of providing remote mental health services via videoconference there are also several disadvantages that need to be considered. Human interaction via videoconference does not allow the clinician to smell the client (Mielonen, Ohinmaa, Moring, & Isoanni, 1998). A strong odour of alcohol, glue, food or body odour cannot be detected via videoconference and therefore the client might be able to better hide addiction, binge eating or self-care issues. Mental health workers in private practice may be reluctant to invest into remote technology when they could earn the same amount of money by treating clients that are local. If a private practice clinician were to specialise in treating mental health remotely then it would be logical to develop a practice that is linked to multiple locations in which the technology at both ends could be controlled by the clinician. However, servicing multiple locations will increase the initial cost of establishing the business.

Wade, Karnon, Elshaug and Hiller (2010) conducted a systematic literature review of economic analyses of telehealth and found that although health services via videoconference were more cost effective than in-person services for remote clients, it was not a cost-effective form of treatment for providing services between local

hospitals and primary care. Therefore, if clinicians do enter into videoconference-based private practice greater cost saving are only likely to occur if the clients are located at a substantial distance from the services. If clinicians in such business cannot obtain enough work with remote clients then their services might not remain economically viable.

Interacting with multiple locations is likely to amplify the administrative difficulties (Simpson, 2005). For example, if multiple locations are involved rapport needs to be generated with a variety of separate communities and advertising needs to occur in all of the locations, which may further increase both the cost of the study and the need for further human resources. Human resources would also be needed to manage clients that might be operating in different time zones (as is the case with Australia) and additional staff may be needed in each location to make sure that the technology is easily available for clients when they get to the remote clinic (Nelson & Bui, 2010). Additional administrative costs may arise if a remote technology support service for software difficulties is needed, which is likely to be the case when the technology is connected to multiple locations using a variety of technology.

Another potential disadvantage of remote mental health services, and remote services in general, is the effect it may have on the community economy. A substantial number of the people that reside in remote communities are employed in the health industry (ABS, 2009). If people no longer need to live in the rural environment to work then they may return to metropolitan locations. Many people choose to live in rural locations because they enjoy the lifestyle but if a reduction does occur local rural businesses may suffer as a result. Given that there is, to the author's knowledge, no research that has been conducted into how telemental health services affect remote communities it will be important to monitor how the implementation of remote services affects the employment demographics and rural communities in general.

2.8 Setting Of Videoconference Consultation

Videoconferencing services have been provided in a variety of different settings. The most frequently used setting has been in hospital-based outpatient services (Grady et al., 2011). The general findings in the literature pertaining to outpatient settings indicate that assessment, diagnosis and treatment can be successfully implemented in such settings (Monnier, Knapp, & Frueh, 2003,

Richardson et al., 2008; Simpson, 2009). Some studies have been conducted in hospital in-patient settings (Grady & Singleton, 2011; Holdan & Dew, 2008; Mielonen et al., 2000; Pollard & LePage, 2001) and have reported that videoconferencing services in such settings is not only possible but can improve clinician efficiency. Recommendations have been made in the literature regarding the appropriate setting of the videoconferencing consultation room (Grady, et al, 2011; Major, 2005). When interacting via videoconferencing it is preferable to provide adequate lighting, a suitable background image, comfortable seating, the capacity to adjust the brightness of the image, volume controls, and remote clinician control of the client's videoconferencing device. Furthermore, clinicians have been recommended to wear solid colours as this helps improve the clarity of the image and reduces bandwidth usage (Grady et al., 2011). Although it is important to determine which settings videoconferencing can be provided in, it is also important to determine if users of the technology find it satisfactory.

2.9 Satisfaction Studies Pertaining To Videoconferencing

Despite the necessity of determining if both clients and clinicians find videoconference-based mental health services satisfactory and acceptable, assessing these issues is not a straightforward task. Simpson (2009) asserts that the reported level of satisfaction a client experiences with a given mode of interaction may not necessarily be what is best for the client. For example, a client with dependency issues may report a preference for in-person interactions but they might most benefit from the space and independence of videoconferencing interactions. Conversely, a client who fears intimacy may prefer treatment via videoconference when in fact they might benefit more from an in-person interaction. Nevertheless, despite these difficulties a substantial body of research exists investigating client satisfaction with videoconference-based mental health services.

In order to determine if the ratings of client satisfaction differ between videoconference and in-person a variety of RCT studies have been conducted. The results of these studies have revealed no significant differences in participant ratings of satisfaction between in-person and videoconference for depressed veterans (Ruskin et al., 2004), child and adolescent populations (Kopel, Nunn, & Dossetor, 2001) and outpatients with neurological conditions (Chua, Craig, Wootton, & Patterson, 2001). Although the following studies lacked a control group, high levels of participant

satisfaction have also been observed in acute open hospital wards (Sorvaniemi, Ojanen, & Santamaki, 2005) and inpatient settings (Mielonen et al., 2000). However, despite the positive outcomes of the above literature pertaining to satisfaction, the methodological designs used in these studies may not adequately capture difference in participant satisfaction between conditions.

Few studies have exposed participants to both in-person and videoconference-based interactions and measured satisfaction in both conditions. Consequently, it is difficult to determine whether the reported levels of satisfaction in previous research reflects the participant's ability to adapt to the media provided or if it is an accurate reflection of his/her satisfaction (Simpson, 2009). Nonetheless, Cluver, Schuyler, Frueh, Brescia, and Arana (2005) used a study design whereby the participants alternated between in-person and videoconference-based interactions. The results of their study indicated that the participant ratings of satisfaction and feelings of 'connectedness' were not significantly different between conditions. This finding provides evidence supporting the conclusions made by previous RCT studies that there is little difference in client satisfaction between the two media.

Although the majority of research indicates that there is little if any difference in ratings of satisfaction between in-person and videoconference, not all studies examining satisfaction have been favourable. In a study by Rohland, Saleh, Rohrer, and Romitti (2000) it was reported that a third of participants who received videoconferencing services expressed concerns about confidentiality. Simpson, Deans and Brebner (2001) reported that one of the participants in their study stated that she experienced the interaction via videoconference to be 'dehumanizing' and 'unsettling'. However, overall there are relatively few reported cases of participants harbouring negative opinions pertaining to modern videoconferencing.

Clinician resistance has been frequently noted in the literature. Early research (Wittson & Benschoter, 1972) reported that many of the staff using video-based interactions were initially hesitant to use the technology but once they gained some experience with it this hesitancy ceased. This pattern of initial resistance and anxiety subsiding with exposure to the technology has been a reoccurring observation (May et al., 2001; Shores et al., 2004). Anecdotally Bouchard et al. (2000) noted that some of the therapists in their study stated that "they forgot they were talking through a camera to somebody kilometres away. They felt completely involved in the therapy, as if it was happening face to face" (p.1006). Such comments reflect the need for

some clinicians to undergo training and/or practice sessions to gain exposure to the technology so that they can become at ease with it. Another issue that needs considering is the effect that interacting via videoconference may have on the therapeutic alliance.

2.10 Therapeutic Alliance Research Pertaining To Videoconferencing

The therapeutic alliance between client and therapist forms an essential ingredient of effective treatments (Horvath & Greenberg, 1989), hence it is important to consider how interacting via videoconference influences the interaction. Initial reports in the literature using low quality early technology devices indicated that rapport building was hampered by sound delays and image pixilation (Kirkwood, 1998). Since these initial studies the quality of the technology has greatly improved thus many of the earlier conclusions are no longer relevant. There is evidence to suggest that rapport is not compromised via videoconference for the treatment of eating disorders (Simpson et al., 2005), OCD (Himle et al., 2006) and panic disorder (Bouchard et al., 2004). Simpson (2009) suggests that there are several setting variables that may help facilitate digital rapport, such as a dedicated room for the interaction that will not be interrupted, as well as tissues, a comfortable chair and a telephone for times of disrupted digital contact. Rees and Stone (2005) conducted a study in which psychologists watched two identical (simulated) therapy sessions but one was conducted in-person and one via videoconference. The psychologists in the study rated therapeutic alliance in the videoconferencing condition as significantly lower than in the in-person condition. This finding suggests that psychologists expect a poorer therapeutic alliance via videoconference.

Germain, Marchand, Bouchard, Guay, and Drouin (2010) investigated the strength of the therapeutic alliance during the course of CBT treatment for 29 participants in the in-person condition and 17 participants in the videoconferencing condition. The findings from their study did not reveal any significant differences between conditions. A similar result was observed in the research conducted by Greene et al. (2010), which included 112 participants randomly assigned to either in-person or videoconference-based group psychotherapy for PTSD. Although there was a greater chance of being able to detect a significant difference between conditions due to the larger number of participants, the findings again did not indicate a significant difference in the therapeutic alliance between conditions. Given the limited

number of controlled trials that specifically investigate the therapeutic alliance from both the client and clinician's perspective, it is evident that further research is needed.

2.11 Diagnosis Via Videoconferencing

Diagnosis is also an essential component of evidence-based treatment planning hence a substantial amount of research has been conducted assessing the utility of videoconferencing technology for diagnostic purposes. Diagnosis via videoconference has been found to yield comparable results to in-person diagnosis for schizophrenia (Zarate et al., 1997), depression (Kobak et al., 2010), disorders in older adult populations (Jones, Johnston, Reboussin, & McCall, 2009), post-traumatic stress disorder (Porcari et al., 2009), dementia (Shores et al., 2004) and with child populations (Elford et al., 2000).

Despite the overwhelming majority of studies indicating that diagnosis via videoconference can be as effective as in-person, some studies indicate that when using low-quality technology accurate diagnosis may be more difficult (Zarate et al., 1997). However, this has become less of an issue since higher quality technology has become easily available and affordable. According to Grady et al. (2011) clinicians experienced in the use of videoconferencing technology may have less difficulty diagnosing conditions when using poorer quality equipment than clinicians inexperienced in the use of videoconferencing. Experienced clinicians may be more likely to distinguish between real movements and motion artefacts in the digital image and/or compensate for any audio/visual delays.

Several studies have reported the findings of neuropsychological assessment via videoconference with favourable results. Examples include the cognitive section of the Cambridge Mental Disorders of the Elderly Examination (Ball & Puffett, 1998) and the Mini-Mental State Examination (Grob, Weintraub, Sayles, Raskin, & Ruskin, 2001). However, the use of such neuropsychological assessments should be interpreted with caution because norms have not yet been established for videoconference-based assessments (Grady, 2011). Hyler, Gaungure, and Datchelder (2005) conducted a meta-analysis on 14 studies ($N = 500$) comparing in-person to videoconference-based psychiatric assessments. The results did not indicate a significant difference between conditions. Thus, overall, the findings in the literature indicate that diagnosis via videoconference can be as successful as in-person.

2.12 Treatment Via Videoconference

The literature reviewed thus far indicates that videoconferencing is a form of telemental health that bears the closest resemblance to in-person interactions, can be conducted in a variety of settings and it is a cost effective method of providing services. Furthermore, the literature indicates that clients find the services via videoconference highly satisfactory, a strong therapeutic alliance can be formed, and diagnosis can be successfully conducted via the media. Hence, the focus of this review will now shift towards exploring the different forms of psychological treatment that can be provided via videoconference. Greater detail regarding the treatment of specific disorders is provided in section 2.12.

2.12.1 Individual Psychotherapies

One-to-one based psychological treatment remains the most commonly utilised format for psychotherapy (Barlow, 2008) hence the majority of studies via videoconference have also been conducted on a one-to-one basis. Most telemental health studies have been conducted on adult populations, therefore, unless otherwise stated, the literature review below refers to adult populations. The array of different treatment orientations in the literature pertaining to videoconferencing is almost as diverse as the field of psychotherapy. For example, in a variety of case studies and small non-randomised trials, treatment via videoconference has been successfully implemented, with positive results, using supportive therapy (Bose, McLaren, Riley, & Mohammedali, 2001), exposure therapy for gambling problems (Oakes, Battersby, Pols, & Cromarty, 2008), rapid eye movement desensitization for acute stress disorder (Todder & Kaplan, 2007), hypnosis (Simpson, Morrow, Jones, Ferguson, & Brebner, 2002) and self-management programs for stroke sufferers (Huijbregts, McEwen, & Taylor, 2009). Videoconferencing services have also been used to provide carer education for family members of people diagnosed with schizophrenia (Haley et al., 2011).

The majority of studies in videoconference-based treatment have implemented CBT. Case studies have been conducted on panic and agoraphobia (Cowain, 2001), acute distress disorder (Todder, Matar, & Kaplan, 2007), OCD (Himle et al., 2006), bulimia (Simpson et al., 2006), mixed anxiety and depression (Day & Schneider, 2002; Griffiths, Blignault, & Yellowlees, 2006; Manchanda & McLaren, 1998) and

rural cancer patients with adjustment disorder or major depression (Cluver et al., 2005).

Several studies have been conducted investigating the efficacy of one-to-one videoconference-based CBT for specific disorders using RCT designs. Examples include the treatment of childhood depression (Nelson, Barnard, & Cain, 2003), panic with agoraphobia (Bouchard et al., 2004), and bulimia (Mitchell et al., 2008). All three studies did not observe significant differences between in-person and videoconference-based services. Further details on these studies are provided in section 2.12.

Shepherd et al. (2006) investigated the effectiveness of CBT via videoconference for 25 participants with cancer who lived in rural Australia. Although on average client symptoms significantly improved from pre to post-treatment and were maintained at one month follow-up, the number of sessions attended by participants ranged from one to six and there was no control condition. Therefore the findings by Shepherd et al. (2006) provide preliminary evidence of the effectiveness of videoconference-based CBT. Poon, Hui, Dai, Kwok, and Woo (2005) conducted a RCT in Hong Kong investigating the effectiveness of CBT via videoconference for older adults with mild cognitive impairment and/or mild dementia in a community setting. No significant differences between treatment conditions were observed, which indicates that CBT via videoconference can be effective in improving mild cognitive dysfunction in a 'real-world' community sample.

Collectively, these studies demonstrate that videoconferencing services can be applied to a wide range of conditions, types of psychotherapy and mental health settings. The research also suggests that CBT via videoconference can be efficacious and effective. However, further research is needed investigating if CBT via videoconference is effective across broad diagnostic populations.

2.12.2 Group And Family Psychotherapies

Group therapy is another frequently used format for delivering psychotherapy (Yalom & Leszcz, 2008). There are two ways in which group therapy could be conducted via videoconference. The first involves situating the clients in the same room with the therapist situated at a distal location and displayed via the videoconferencing equipment to the group (Morland et al., 2010). Wittson et al.

(1961) was the first to study group therapy via a closed television circuit and found that although some of the participants showed interest in the technology at first, this soon faded as the typical group process successfully emerged. Unfortunately though, it was not until 40 years later that the early research by Wittson et al. (1961) was expanded.

Deitsch, Frueh, and Santos (2000) reported the details of the first case report that described the successful implementation of videoconferencing technology to treat four veterans with PTSD in a group format. Further anecdotal evidence has been provided by Shore and Manson (2004a) who reported the successful implementation of group therapy via videoconference to American Indian veterans.

Videoconferencing has also been used to provide social support to remote groups of women diagnosed with breast cancer (Collie et al., 2007). However, it was not until Morland et al. (2010) conducted a large non-inferiority trial of group therapy for veterans with PTSD and anger problems comparing in-person treatment to remote clinician treatment via videoconference that more substantive findings became evident (see Section 2.12.7.4 for further details of this study). The results indicated that treatment via videoconference was a feasible and effective way of administering remote group treatment. Davis et al. (2011) came to similar conclusions in their study comparing in-person to videoconference-based group treatment of paediatric obesity. These studies indicate that administering group therapy in which all clients are in the same room can be effective.

The second format of group-based videoconference involves having all of the clients in separate locations interacting simultaneously via the technology (Molyneaux, O'Donnell, Fournier, & Gibson, 2008). Although this second format has the potential to be the most useful to sparsely situated clients, it requires a large amount of infrastructure, high-powered transmissions and complementary software. Some hospitals, such as Graylands Mental Health Hospital in Perth Western Australia, have such technology in place and are currently in operation. But Western Australia is vast and not all rural and remote locations have the necessary complimentary equipment. It is hoped that over time the infrastructure will grow and the technology will become more widely available.

Family therapy involves multiple people and therefore can be considered as a form of group therapy. With regards to family therapy the literature is limited (Kuulasmaa, Wahlber, & Kuusimaki, 2004), but there are three published case

studies. Paul (1997) reported the use of videoconference via satellite to connect a couple going through a divorce. The couple had decided to separate but had unresolved issues that prevented them from finalizing the divorce. The videoconferencing technology helped them to resolve their differences and complete the divorce remotely. Hill, Allman, and Ditzler (2001) reported the use of videoconferencing to connect two active military personnel to their respective distal families, and in a similar study Goldfield and Boachie (2003) reported the use of videoconferencing to connect an anorexic teenager in an inpatient setting with her family. In all three of these studies the technology was reported to have benefited the families involved. However, not all researchers agree on the appropriateness of videoconferencing for group interactions.

Kuulasmaa, Wahlber, and Kuusimaki (2004) have asserted that videoconferencing is likely to be inappropriate for group interactions because the restricted view of the camera might make it difficult to accurately detect and interpret the subtle non-verbal behaviours of group members. However, recent research into group therapy via videoconference has not reported this to be a problem (Morland, Greene, Rosen, Mauldin, & Frueh, 2009; Morland et al., 2010; Morland, Green et al., 2011; Morland, Hynes, Mackintosh, Resick, & Chard, 2011).

2.13 Specific Treatment Populations Treated Via Videoconference

As was noted in Section 2.11.1, a substantial body of research exists regarding the treatment of specific psychological disorders via videoconference. That literature will be discussed in further detail below.

2.13.1 Older Adults

As was briefly noted above, evidence exists indicating that psychological assessment can be successfully implemented for older adult populations via videoconference. The Mini-Mental State Examination has been frequently researched in the literature (Ball, Scott, McLaren, & Watson, 1993; Grob, Weintraub, Sayles, Raskin, & Ruskin, 2001; Montani et al., 1997) and all of the studies reported no significant differences between in-person and videoconference-based assessment. Other assessments have also been conducted on older adult populations via videoconference, such as the Cambridge Cognitive Examination (Ball & Puffett, 1998), the Structured Interview for the DSM-IV (Jones, 1996), the Brief Psychiatric

Rating Scale (Jones, 1997; Jones, Johnston, Reboussin, & MacCall, 2001) and the Geriatric Depression Scale short version (Menon et al., 2001). Furthermore, the diagnosis of specific disorders within older adult populations such as Parkinson's Disease (Hubble, Pahwa, Michalek, Thomas, & Koller, 1993) and Alzheimer's Disease (Loh, Donaldson, Flicker, Maher, & Goldswain, 2007) have also been examined via videoconference, with similar findings. For example, in a study by Shores et al. (2004) investigating the presence of dementia in a group of 85 Veterans living in an aged home care, there was 100% agreement between the in-person and videoconference-based diagnosis. The general conclusion from this prior research is that there does not appear to be a significant difference between in-person and videoconference-based assessment and diagnosis.

Although the majority of the literature has reported findings that support the use of videoconferencing with older adult populations, not all the findings have been positive. In a study by Montani et al. (1997) on assessing the utility of videoconferencing for conducting psychometric consultation it was noted that although the majority of older adults in the study rated videoconferencing to be an acceptable means of communication, 11 out of 15 reported a preference for in-person interaction. This finding suggests that even though most clients perceive videoconferencing to be an acceptable form of communication, some client groups may still have a preference for in-person interactions. Such preferences may reflect generational effects on willingness to use videoconferencing services or it could reflect a more widespread preference in the general population for in-person services over videoconference. Alternatively these findings may not be due to generational differences, they could be due to differences in experience with technology regardless of age.

Mickus and Luz (2002) investigated the impact of low-cost videophones on 10 pairs of nursing home residents and their respective families. They found that the older adults who had a tolerance for technical and/or operating difficulties ended up receiving more social support than would have otherwise been possible. Conversely, older adults who had a low tolerance for technical difficulties, had severe vision or hearing problems, or had impaired cognitive ability to operate the technology were unlikely to benefit from the technology. Similarly, in a more recent study using modern videoconferencing technology Tsai and Tsai (2010) found that many of the older adults perceived videoconferencing to be the second-best option next to in-

person interaction and some participants became distressed by technical problems, such as audio-visual lag, while others reported feeling an increased sense of shyness via the technology. Yet participants also reported appreciating being able to see their family members directly, stated feeling less anxious about family members in between in-person visits and all of the participants felt the technology enriched their lives. Additionally, anecdotal evidence exists indicating that people with greater experience with technology, such as the Internet, computers and mobile phones, are likely to have greater comfort with videoconference-based activities (Shore, Savin, Novins, & Manson, 2006). Hence due to increased technology exposure for younger generations, the difficulties of some participants observed by Tsai and Tsai (2010) may not necessarily continue to be an issue as the younger population ages.

The clinical intervention research on the use of videoconferencing with older adult populations is limited but the findings thus far are encouraging. As mentioned in section 2.11, Poon et al. (2005) conducted a RCT comparing in-person to videoconference-based cognitive treatment for 22 participants with mild dementia or cognitive impairment and reported significant difference between conditions. Huijbregts, McEwen, and Taylor (2009) reported the effects of a videoconference-based manualised self-management treatment program for participants recovering from stroke. In comparison to a non-randomised waitlist control the treatment was shown to be effective. However, this treatment required two facilitators, one via videoconference and the other in-person, therefore it is unclear how much of the clinical change can be attributed to treatment via videoconference and how much is due to an in-person facilitator.

Not all of the findings have been positive. Jones 1997 (cited in Jones 1999) observed that when conducting assessments via videoconference it was difficult to detect balance disturbances and subtle changes in mental status, such as sedation or mild delirium. Jones and Ruskin (2001) commented that videoconferencing assessments can be more challenging than in-person when the participant has sensory impairments. Mickus and Luz (2002) also observed that vision and hearing problems impeded a participant's ability to engage via the media. However, since these studies were published videoconferencing technology has improved. For example, modern videoconferencing equipment is now capable of transmitting a level of clarity sufficient to provide sign language for the hearing impaired (Wilson & Wells, 2009).

More clinically focused research is needed to determine the effects of the technology for specific client groups.

Broadening the focus from clinical efficacy to general clinical feasibility, several studies (Johnston & Jones 2001; Lyketsos et al., 2001; Tang, Chiu, Woo, Hjelm, & Hui, 2001) have indicated that videoconference-based clinical intervention can be successfully implemented in real-world settings for older adults and people with dementia. However, some parameters such as ownership, planning, clientele and location of remote practice can influence the likelihood of successful implementation (Guilfoyle et al., 2002). Regarding the cost of videoconferencing services, Gray, Write, Cutler, Scuffham, and Wootten (2009) found that consultation via videoconference for hospital ward-based clients was less expensive than in-person consultations. Of particular note in this study is that the videoconferencing equipment was situated on a trolley that was wheeled from client to client, which made it possible to see a large array of clients that were mostly limited to their hospital beds. Similar research findings pertaining to the feasibility of videoconferencing services for older adult populations have also been observed in non-western countries, such as Hong Kong (Tang et al., 2001) and specific cultural groups (Yeung et al., 2009), such as Chinese immigrants.

In summary, the literature indicates that diagnosis and assessment via videoconference is comparable to in-person outcomes and clinical practice via the media is feasible. With regards to treatment however, the literature is both limited and mixed. Several treatment studies have shown considerable promise but there is some evidence indicating that videoconferencing might not be suitable for all older adult clients.

2.13.2 Children and Adolescents

A substantial amount of research has been conducted pertaining to videoconferencing services for children and adolescents. Straker, Mostyn, and Marchall (1976) were amongst the first to report on the successful implementation of a television cable link between a medical school and a child health station in East Harlem. As the technology slowly developed further reports began emerging in the literature around the world including Australia (Dossetor, Nunn, Fairley, & Eggleton, 1999), North America (Blackmon, Kaak, & Ranseen, 1997; Ermer, 1999) Scotland (Grealish, Hunter, Glaze, & Potter, 2005), Ireland (Browne, Reilly, & Bradley, 2006)

Russia (Ehrlich, Kobrinsky, Patlakh, Rozinov, & Shabanov, 2007), Norway (Hanssen, Wangberg, & Gammon, 2007), Finland (Pesamaa et al., 2007) and South Africa (Wynchank & Fortuin, 2010). However most of the published articles have focused on the description of telepsychiatry programs and their feasibility rather than on treatment outcomes (Fox, Connor, McCullers, & Waters, 2008; Myers, Valentine, & Melzer, 2008; Ryan, Stathis, Smith, Best, & Wooton, 2005). The emerging literature indicates that satisfaction for both parents and children who have used videoconferencing-based services is high (Blackmon, Kaak, & Ranseen, 1997; Nelson & Bui, 2010; Davis et al., 2011). Furthermore, in a study by Goodenough and Cohn (2004) on children with cancer, favourable opinions towards videoconference-based interactions were observed in both metropolitan and rural participant groups, which suggests that client satisfaction with videoconference-based services is not simply a result of reduced travel for rural clients.

Some studies have been conducted that directly aim to address the accuracy of diagnosis via videoconference for child and adolescent populations. Elford et al. (2000) assessed 23 participants aged between 4-16 years both in-person and via videoconference and the assessment agreement between conditions was 96%. Similar findings have also been observed in larger trials, such as that conducted by Myers, Sulzbacher, and Melzer (2004), which included 369 participants aged between 3-19 years of age. However, studies into the accuracy of diagnosis have mostly used convenience sampling and have lacked randomised control conditions (e.g., Marks, Shaikh, Hilty, & Cole, 2009). Overall the literature indicates that child and adolescent mental health problems can be successfully diagnosed via videoconference.

There are numerous case studies demonstrating the successful implementation of videoconferencing services for specific presenting conditions. Reported conditions that have been treated via videoconference include children with Attention Deficit Hyperactivity Disorder (Hilty, Sison, Nesbitt, & Hales, 2000), brain injury (Wade, Wolfe, Brown, & Pestian, 2005a; Wade, Wolfe, Brown, & Pestian, 2005b), intellectual disability (Buono & Citta, 2007), autism (Machalicek et al., 2009), obesity (Davis et al., 2011) and tic disorders (Himle, Olufs, Himle, Tucker, & Woods, 2010), as well as adolescents with epilepsy (Hufford, Blueckauf, & Webb, 1999) and depression (Alessi, 2002). Videoconference-based clinical interactions have also been used to interview and collect forensic evidence pertaining to child sexual abuse (Mackleod et al., 2009), extend treatment services to incarcerated youths (Myers,

Valentine, Morgenthaler, & Melzer, 2006) and provide treatment for cultural minorities, such as American Indians (Savin, Garry, Zuccaro, & Novins, 2006). A variety of therapeutic orientations have been used throughout this literature including problem-solving family therapy (Wade et al., 2005a; 2005b), functional behavioural analysis (Machalicek et al., 2009) and CBT (Nelson et al., 2003).

In comparison to the number of case studies, there is a paucity of large treatment focused trials exploring the effectiveness of videoconference-based treatments for children and adolescents. Glueckauf et al., (2002) reported on a family intervention program for 22 rural adolescents with Epilepsy who were treated either via videoconference, audio only or in-person. The results indicated no significant differences between treatment modalities. Nelson et al. (2003) conducted a RCT comparing in-person to videoconference-based treatment for depression and also found no significant differences between modalities. Although further research is needed, the evidence thus far indicates that treatment for children and adolescents can be successful via videoconference (Grady et al., 2011, Nelson & Bui, 2010).

2.13.3 Emergency and Involuntary Commitment

As noted in section 2.4, interaction via videoconference can enable psychological services to be administered in a timely fashion (Mannion, Fahy, Duffy, Broderick, & Gethins, 1998; Sorvaniemi & Santamaki, 2002). Hence, videoconferencing services could be used to increase client access to emergency psychological care and reduce the time in which clients are subject to involuntary commitment. Regarding emergency consultations, interaction via videoconference has been shown to be significantly cheaper than transporting clients to an in-person setting (Jong, 2004) and the ratings of acceptance and satisfaction for both clients and staff have been high (Sorvaniemi et al., 2005). Although there are no RCT's pertaining to emergency mental health services via videoconference, Yellowless, Burke, Marks, Hilty, and Shore (2008) report the details of several cases in which videoconferencing was successfully implemented in an emergency setting. The presenting disorders included psychosis, mood disorder, substance-induced disorder and a childhood behaviour disorder. Other examples in the literature include the provision of emergency psychological services to a remote island (Mannion et al., 1998), to a rural woman's crisis centre (Thomas, Miller, Hartshorn, Speck, & Walker, 2005) and to a suicidal veteran (Gross, Kimberly, Martha, Ruggiero, & Acierno,

2011). Videoconferencing services have also been particularly useful in the context of clients under seclusion and/or restraint. Sorvaniemi and Santamaki (2002) investigated the concordance between diagnosis in-person and via videoconference for participants under these conditions. The results of their research indicated that there was little disagreement between in-person and videoconference-based assessment of participants and therefore videoconferencing should be used when available. Extensive guidelines on how best to provide emergency psychological services via videoconference have also been developed (Shore, Hilty, & Yellowlees, 2007). Therefore further research should be conducted investigating the effectiveness of emergency videoconferencing services.

2.13.4 Incarcerated

Incarcerated individuals often have minimal or no access to mental health services, which is unfortunate given that their circumstances are likely to put them at greater risk of ill health (Leonard, 2004a). Most of the literature pertaining to videoconferencing services and incarcerated individuals has focused on program descriptions (Leonard, 2004a; Leonard, 2004b; Myers, Valentine, Morganthaler, & Melzer, 2006) and assessments of the feasibility of telepsychiatry for this population group (Manfredi, Shupe, & Batki, 2005; Nelson, Zaylor, & Cook, 2004). No significant differences have been found between in-person and videoconference-based services regarding; client satisfaction (Brodey, Claypool, Motto, Arias, & Goss, 2000; Magaletta, Fagan, & Peyrot, 2000), therapeutic alliance (Morgan, Patrick, & Magaletta, 2008) or assessment (Brodey, Claypool, Motto, Arias, & Goss, 2000; Nelson et al., 2004). Lexcon, Hawk, Herrick, and Blank (2006) assessed the inter-rater reliability between in-person and videoconference-based assessment and found that there was a high intra-class correlation (.82), indicating little difference between the mediums. Although telepsychiatry treatment can be effectively provided via videoconference for prison populations (Zaylor, Nelson, & Cook, 2001), there are as yet no RCT's investigating the efficacy of treatment in such populations. One study exists reporting the use of telepsychology treatment for this population however the investigation focused on satisfaction and therapeutic alliance issues (Morgan, Patrick, & Magaletta, 2008). Consequently, although the findings thus far indicate that mental health services via videoconference might be effective, further research is needed before stronger conclusions can be made.

2.13.5 Ethnic Minorities

Ethnic minorities often have limited access to culturally appropriate mental health services due to social/cultural isolation and/or remote isolation (Alverson, 2007). Hence, providing culturally relevant services via videoconferencing may be one way of increasing access (Yellowlees, Marks, Hilty, & Shore, 2008). Shore et al. (2006) note that when providing services to ethnic minorities via videoconferencing the clinician should be familiar with the communication style of the relevant patient population group. For example, some cultures find it discourteous to engage in continued eye contact therefore looking away from the screen should not be interpreted as a sign of depression or emotional avoidance. Although there is limited literature specifically addressing the treatment of ethnic and cultural minority groups via videoconferencing, several case studies exist. Examples in the literature include a Mexican-American woman treated for depression (Hilty, Servis, Nesbitt, & Hales, 1999), an American Indian male veteran with PTSD (Shore & Manson, 2004b) and a Hispanic veteran (disorder not stated) (Nieves & Stack, 2007). All three of these studies reported successful treatment and satisfaction outcomes via the technology.

Between 2000 and 2001 a large-scale pilot project by Keresztes et al. (2002) was undertaken to assess the suitability of telepsychiatry services for six of the Nishnawbe-Aski First Nations communities in Ontario. Many of the people who live in these regions are isolated and do not have year round access to main roads. During this time period 25 participants were seen with the most common problems being suicidal ideation, grief, substance abuse, depression and anxiety. Although no formal assessment of symptom outcomes was conducted, their findings indicated that implementing telepsychiatry was a cost effective and feasible means of service delivery (Keresztes et al., 2002).

Shore and Mason (2004a) reported the details of a telepsychiatry service that was provided to 50 American Indian veterans suffering with PTSD. Participants were diagnosed using the SCID and treatment involved a range of services including group psychotherapy, individual therapy and medication management. Shore and Manson found that the participants reported a high degree of satisfaction and comfort with the videoconferencing service. Furthermore, no significant differences between diagnosis conducted by videoconference and in-person were found, nor did the ratings of cultural acceptance differ between conditions. However, the study by Shore and

Manson lacked a control condition therefore it is unclear how the outcomes of this study compare to in-person services for the same population. Also, given the range of services used it is unclear which aspects of clinical interaction via videoconference resulted in the positive outcomes. But this study does suggest that treatment via videoconference can be successful for some cultural groups.

The acceptability of telepsychiatry amongst a sample of American Indians has also been studied. Shore et al. (2008) administered the SCID both in-person and via videoconference and found no significant differences between conditions. Interestingly though, the results indicated that the interviewers rated their participant's satisfaction to be significantly less favourable than the participant's themselves rated their satisfaction with the services. These findings concur with previous research indicating that clinicians are likely to have prior negative beliefs about videoconference-based services that may bias their judgment of the services (Rees & Stone, 2005). However, only two interviewers were used in the study by Shore et al. (2008), therefore this finding should be interpreted with caution. Yet, on the basis of this research it appears the some cultural groups may find videoconference-based mental health services to be an acceptable and satisfactory form of treatment delivery.

The largest telepsychiatry trial pertaining to trans-cultural issues via videoconference involved a collective group of 61 asylum seekers, refugees and migrants (Mucic, 2010). Over the course of this study several bilingual therapists were used to administer therapy. Some of the languages used included Danish, Arabic, Farsi, Somali, Kurdish, Polish, Bosnian, Serbian, and Croatian. In congruence with previous research (Shore et al., 2008), Mucic (2010) found that the participants reported a high level of satisfaction with the videoconference-based services. Communication in the mother tongue was preferred to the use of an interpreter such as an assisted career or family member. Thus, these findings indicate that if available, some clients may benefit from access to bilingual therapists that are capable of interacting in their mother tongue. However, despite the array of studies on cultural and ethnic groups there are currently no large controlled trials that specifically investigate the efficacy and effectiveness of videoconferencing for cultural minorities (Yellowlees et al., 2008), hence further research is needed.

2.13.6 Depression

Mood disorders affect approximately 14.7% of the population (Alonso et al., 2004). Unfortunately however, only 36% of sufferers are likely to seek treatment and of those, 20.7% receive no treatment whatsoever (Alonso & Lepine, 2007). One of the primary reasons that clients do not receive treatment is because they live in locations that have limited or no psychological services, hence videoconferencing may provide a possible solution (Garcia-Lizana & Munoz-Mayorga, 2010). The diagnosis of depression via videoconference has been reported to yield results that are equivalent to in-person when using the Hamilton Depression Rating Scale (Kobak et al., 2004; 2008a) and the Montgomery-Asberg Depression Rating Scale (Kobak et al., 2008b). It is also possible to diagnose clients via asynchronous videoconferencing (Yellowlees et al., 2010), whereby a structured assessment is administered and recorded in-person by the primary care provider and reviewed later by a consulting specialist.

Although depression is one of the most common mental health disorders (Alonso et al., 2004), there are relatively few studies pertaining to depression and videoconference-based treatment. Alessi (2002) reported the details of a case study in which telepsychiatry was used to successfully treat a 13 year old female with depression and comorbid Oppositional Defiance Disorder over 12 sessions using a combination of medication, supportive psychotherapy and family therapy. Hilty, Servis, Nesbitt, and Hales (1999) reported the details of a 56 year-old woman who was successfully treated for depression using telepsychiatry. Furthermore, there are two RCT studies that have reported the use of a varied combination of medication, psychoeducation and brief supportive counselling to treat veterans suffering from depression via videoconference (Ruskin et al., 2004; Fortney et al., 2007). The findings from these studies suggest that treatment for depression via videoconference can be successful.

There are two psychiatry-based studies that have investigated the efficacy of videoconference-based treatment for veterans suffering from depression. Ruskin et al. (2004) randomised 119 participants between in-person and videoconference-based treatment and limited the number of sessions to eight during a six-month period. The treatment involved a combination of psychotropic medication, psychoeducation, and brief supportive counselling. The results indicated no significant differences between treatment groups. However, due to the variety of treatment methods used it remains

unclear as to which elements of the treatment were effective. In a larger study Fortney and colleagues (2006; 2007) selected three clinics to provide videoconference-based services (177 participants) and four clinics to provide in-person services (218 participants). A step-care model was used whereby the greater the severity of the presenting problem the greater the amount of mental health services provided. Both treatment outcomes and quality of life were measured and, like the findings of Ruskin et al. (2004), no significant differences were observed in clinical outcomes between conditions. However, further research needs to be conducted using standardised treatment protocols and on participant groups other than veterans before stronger conclusions can be made about the differences between the two media. Overall though, the research thus far regarding psychiatric services for the treatment of depression indicates that it can be successfully provided via videoconference.

Although a substantial amount of research exists regarding telepsychiatry and depression, there is a paucity of research into the treatment of depression using telepsychology interventions. One trial has been conducted on depression in children comparing CBT administered via videoconference to in-person (Nelson et al., 2003). Twenty-eight children were randomised between conditions and received a total of eight sessions. Interestingly, there was an interaction between group and time whereby participants in the videoconferencing condition showed a faster rate of improvement than those in the in-person condition, which suggests that for childhood depression it may be more efficacious to administer treatment via VC. However, as the authors noted, replication is needed before such claims can be legitimately asserted. Lazzari, Egan, and Rees (2010) conducted an uncontrolled pilot study of behavioural activation treatment for three older adults with depression. The results indicated that all three clients showed clinically significant and reliable decrease in depressive symptoms.

Garcia-Lizana and Munoz-Mayorga (2010) conducted a review of the literature on telemental health and depression and also concluded that although the research evidence thus far is insufficient, there is a strong hypothesis that videoconference-based treatment for depression is as effective as in-person. Hence, further research is needed using structured psychological interventions, targeted client groups and methodological designs implementing equivalence trial analyses. Egede et al. (2009) have begun a four year RCT telepsychology trial study for older adults with depression that aims to treat 224 participants using Behavioural Activation Therapy

over an 8-week period. However, additional research will still be needed involving other methods of psychotherapy and different client populations to demonstrate effectiveness.

2.13.7 Anxiety Disorders

As was briefly explored in chapter one Section 1.7.2, there are a variety of different anxiety disorders for which evidence-based treatments have been established. Available research pertaining to the treatment of these disorders via videoconference will be discussed below.

2.13.7.1 OCD

The first study specifically pertaining to OCD and videoconference-based interaction was conducted by Baer et al. (1995). They compared the inter-rater reliability of Yale-Brown Obsessive Compulsive Scale (Goodman et al., 1989), the Hamilton Depression Rating Scale (Hamilton, 1960) and the Hamilton Anxiety Rating Scale (Hamilton, 1959) via videoconference ($n=10$) to in-person ($n=16$). In the videoconferencing condition there was a rater at the remote site as well as a simultaneous rater in the room with the participant. The interclass correlation coefficient for all three scales was above .97 and there was no significant difference observed between conditions.

The first study to explore the treatment of OCD via videoconference was conducted by Himle et al. (2006), which involved the analysis of three participants treated via videoconference. The first participant was a 19 year-old female university student who presented with checking and repeating rituals pertaining to fear of harming others and had suffered with the problems for the prior 14 years. The second participant was a 29 year-old female who had for the prior four years suffered with fears of contamination and compulsive reassurance seeking. The third participant was a 39 year-old female who had suffered with collecting and hoarding compulsions for the previous 13 years prior to treatment. Himle et al. (2006) used a multiple-base line design implementing a 12-week manualised CBT intervention for OCD. Participant ratings of satisfaction and therapeutic alliance were high and the reduction in participant symptoms, as measured by the Yale-Brown Obsessive Compulsive Scale, ranged from 44% to 55%, which was similar to the rates of improvement observed for in-person conditions (Abramowitz, 1997). However, further research needs to be

conducted comparing in-person to videoconference-based treatment before stronger assertions can be made about if treatment for OCD via videoconference is as effective as in-person.

2.13.7.2 Eating Disorders

Several studies have been conducted investigating if eating disorders can be treated via videoconference, the most widely researched of which is Bulimia Nervosa (BN). Bakke et al. (2001) conducted the first case study demonstrating manualised CBT for the treatment of two female participants with BN via videoconference. The results indicated that the participants no longer reported engaging in binge/purging behaviour in the final four weeks of treatment and these gains were maintained at one-month follow-up. In a slightly larger case series design Simpson and colleagues (2005; 2006) provided semi-structured individualised treatment to six participants with BN and also observed significant reduction in participant symptomology, which was clinically significant for three of the participants three months following treatment. Building on the successes of prior case studies Mitchell et al. (2008) conducted a large scale RCT for the treatment of BN utilizing six doctoral level students to conduct the therapy for 128 participants recruited during a four year time period. The intervention used was the manual-based CBT treatment (Fairburn & Cooper, 1993) and involved 20 sessions delivered over 16-weeks. No significant differences were observed between the in-person and videoconferencing condition with regards to reduction in symptomology, therapeutic alliance and treatment retention. The study by Mitchell et al. (2008) is one of the most comprehensive telepsychology studies yet conducted and provides strong support for the implementation of manual-based treatments via videoconference.

The literature pertaining to the treatment of eating disorders via videoconference is not limited to BN. Simpson et al. (2003) reported on the use of videoconferencing for 12 participants with eating disorder not otherwise specified using a multidisciplinary approach encompassing both a psychologist and a nutritionist. Although several of the participants were still undergoing CBT treatment at the end of the study, anecdotal evidence was provided asserting that many of the participants' symptoms had reduced, their knowledge regarding nutrition had increased and in 84% of sessions the participants reported high levels of satisfaction with the technology.

The studies on eating disorders and videoconferencing indicate that the treatment for BN is as effective as in-person. However further research is needed to determine if these findings extend to anorexia and eating disorder not otherwise specified. Research is currently underway regarding the treatment of binge eating disorder via videoconference (Castenovo et al., 2011) and it is hoped that such research will expand scientific understanding.

2.13.7.3 Panic Disorder

A variety of studies have been conducted investigating videoconference-based mental health services for panic related disorders. Bouchard et al. (2000) were the first to report evidence of the successful treatment of panic with agoraphobia (PA) via videoconferencing. Their study included eight participants treated via videoconference using a manualised CBT approach outlined by Clark and Salkovskis (1987). The results indicated a reduction in participant symptoms and a high level of therapeutic alliance and satisfaction. However, the study by Bouchard et al. (2000) did not include a control condition and the participant group was too small to generalise firm conclusions regarding the efficacy of psychotherapy via videoconference for panic disorder.

Building on their previous research (Bouchard et al., 2000), Bouchard et al. (2004) conducted a larger trial comparing a manualised CBT treatment for PA via videoconference ($n = 11$) to in-person ($n = 10$). The measures used were the Cognitive Questionnaire (Chambless, Caputo, Bright, & Gallagher, 1984) and Mobility Inventory for Agoraphobia (Chambless, Caputo, Jasin, Gracely, & Williams, 1985), and the Working Alliance Inventory (Horvath & Greenberg, 1989). The results indicated that in the videoconferencing condition 81% of participants were panic free at post-treatment and 91% at 6-month follow-up. These findings were not significantly different from the results in the in-person group. Furthermore, there were also no significant differences in the ratings of the working alliance. However, despite these encouraging findings the study lacked random assignment to condition, hence further research is still needed.

In an Australian based study Cowain (2001) reported the details of a single case study of a 38-yr old woman who was successfully treated with 12 sessions of combined CBT and medication management via videoconference. In this case report Cowain (2001) noted several issues that are relevant to the treatment of psychological

disorders via videoconference. First, during some sessions other people walked into the participant's treatment room despite an 'occupied' sign on the door, raising issues pertaining to the potential lack of privacy via videoconference. Second, the participant was concerned about engaging in exposure activities when she was 300km away from the therapist with no one available to help her if she had a full panic attack. Third, the therapist had to make greater use of verbal support to maintain rapport and convey support given the lack of physical presence. These issues highlight that although treatment can be provided via videoconference, there are differences between in-person and videoconference-based treatment that need to be compensated and/or adjusted for. Nevertheless, the research thus far indicates that treatment via videoconference may result in outcomes comparative to in-person.

2.13.7.4 Post Traumatic Stress Disorder

The treatment of PTSD via videoconference has been researched in several studies. Porcari, et al (2009) recruited 20 veterans and conducted an assessment of their symptoms using the Clinician Administered PTSD Scale (Weathers, Ruscio, & Keane, 1999) in-person and via videoconference. The correlations for the various subscales between conditions ranged from .74 to .92, indicating a strong relationship between the methods of assessment. Furthermore, the confidence interval for the scores obtained in the videoconferencing condition was within the bounds of the in-person condition, which suggest statistical equivalence.

As noted above in section 2.11.2, Deitsch, Frueh, and Santos (2000) were the first to specifically address PTSD via videoconference. This initial case report described the one off use of videoconferencing to interact with four veterans receiving group therapy. The participants involved reported that they felt comfortable via the technology and that it was as helpful to them as they would expect an in-person interaction to be. Further case reports began to emerge in the literature, such as that by Shore and Manson (2004a; 2004b) who reported the details of treating American Indians with PTSD via videoconference. Other examples include that by Hassjia and Gray (2009) on the use of exposure therapy for motor vehicle accident-related PTSD, Tuerk, Yoder, Ruggiero, Gros, and Acierno (2010) on the use of prolonged exposure therapy for 12 combat-related PTSD, Gos, Kimberly, Martha, Ruggiero, and Acierno (2011) who reported the emergency treatment of a suicidal veteran and Hassjia and Gray (2011) who reported the treatment of 15 participants with domestic violence

and/or rape related PTSD. These case studies and preliminary trials indicate that treatment of PTSD is feasible and of potential benefit to the clients.

In the context of concurrent larger studies, some research has been conducted specifically investigating the competence of therapists administering manualised treatment via videoconference compared to in-person. Frueh, Monnier, Grubaugh, Elhi et al. (2007) assessed if there were any significant differences in competence, the structuring of sessions, implementing clinical activities, providing feedback, developing rapport and conveying empathy between in-person and videoconference-based therapy. Their findings indicated that the therapist's competence and adherence to the CBT protocol was not compromised via videoconference. However, their study only included one therapist, which limited the generalizability of the findings. In subsequent research Morland, Green et al. (2011) compared the competence of five doctoral students who administered psychotherapy via videoconference and in-person within the context of a non-inferiority trial involving group-based anger management treatment for PTSD. Like previous findings, no significant differences between conditions were observed.

Larger studies have also been conducted addressing the treatment of PTSD within the context of videoconferencing. Morland, Pierce, and Wong (2004) recruited 20 participants with PTSD and randomly assigned them to either a coping skills group via videoconference or a traditional in-person treatment. No significant differences were observed between conditions with regards to participant satisfaction or information retention, which further suggests that psychotherapy for PTSD via videoconference is both feasible and acceptable to clients. Preliminary evidence for non-inferiority of videoconference-based treatment compared to in-person was provided by Frueh, Monnier, Grubaugh, Hammer, and Knapp (2007). This study involved 38 participants randomised to in-person or videoconference-based group therapy for PTSD. Also in line with prior research, the treatment outcomes obtained via videoconference were not found to be inferior to what was obtained in-person. In one of the largest videoconferencing trials yet Morland et al. (2010) conducted a study involving 125 participants with PTSD randomly assigned to either in-person or videoconference-based group therapy for anger management. Similarly, the findings indicated that the clinical outcomes obtained via videoconference were not inferior to what are obtained in-person.

Much of the research that has been conducted regarding PTSD and videoconference has involved group-based psychotherapy. Therefore, Gos, Strachen et al. (2011) are currently investigating the differences of individual treatment for PTSD between in-person and videoconference within the context of a non-inferiority trial. But at present, the current collective findings in the literature pertaining to PTSD indicate that it can be effectively administered via videoconference and the clinical outcomes are not inferior to what is obtained in-person.

2.14 Specific Challenges To Telemental Health and RCT's

Research involving RCT's to investigate the efficacy and effectiveness of telemental health has been limited because the technology poses specific challenges to the design. First, an ideal large scale RCT telemental health project involving multiple locations is likely to encompass a wide range of videoconferencing technology thus the quality of the transmissions is likely to vary. The more variation there is in the technology the harder it is to determine which forms of videoconferencing are effective. Second, when using rural and remote populations it is less likely that homogenous client groups can be obtained because there are smaller participant pools to draw from. The less homogenous the clients within groups the more likely it is that treatment effects will be obscured. Third, if a metropolitan in-person client group is used as the control condition and a remote rural client group is used as the experimental condition then differences may reflect differences between client populations rather than differences between the media used to provide treatment. This may be particularly relevant when assessing client satisfaction. Rural clients may report high satisfaction with a service because they do not need to travel to obtain the service. This can be overcome by using clients from the same population location.

Fourth, although all RCT's require a substantial amount of money and human resources, a telemental health project requires considerably more funds than might typically be warranted. Purchasing and installing the technology in multiple locations is going to be an initial expense. Administration and ongoing servicing of the devices is likely to be needed. The more locations that are used the more likely it is that the findings of the study will generalise to the wider population. However, if, for example 100 locations are rented for remote clinical use but only two clients are available and willing to participate in each area then it would be an inefficient use of resources compared to a metropolitan study that requires only one central location for both

administration and data collection. An ideal large RCT would involve multiple clinicians, which would further add to the cost and resources needed.

A fifth issue to consider is the development of community support for research involvement. It may take several months or even years before remote communities build confidence in in-person services let alone time-limited remote services. This issue may be of particular relevance to remote Indigenous Australian and Torres Strait Islander communities that have had poor prior experiences with government funds being allocated to services that cease once funding has ended (Pink & Allbon, 2008). Raising community awareness and support for the research can also add to the cost of the research. However, it is important to find creative ways to overcome these barriers so that important questions about the efficacy and effectiveness of telemental health can be scientifically addressed.

2.15 Key Issues Not Sufficiently Addressed in the Literature

Despite the research that has been conducted regarding videoconference-based treatment, it is a relatively new field. Consequently there are several conditions that have little, if any, research supporting treatment via videoconference. Some of the disorders that have not been researched include social anxiety, GAD, health anxiety related conditions and illicit drug use. Although some anecdotal evidence has been reported regarding the treatment of psychotic conditions via videoconference (Magaletta, Fagan, & Peyrot, 2000), not enough research has been done in this area to draw any conclusions. To the author's knowledge no RCT's exist comparing videoconference-based mental health services to in-person regarding ethnic minorities, psychotic conditions, emergency mental health, involuntary commitment or incarcerated clients. However, accessing these client groups in sufficient numbers in a sparsely populated location, such as Western Australia, represents a substantial logistical problem. Obtaining the necessary controlled and restrictive client groups not only requires considerable funds it also requires a large amount of human resources. This has been achieved regarding the treatment of Bulimia Nervosa via videoconference (Mitchell et al., 2008) and is currently being employed for the treatment of depression in an older adult group (Egede et al., 2009) and the treatment of PTSD in veterans (Gross et al., 2011). But these studies are primarily focused on the efficacy of treatment via videoconference therefore further research is needed on the effectiveness of empirically supported CBT treatments via videoconference using

‘real world’ practices involving broad comorbid diagnostic client groups. At present there are few studies that have specifically investigated the effectiveness of CBT via videoconference in such settings. Hence, it is unclear if empirically validated in-person treatments result in comparable clinical outcomes in the context of a mixed-comorbid diagnosis client group.

Another issue that has not been sufficiently addressed in the literature pertains to the therapeutic alliance. Although several lines of research indicate that the therapeutic alliance is not compromised via videoconference (Bouchard et al., 2004; Himle et al., 2006; Simpson et al., 2005), research does exist indicating that clinicians may not have favourable perceptions of the therapeutic alliance via videoconference in comparison to in-person (Rees & Stone, 2005). Hence, future research should measure both client and clinician perceptions of therapeutic alliance and examine any differences between the in-person and videoconference ratings. As noted earlier, to the author’s knowledge no study or anecdotal evidence has reported the use of videoconferencing technology to address GAD or hypochondriasis. Therefore if the opportunity to treat either of these conditions via videoconference arises the details should be reported. Finally, as noted above, several lines of anecdotal evidence (Himle et al., 2006; Simpson et al., 2005) indicate that some aspects of videoconference-based treatment may be more beneficial and acceptable to some clients than in-person services. Therefore any further anecdotal evidence regarding the benefits of videoconference-based treatment for psychological condition should be reported and systematically investigated.

2.16 Chapter Summary

There is a substantial need for specialised mental health services in rural and remote communities. One way of addressing the needs of this client group is by providing mental health services via telemental health. There are a variety of different technologies that can be used to provide remote communication, such as telephone, computer-aided psychotherapy, virtual reality, text-based therapy, videophones and videoconferencing. Each technology has strengths and weaknesses, however the technology that has the greatest similarity to in-person interaction is videoconferencing. Throughout chapter one it was argued that CBT is an empirically validated form of in-person treatment. Hence, given the similarity between in-person

and videoconference-based interaction research should be conducted to determine if clinical treatment via videoconference results in similar outcomes to in-person.

Videoconference-based mental health treatment can be used to provide psycho-education, individual therapy and group therapy in a variety of clinical settings. Strong empirical evidence exists indicating that there is no significant difference between in-person and videoconference-based diagnosis of mental health conditions. The literature also indicates that services via videoconference are cost effective and that the majority of participants report high levels of satisfaction and a strong therapeutic alliance. The literature pertaining to the treatment of specific populations via videoconference indicates that it can be successfully used to address the needs of the older adult and children/adolescents populations but more research is needed to determine the effectiveness for Axis-I disorders in the adult population.

The literature review above indicates that the next step to take in the research is to extend both prior and ongoing efficacy based research by investigating the effectiveness of videoconference-based CBT in a diverse client population. This is the primary aim of study one, which is presented in chapter four. Further research is also needed investigating both clinician and client ratings of the therapeutic alliance via videoconference, which is addressed in study one. Finally, prior research has indicated that some clients prefer treatment via videoconference and that there may be unique benefits to interacting via the technology. Hence, this issue is systematically explored in greater detail in study two chapter five.

Chapter 3: The Rationale And Methodology For Study One

This chapter provides the theoretical and methodological rationale for study one. The chapter will begin by building on the literature reviewed in chapters one and two to provide the theoretical rationale for examining the differences between in-person and videoconference-based CBT. This review will also highlight the need to conduct videoconferencing research in a real-world diverse clinical population. Following this a discussion will be provided exploring the methodological designs appropriate for analysing clinical change. This discussion will highlight the utility of conducting a RCT in which clinical symptoms are measured at pre, post and 6-weeks following treatment. A description of the aims of the study, research questions and hypotheses will then be provided. There are several different statistical approaches that could be used to address the proposed aims, which include Analysis of Variance (ANOVA), Multilevel Linear Modelling (MLM) and non-inferiority analysis. Each of these statistical approaches will be evaluated in turn to determine which approach is the most suitable for addressing the aims of this study.

3.1: Theoretical Rationale

CBT has received empirical validation for a variety of mental health disorders and is the treatment of choice for this study. Meta-analyses have indicated that CBT provided in-person can be used to successfully treat disorders such as depression (Driessen et al., 2010), OCD (Rosa-Alcazar et al., 2008), GAD (Mitte, 2005a), social phobia (Taylor, 1996) panic disorder (Mitte, 2005b) and PTSD (Bisson et al., 2007). Strong support provided by RCTs also indicates that CBT can be effective in treating anxiety (Sorensen et al., 2011) and client groups comprised of a mixed array of diagnoses (McEvoy & Nathan, 2007). CBT has also received empirical support regarding its use with real-world clinical populations for disorders such as depression (Merrill et al., 2003), OCD (Franklin et al., 2000), GAD (Ost & Breitholtz, 2000), social phobia (Lincoln et al., 2003), panic disorder (Addis et al., 2006) and PTSD (Foa et al., 2005). Thus, CBT provided in-person is the most empirically validated form of psychotherapy and therefore provides a ‘gold standard’ against which interventions via videoconferencing can be judged.

Research exists indicating that psychological services for rural and remote populations provided via videoconference can be more cost effective than treatments provided in-person (Jong, 2004; Mielonen et al., 2000; Shore et al., 2007; Smith et al., 2007). The research literature further indicates that on average participants are highly satisfied with the services provided via videoconference (Monnier, Knapp, & Frueh, 2003; Richardson et al., 2009). A substantial body of research also exists indicating that psychological assessment and diagnosis via videoconference results in comparable outcomes to in-person (see Grady et al., 2011 for a review). Some evidence exists indicating that psychological treatment via videoconference under controlled conditions involving restrictive diagnostic criteria and structured manualised treatments can be efficacious (Bouchard et al., 2004; Himle et al., 2006; Mitchell et al., 2008). However, there is limited research demonstrating the effectiveness of psychological interventions via videoconference involving diverse diagnostic client populations and individualised manual-based treatments. Further research is needed to address this gap in the literature.

Another issue that needs to be considered in the context of this study is quality of life. Prior research has indicated that when CBT is successful in reducing the symptoms of a psychological disorder, clients typically experience a concurrent increase in quality of life (Diefenbach et al., 2007). However, it is important to note that although emotional functioning and quality of life can change simultaneously, it is possible for a client's emotional functioning to improve but not their quality of life or for their quality of life to improve but not their emotional functioning (Craske et al., 2007). Changes in quality of life as a result of treatment administered via digital media have been addressed in some contexts (Vernmark et al., 2010), but research specifically pertaining to videoconferencing and quality of life is limited. Hence further research is recommended to address this limitation in the literature.

Although client satisfaction with videoconference-based interactions has been addressed in the literature (Richardson et al., 2009), Australian-based research regarding client satisfaction via videoconference remains limited. Therefore further research comparing the satisfaction of participants who receive psychotherapy via videoconference to those who receive in-person services is warranted with an Australian population.

Several studies have indicated that the therapeutic alliance via videoconference is not compromised via videoconference (Bouchard et al., 2004;

Himle et al., 2006; Simpson et al., 2005). However, Rees and Stone (2005) observed in their study that clinicians are likely to perceive the therapeutic alliance developed in-person as stronger than when developed via videoconference. Hence, further research is needed to investigate differences between videoconference-based and in-person clinician perceptions of the therapeutic alliance.

The above review indicates that further research pertaining to videoconferencing is needed regarding treatment outcomes, quality of life, client satisfaction and working alliance in a diverse clinical population. In order to achieve this it will be necessary to compare the outcomes of an already empirically validated in-person treatment to the outcomes obtained via videoconference. By making a direct comparison of the same empirically validated treatment administered either in-person or via videoconference the effect of the novel media on clinical outcomes can be investigated.

In summary, there is a need for more remote mental health services and videoconferencing has the potential to meet the needs of remote clients. Previous research has indicated that providing mental health services via videoconference is feasible, can be cost effective and the accuracy of clinical diagnosis is not compromised via the media. However, further research is needed comparing the clinical outcomes of an empirically validated in-person treatment to the outcomes of that same intervention administered via videoconference. Making a direct comparison between treatment modalities will allow assertions to be made regarding the appropriateness of videoconferencing technology to provide mental health treatment.

3.2: Methodological Rationale

There are several methodological designs that can be used to investigate change in a clinical psychology context. This section begins by discussing the use of a pre to post-treatment design. This is then followed by a discussion of the improvements on this basic design, such as the inclusion of a control or comparison group, randomisation and the inclusion of follow-up assessment.

One of the most basic designs that can be used to investigate change is the pre to post-treatment design. This involves measuring participants before and after treatment on an outcome variable that is expected to change as a result of treatment. The utility of this approach is that it enables the researcher to explore if the target variable, typically client symptoms, reduces in accordance with the administration of

the treatment. However, this design has poor internal validity as it is not able to rule out if the change in the outcome variable is due to the intervention or extraneous factors, such as history, maturation and/or regression to the mean (Shadish, Cook, & Campbell, 2002).

Alternatively, an additional control group or placebo group can be added in order to rule out extraneous factors as possible causes of change. A control group can take the form of an active treatment that is different from the experimental treatment or allocation of participants to a waitlist where the control group receive the same services as the intervention group after an allotted time has passed. A placebo group involves administering an intervention that provides the non-specific 'basic ingredients' of the treatment intervention but not the elements of the intervention under study (Nathan et al., 2000). For example, in a drug trial the placebo condition may be a sugar pill whereas in a psychotherapy trial it may be supportive counselling.

Clarke (1995) argues that if a plethora of research already exists indicating the efficacy and effectiveness of a given intervention, such is the case with CBT, then it is unethical to withhold treatment from a participant by allocating them to a waitlist control condition. It is not however regarded as unethical to randomise a participant to a placebo therapy/supportive counselling condition, provided that the research is necessary, because it is expected that the participant will still receive some therapeutic benefit through the non-specific factors that are believed to influence clinical outcome (Nathan et al., 2000). With regards to a waitlist control group, it is not uncommon for participants to drop out of the study and seek treatment elsewhere (Clarke, 1995). Consequently, participants that remain in the waitlist control group could have qualities that differentiate them from those in the intervention group. Clarke (1995) argues that a usual care control condition (the standard treatment the participants would typically get), or an active treatment control condition has the greatest ecological validity and is preferable to a waitlist control group. Although the addition of a control group can help rule out extraneous factors, such a design can only be considered quasi-experimental if participants are not randomly allocated to condition.

When participants are not randomly allocated to conditions there is a chance that the two groups are not equally matched on all relevant variables. If the participants are not matched across groups then it is a threat to the internal validity of the study. Conversely however, when participants are randomly allocated to conditions they are more likely to be equivalent on both pre-test scores and other

variables that may affect the outcome. Hence a RCT design is regarded as the ‘gold standard’ scientific method for establishing an intervention effect (Altman et al., 2001).

Although a RCT design can be used to establish intervention effects, one issue that needs considering is if the intervention has lasting effects. That is, does the intervention result in a reduction in symptoms that persists after the intervention has ended? In order to address this issue it is necessary to measure participants again at a specified time after the intervention has elapsed. Many treatment studies use 4-6 week follow-up time periods (Anderson & Rees, 2007; Himle et al., 2006). Doing so allows the researcher to assess the stability of the intervention’s effect over time. When the time-span between the ending of treatment and follow-up is longer stronger assertions can be made regarding the effect of treatment over time.

One of the main aims of employing a RCT design is to reduce systematic error in the research design (Altman, et al., 2001). When a RCT design is not implemented optimally and/or the details of the RCT are not sufficiently reported in the literature systematic error becomes a greater concern. The Consolidated Standards of Reporting Trials (CONSORT) guidelines were developed and subsequently revised in order to improve the reporting of RCT designs in the literature (Altman et al., 2001; Moher, Schulz, & Altman, 2001; Piaggio, Elbourne, Altman, Pocock, & Evans, 2006). The degree to which the CONSORT guidelines were adhered to in study one is discussed in section 4.3.7.

Despite the utility of RCT designs for determining intervention effects, RCT’s are not without their challenges and limitation (Persons & Silberschatz, 1998). The employment of a RCT design typically requires a substantial amount of time to plan the project; including reading prior literature so that it is relevant to current research, taking steps to ensure that the CONSORT guidelines are met and obtaining approval from an ethics committee before carrying out the research. An extended amount of time is needed to recruit participants, implement the clinical measures, administer the interventions and allow for sufficient time to pass for follow-up assessments. In addition, time is also needed to conduct the statistical analyses and to report the research findings. Hence RCT’s are labour intensive and costly. The employment of RCT’s should also be considered carefully because they are not appropriate for all research questions (Persons & Silberschatz, 1998). For example, RCT’s are unable to provide information on an individual client’s personal experiences with a treatment

intervention, they are not suitable for the reporting of or expanding on initial anecdotal findings, and they provide little information on how the intervention might affect participants from difficult cultural and social circumstances. However, when there is sufficient prior research justifying the use of a RCT, as is the case with mental health services via videoconference, and the research questions are both specific and relevant then a RCT can be appropriate.

Ethical issues also arise for RCT pertaining to telemental health. For example, it could be argued that forcing half of the clients in a rural participant group to travel to a metropolitan treatment centre would be depriving them of the right to receive the potential benefits of remote services allocated to the experimental videoconference-based group. This ethical issue can be overcome by using clinicians that reside in the same location as those of the participants, thus making the burden on the clients in both conditions equal. A second ethical issue arises when the clinician is also a primary investigator. During the course of treatment there may be moments in which the clinician thinks in their professional opinion that it is going to be more beneficial for the client to explore issues and provide treatment in a manner that is incongruent with the prescribed treatment. Yet this same clinician, as the researcher, must make clinical decisions that are in keeping with the research and the collecting of accurate meaningful data. For example, it may be apparent to the clinician that a severely depressed client may benefit from a referral to a psychiatrist for medication management in addition to the psychotherapy being provided during the study. But by making such a referral the client may no longer meet the eligibility criteria for the study. Consequently the clinician will be in a situation whereby they have to continue providing treatment for the allocated number of sessions but as a researcher the post-treatment data cannot be included in the study. This balancing act between the needs of the clinical situation and the needs of the research can be navigated through frequent clinical supervision.

In summary, the methodological design that will be used in study one is a RCT design with an active treatment condition congruent with the CONSORT guidelines. This design is appropriate for addressing the theoretical rationale of this study. The use of a RCT design with an active treatment condition will allow a direct comparison between the clinical outcomes obtained in-person to that obtained via videoconference.

3.3: Aims

The aim of one is to investigate the effectiveness of CBT administered via videoconference compared to CBT administered in-person for a range of psychological disorders. This study aims to determine if CBT administered via videoconference results in a reduction in participant symptoms of depression, anxiety and stress, and an improvement in quality of life that is comparable to what is achieved when CBT is administered in-person. In addition, this study aims to determine whether the clinical outcomes are maintained once treatment has ended. In order to provide direct applicability to real-world clinical practice a clinical group characterised by a mixture of diagnoses and comorbid disorders will be used. Furthermore, although the intervention used will be based on manualised CBT treatment specific to the participant's primary presenting condition, it will be individually tailored to suit the unique needs of the participant, as is often done in clinical practice (Persons & Silberschatz, 1998). The purpose of this is to increase the ecological validity of the study. This research also aims to investigate if the quality of the therapeutic alliance differs between videoconference-based and in-person treatment. It will be important to investigate both participant and therapist perceptions of the therapeutic alliance. These aims lead to a set of research questions, which are listed below.

3.4: Research Questions

There are six research questions that are relevant to this study, each of which pertain to a real world Australian clinical population.

1. Does CBT administered via videoconference result in different clinical outcomes than when administered in-person? In the context of this study the clinical outcomes pertain to depression, anxiety, stress, and quality of life measured at pre, post and 6-weeks follow-up.
2. Is there a statistically significant difference between the quality of the therapeutic alliance reported by participants receiving treatment via videoconference and those receiving in-person services?
3. Does the clinician perceive the quality of the therapeutic alliance to be poorer with participants treated via videoconference than participants treated in-person?

4. Is there any difference between participant ratings of satisfaction when receiving CBT treatment via videoconference than in-person?
5. Are participants who receive treatment via videoconference satisfied with the technology used to facilitate the intervention?
6. Is there a difference between participant perceptions of treatment credibility when the intervention is provided via videoconference than when provided in-person?
- 7.

3.5: Study Hypotheses

Hypothesis Pertaining To Research Question One

In order to evaluate if CBT via videoconference results in different outcomes to in-person treatment it will be important to explore the effect of time (pre, post and follow-up) and condition (videoconference and in-person) on participant symptoms and quality of life. The hypotheses are arranged in numerical order and pertain to depression (hypotheses 1-5), anxiety (hypotheses 6-10), stress (hypotheses 11-15), quality of life (hypotheses 16-20) and the disorder specific measures (hypotheses 21-22). Hypotheses 6-22 are identical to those presented in hypotheses 1-5 except that they respectively pertain to depression, anxiety, stress, quality of life, and the disorder specific measures (the rationale for implementing disorder specific measures is covered in Section 3.6.1.3). In order to reduce repetition only the first instance of a hypothesis is described in full. The organisations of the identical hypotheses are presented in Tables 1-3.

Table 1
The Organisation of Main Hypotheses

| | Hypotheses Pertaining To | | |
|-----------------|--------------------------|-----------|-----------------|
| | Time | Condition | Non-inferiority |
| Depression | 1 | 2 | 5 |
| Anxiety | 6 | 7 | 10 |
| Stress | 11 | 12 | 15 |
| Quality of Life | 16 | 17 | 20 |

Table 2

The Organisation of Within Conditions Hypotheses

| | Pre to Post | | Post to Follow-up | | Pre to Follow-up | |
|-----------------|-------------|-------|-------------------|-------|------------------|-------|
| | In-person | Video | In-person | Video | In-person | Video |
| Depression | 1a | 1b | 1c | 1d | 1e | 1f |
| Anxiety | 6a | 6b | 6c | 6d | 6e | 6f |
| Stress | 11a | 11b | 11c | 11d | 11e | 11f |
| Quality of Life | 16a | 16b | 16c | 16d | 16 | 16f |

Table 3

The Organisation of Reliable Change & Clinically Significant Change Hypotheses

| | Reliable Change | | Clinically Significant Change | |
|----------------------------|-----------------|------------------|-------------------------------|------------------|
| | Pre to Post | Pre to Follow-up | Pre to Post | Pre to Follow-up |
| Depression | 3a | 3b | 4a | 4b |
| Anxiety | 8a | 8b | 9a | 9c |
| Stress | 13a | 13b | 14a | 14b |
| Quality of Life | 18a | 18b | 19a | 19b |
| Disorder specific measures | 21a | 21b | 22a | 22b |

*Hypotheses 1-5: Depression**Hypothesis 1*

Before a comparison is made between videoconference and in-person treatment outcomes, it must first be determined if treatment was effective at reducing symptoms of depression in each condition across time.

It is hypothesised that there will be a significant main effect for time (pre, post and follow-up) with regards to participant symptoms of depression across conditions.

This main effect is expected to correspond with a reduction in participant symptoms of depression, as measured by the depression sub-scale of the Depression Anxiety Stress Scale (DASS, see Section 4.1.5.2.1 for details). It is also necessary to investigate differences in the reduction of depression between the time points (pre to post-treatment, post-treatment to follow-up and from pre-treatment to follow-up) for

each condition (videoconference and in-person). Hence, Hypotheses 1a to 1f are offered.

Hypothesis 1a

It is hypothesised that participant ratings of depression (as measured by the depression sub-scale of the DASS) at post treatment will be significantly lower than at pre treatment.

Hypothesis 1b

It is hypothesised that participant ratings of depression (as measured by the depression sub-scale of the DASS) at post treatment will be significantly lower than at pre treatment.

Hypothesis 1c

It is hypothesised that participant ratings of depression (as measured by the depression sub-scale of the DASS) at follow-up will be significantly lower than at post treatment.

Hypothesis 1d

It is hypothesised that participant ratings of depression (as measured by the depression sub-scale of the DASS) at follow-up will be significantly lower than at post treatment.

Hypothesis 1e

It is hypothesised that participant ratings of depression (as measured by the depression sub-scale of the DASS) at follow-up will be significantly lower than at pre-treatment.

Hypothesis 1f

It is hypothesised that participant ratings of depression (as measured by the depression sub-scale of the DASS) at follow-up will be significantly lower than at pre-treatment.

Hypothesis 2

As noted above, previous research regarding mental health services via videoconference has failed to reject the null hypothesis that there is no significant difference in clinical outcomes between in-person and videoconference-based treatment. Furthermore, the effect sizes in previous research comparing videoconference to in-person treatment have been small, which indicates that there is little difference in treatment outcomes (Grady et al., 2011). However, an impractical sample size is needed to directly test a null-hypothesis (Tabachnick & Fidell 2007) therefore the alternative hypothesis is offered.

It is hypothesised that there will be a significant main effect for condition (in-person and videoconference) with regards to participant symptoms of depression across time, as measured on the depression subscale of the DASS. It is hypothesised that the reduction in symptoms of depression observed in the in-person condition will be superior to that observed in the videoconferencing condition.

Hypothesis 3a

To further compare clinical outcomes of in-person to videoconference reliable change will be calculated in both conditions and compared. The details and rationale behind the use of calculating reliable change is covered below in Section 3.6.1.3. Most of the prior research on CBT via videoconference has indicated little difference with regards to treatment outcomes (Bouchard et al., 2004; Himle et al., 2006; Mitchell et al., 2008). However, as noted earlier it is impractical to test the null-hypothesis. Hence the alternative hypothesis is offered below.

It is hypothesised that significantly more participants in the in-person condition will meet the criteria for reliable change than in the videoconferencing condition from pre to post-treatment.

Hypothesis 3b

Hypothesis 3b is identical to hypothesis 3a except that it pertains to the change in depression scores from pre-treatment to follow-up.

It is hypothesised that significantly more participants in the in-person condition will meet the criteria for reliable change than in the videoconferencing condition from pre-treatment to follow-up.

Hypothesis 4a

In a similar fashion to hypothesis 3a, participant rating of depression will be analysed to determine if they meet the criteria for clinically significant change. The details and rationale behind the use of calculating reliable change is covered below in Section 3.6.1.3.

It is hypothesised that significantly more participants in the in-person condition will meet the criteria for clinically significant change than in the videoconferencing condition from pre to post-treatment.

Hypothesis 4b

As was the case with hypothesis 3b, hypothesis 4b pertains to the change in depression scores from pre-treatment to follow-up.

It is hypothesised that significantly more participants in the in-person condition will meet the criteria for clinically significant change than in the videoconferencing condition from pre-treatment to follow-up.

Hypothesis 5

Given that prior research (Grady et al., 2011; Richardson, 2009; Simpson, 2009) indicates that condition is unlikely to be a significant predictor of clinical outcomes, an additional hypothesis is offered pertaining to depression in the context of research question one. If hypothesis 2 is not supported and condition is not a significant indicator of depression scores across time then it will be necessary to investigate if treatment via videoconference is inferior to treatment in-person. An explanation of significance testing in the context of examining inferiority and a discussion of its use in the context of this study is provided below in Section 3.6.1.2.

It is hypothesised that treatment via videoconference is not inferior to treatment conducted in-person, as indicated by changes in symptoms of participant depression across time (pre, post and follow-up).

Hypotheses 6-20: Anxiety, Stress & Quality of Life

Hypotheses 6-10 are identical to hypotheses 1-5 except that they pertain to symptoms of anxiety as measured by the anxiety subscale of the DASS. Hypotheses 11-15 are identical to hypotheses 1-5 except that they pertain to symptoms of anxiety as measured by the stress subscale of the DASS. Hypotheses 16-20 are identical to hypotheses 1-5 except that they are reversed and pertain to quality of life as measured by the Quality of Life and Enjoyment Questionnaire (QLES-Q, see Section 4.1.5.2.2 for further details). The reason hypotheses 16-20 are reversed is because it is expected that quality of life increases as a result of treatment whereas participant symptoms are expected to decrease as a result of treatment.

Hypotheses 21a-22b: Disorder Specific Measures

The above hypotheses 1-20 refer to global symptoms of depression, anxiety, stress and quality of life. However, given that CBT can be tailored to address the disorder specific symptoms that a participant presents with, global measures might not necessarily capture clinical change with the same degree of precision as a disorder specific measure. Therefore, in order to fully capture the effect of CBT on participant symptoms it may be advantageous to administer disorder specific measures for each participant. Unfortunately though, when disorder specific measures are used it is no longer possible to directly aggregate participant scores across a condition into a meaningful unit of analysis. However, reliable change and clinical significance can be calculated for each disorder specific measure for each participant, which results in a binary outcome of either meeting the criteria or not. This binary data can then be used to compare the number of participants who meet the respective criteria in either condition. Thus hypotheses 21a to 22b are offered. As noted above in Table 3, hypotheses 21a to 22b are identical to hypotheses 3a to 4b except that they pertain to the disorder specific measures.

Hypothesis (23) Pertaining to Research Question Two

To address research question two participant ratings of the therapeutic alliance in the in-person and videoconferencing conditions will be compared. Given the limited research on the proposed participant group a non-directional hypothesis is offered.

It is hypothesised that the therapeutic alliance established via videoconference is significantly different from when treatment is administered in-person.

Hypothesis (24) Pertaining to Research Question Three

In order to address research question three therapist ratings of the therapeutic alliance in the in-person and videoconferencing conditions will be compared. Previous research suggests that psychologists may have a tendency to perceive the therapeutic alliance via videoconference as poorer than what is established in-person (Rees & Stone, 2005).

It is hypothesised that the clinician in study one will rate the therapeutic alliance established with participants in the videoconferencing condition as significantly poorer than in the in-person condition.

Hypothesis (25) Pertaining to Research Question Four

In order to address research question four participant ratings of satisfaction in the in-person and videoconferencing condition will be compared. Although much of the prior research indicates that participants find videoconferencing services to be satisfactory (Cluver et al., 2005; Ruskin et al., 2004), some studies have not observed favourable results (Rohland et al., 2000; Simpson et al., 2001). Therefore a non-directional hypothesis is offered.

It is hypothesised that the level of satisfaction reported by participants in the videoconferencing condition will be significantly different than what is reported by participants in the in-person condition.

Hypothesis (26) Pertaining To Research Question Five

Previous research has indicated that participant satisfaction with videoconferencing services is typically high (Richardson et al., 2009; Simpson, 2009). Prior estimates (Yip, Mackenzie, & Chan, 2002) indicate that the average satisfaction rating is 80%.

Therefore it is hypothesised that participant satisfaction regarding the use of videoconferencing technology in this study will be 80% or above.

Hypothesis (27) Pertaining to Research Question Six

In order to address research question six participant perceptions of treatment credibility in the in-person and videoconferencing conditions will be compared. Given the lack of literature specifically pertaining to participant perceptions of treatment credibility via videoconference a non-directional hypothesis is offered.

It is hypothesised that the ratings of treatment credibility given by participants in the videoconferencing condition will be significantly different from the ratings given by participants in the in-person condition.

There are a variety of different methods and statistical approaches that can be used to address the above research questions and hypotheses. However, not all approaches are equally suitable and some methodological approaches may provide a greater degree of scientific explanatory power than others. Hence, the rationale for the use of each statistical design associated with each research question is provided below.

3.6: Rationale For Statistical Design

The central research question of study one is “Does CBT administered via videoconference result in significantly different clinical outcomes than when administered in-person?”. This section of the chapter will explore the rationale behind the use of the statistical techniques that will be used to address research questions 1-6. The section will begin by exploring some of the possible statistical methods that could be used to statistically address research question one. This is then followed by a brief discussion of the statistical rationale underpinning the analysis pertaining to research

questions two to six. Section 3.6 will conclude with a summary on the statistical rationale and its relationship to the methodological design.

3.6.1: Rationale For The Statistical Methods Used To Address Research

Question One

There is considerable debate on how best to analyse independent samples across multiple time points. The statistical methods that will be explored below will include Analysis of Variance (ANOVA) with planned comparisons, Multilevel Linear Modelling (MLM) and a non-inferiority trial. Following this a brief discussion will be provided regarding the utility of analysing reliable change and clinical significance in clinical outcome studies.

3.6.1.1: ANOVA With Planned Comparisons

The first approach to be discussed is a mixed factorial 2x3 repeated measures ANOVA with planned comparisons. The design of a 2x3 mixed factorial repeated measures ANOVA is displayed in Table 4. The first factor, time, is a repeated measures factor with measurements made at pre, post and follow-up. The second factor, condition, is an independent factor comparing participants randomly assigned to the in-person condition to those assigned to the videoconference condition. Using this design it is possible to test for main effects of each factor and interaction effects. Planned comparisons can be conducted to further test the location of the differences between levels across a factor.

Table 4
Methodological Design of a 2x3 ANOVA

| Condition | Time | | |
|-----------------|------|------|-----------|
| In-person | Pre | Post | Follow-up |
| Videoconference | Pre | Post | Follow-up |

There are several statistical limitations of ANOVA for analysing change. First, one of the assumptions of ANOVA is that there are no cases with missing data. Missing data has to be either estimated so that there is data for all time points, or cases with missing data have to be removed (Tabachnick & Fidell, 2007). Removing cases from the analysis can reduce the power of the analysis therefore it is a less than

ideal solution, particularly in RCTs with small sample sizes (Tabachnick & Fidell, 2007). Although there are a variety of methods for conducting data estimation, there are other statistical methods, such as MLM, that can address the same research question but do not require missing values to be estimated or have cases removed (Holden, Kelley, & Agarwal, 2008). Second, ANOVA uses aggregated mean scores, which can reduce statistical power and/or potentially lead to aggregation bias (Holden et al., 2008). Hence, ANOVA is unable to account for differences across individuals and between individuals over time (Holden et al., 2008; Tabachnick & Fidell, 2007). Third, one of the assumptions of ANOVA is sphericity, which requires that there is equal variance and covariance between the time points measured, which may be difficult to achieve with some measures in real-world clinical samples (Holden et al., 2008).

In summary, a mixed factorial ANOVA with planned comparisons could be used in this research to test if there are significant effects for time and condition. However, given the statistical limitations of ANOVA outlined, other options should to be considered.

3.6.1.2: Multi-level Linear Modelling (MLM)

An alternative to univariate repeated measures ANOVA with planned comparisons is MLM (Bryk & Raudenbush, 1987). If applying MLM for the purposes of this study, time (pre, post and follow-up) is classified as a nominal fixed effect and condition (in-person or videoconference) is classified as an ordinal fixed effects. In the linear model the intercept of the linear line corresponds with the mean for a condition and the slope corresponds to the relationship between the independent variable and the dependent variable. For the purposes of this study it is appropriate to have two levels (see Figure 1) where time (level one) is nested in participant (level two). Using this design, if the full model predicts the variance in participant scores better than an intercept only model then this would suggest that both the intervention and the condition affected participant scores. If only the time factor is a significant predictor then it suggests that both interventions were effective. It is also possible within the one MLM analysis (using SPSS version 19) to conduct planned *t*-test comparisons as follow-up analyses. This enables differences across time between pre and post treatment, post-treatment and follow-up, and between pre-treatment and follow-up to be analysed.

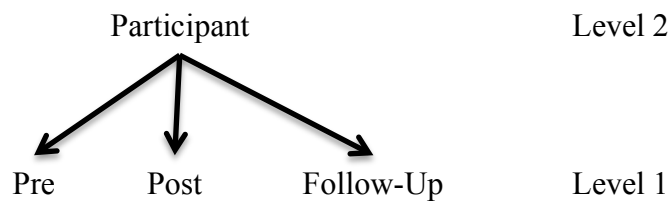


Figure 1. The hierarchical structure of the multilevel linear modelling analysis.

There are several advantages of MLM over ANOVA. MLM does not involve aggregating scores across participants, consequently MLM can account for differences across and between participants over time (Tabachnick & Fidell 2007). Unlike ANOVA the assumption of sphericity does not need to be met in MLM. MLM is also capable of accounting for correlations between data points across time (repeated measures) and is robust to unequal and/or small sample sizes (Diggle & Kenward, 1994; Holden et al., 2008). Furthermore, MLM does not require data at every point in time and between-participant variation can be removed from the comparison between treatment conditions (Goldstein, 1999). It is for these reasons that Holden et al. (2008) argue that MLM should be the preferred method for analysing change in complex real-world participants.

Another benefit of MLM is that there is no need to conduct both an intention-to-treat analysis and a completer analysis. An intention-to-treat analysis includes the data for all participants who began the study even if they did not completed the full course of treatment (Pezuzzi, Henderson, Hartigan, & Lavori, 2002). Whereas a completer analysis restricts the data included to participants who completed the full course of the specified treatment. Lachin (2000) argue that an intention-to-treat analysis is the best method of providing an unbiased approach because it does not involve post-hoc exclusions of the data, which may be inadvertently misleading. Furthermore, not all participants who begin treatment complete the full course of treatment therefore an intention-to-treat analysis has the greatest relevance to real-world practice because it includes those that complete and those that do not complete the full course of treatment (Lachin, 2000). However other researchers (Fisher et al., 1990) argue that intention-to-treat analysis is not a true test of a treatment because the data is not limited to the effect of the intervention. Until recently it has been

recommended that both intention-to-treat analysis and completer analysis analyses be conducted and interpreted (Peduzzi et al., 2002). However, as MLM does not require data for all time points a concurrent intention-to-treat analysis and completer analysis is not necessary. Despite the many advantages of MLM it is not devoid of limitations.

As stated in Section 3.4, the primary research question is concerned with determining if there is a significant difference between in-person and videoconference-based treatment. Most of the prior research has suggested that there are little, if any, differences between in-person and videoconference-based treatment (Gradey et al., 2011; Richardson et al., 2009; Simpson, 2009). Although a hypothesis test can address if a p -value exceeds a critical alpha level, if this value is not reached the researcher cannot conclude that the null hypothesis is true (Cohen, 1990). Cohen (1990) states that when a researcher fails to find a significant effect supporting the alternative hypothesis “all you could conclude is that you *couldn't* conclude that the null was false” (p. 415). With regards to the primary research question at hand, this means that if a significant difference between conditions is not observed then on the basis of a significance test all that could be concluded is that the data was unable to indicate that one of the treatments was significantly better or worse than the other treatment. Consequently, the main research question of this chapter cannot be adequately addressed using only the significance test generated from a MLM or ANOVA analysis.

Despite the lack of suitability of a traditional significance test for the purposes of the main research question, some information can be gained from the analysis that is beyond the initial scope of the hypothesis test. Addressing the effect sizes in a study is a method of quantifying the difference between two means (e.g., ANOVA, t -Tests) or the difference in the strength of two predictors on the outcome variable (e.g., MLM). This is important because if a study is conducted in which there is adequate power to detect an effect, the inability to reject the null-hypothesis can still result in an interpretable finding. For example, if a study is conducted with adequate power yet the alternative hypothesis is not supported then the effect size can be used to determine the size of the difference between treatment means or strength of the MLM model and its corresponding predictors. However, MLM used in isolation may not necessarily be the preferred statistical method for determining if a new form of treatment is as good as an already established treatment.

3.6.1.2: *Noninferiority Trial*

In order to provide a greater exploration of the clinical data and further depth to the clinical conclusions it is possible to combine the results of a MLM analysis with a non-inferiority trial. The purpose of a noninferiority trial/study is to determine if a new treatment is no worse than an already empirically validated treatment (Piaggio, Elbourne, Altman, Pocock, & Evans, 2006). In order to determine if a new treatment is no worse than another treatment a noninferiority margin (Δ) of the validated treatment is developed. This margin is then used to provide a cut-off level. If the mean of the new treatment group is above this specified margin then the data suggests that the new treatment is not inferior to the already established treatment (Piaggio et al., 2006). The primary advantage of a noninferiority trial is that the hypotheses tests are appropriate for investigating non-inferiority and/or equivalence of two treatments (Piaggio et al., 2006).

Traditionally, the null hypothesis in RCT research states that there is no difference between treatments and the alternative hypothesis states that there is a difference between treatments. In a traditional hypothesis test a Type I error refers to the likelihood of falsely rejecting the null hypothesis of no difference and a Type II error refers to the likelihood of falsely accepting the null hypothesis of no difference (Gravetter & Wallnau, 2004). In a noninferiority trial the hypotheses are reversed whereby a Type I error refers to the likelihood of falsely rejecting a null hypothesis that there is a significant difference between treatment outcomes and a Type II error refers to the likelihood of falsely accepting the null hypothesis that there is a significant difference between treatment outcomes (Piaggio et al., 2006). Consequently, the null hypothesis in a noninferiority trial is that the new treatment is inferior and the alternative hypothesis is that the new treatment is not inferior to an already established treatment. Reversing the hypotheses in this fashion allows noninferiority to be formally tested.

Although a noninferiority trial may on the surface appear to be the most appropriate design to be used for determining if treatment via videoconferences is at least as good as in-person, it is not without methodological issues. One of the limitations of noninferiority trial designs is that they lack natural internal validity checks (Jones, Jarvis, Lewis, & Ebbutt, 1996). For example, in the traditional study methodology there is an incentive to minimise sloppiness in design and analysis in

order to maximise the chance of obtaining a significant difference between treatments/conditions. Whereas in a noninferiority trial design that is executed poorly there may not be enough discriminatory power to rule out inferiority. Also, without a waitlist or placebo condition it may be unclear if the participants in both conditions were likely to improve spontaneously without either intervention (Jones et al., 1996). Hence, it is best to have a placebo or waitlist control group to show that both the standard and alternative intervention are both more effective than no treatment. If this is not done then the ‘standard’ intervention should be conducted in the most similar manner possible to previous trials that have already established the standard intervention’s effectiveness. When the intervention is not administered as rigidly as in prior trials, then a non-inferiority/equivalence trial may not be the most appropriate form of analysis to conduct (Greene, Morland, Durkalski, & Frueh, 2008).

Another issue relevant to noninferiority trial designs pertains to the calculation of appropriate confidence intervals of the noninferiority margin. The noninferiority margin chosen should be formed on the basis of prior research and expert consensus and should be the smallest value that would indicate a clinically relevant effect (D’Agostino, Massaro, & Sullivan, 2003; Piaggio et al., 2006). However, there is no gold standard for determining a noninferiority margin (Green, Concato, & Feinstein, 2000). As an alternative to conducting a hypotheses test of non-inferiority it is possible to examine the 95% confidence intervals of the mean change from the pre-treatment to post-treatment and to follow-up (Makuch & Johnson, 1989). If the lower limit of 95% confidence lower limit interval in the alternative treatment is above the lower limit of the reference treatment then it would indicate noninferiority (Makuch & Johnson, 1989). For studies that have small sample sizes that are underpowered non-inferiority and/or equivalence between two treatments can still be explored but will only be capable of providing preliminary evidence. For an example of this in the literature see Frueh, Monnier, Yim et al. (2007).

Although ANOVA, MLM and non-inferiority analyses involves examining and comparing change across time between conditions, none of these analyses are able to determine if the change observed is reliable and/or clinically meaningful. Hence the focus of this chapter will now shift to exploring reliable change and clinically significant change.

3.6.1.3: *Reliable Change And Clinical Significance*

Clinical data can also be analysed for reliable change and clinical significance following the recommendations outlined by Jacobson and Truax (1991). Determining reliable change allows one to ascertain if the change in scores is likely to be due to a 'real' change in symptomology or due to random variation in the measure. Reliable change is determined by calculating a reliable change index. If the reliable change index value obtained is greater than ± 1.96 standard deviations from the mean of the normal distribution then the change observed is unlikely ($p < .05$) to be due to measurement error and thus is deemed reliable (Jacobson & Truax).

A participant is identified as meeting the criteria for clinically significant change if their scores after treatment fall within the 'functional range' of the population. Jacobson and Truax (1991) proposed three cut-off criteria for determining the functional range. Criterion *a*: the participant's post-treatment scores fall outside the disordered population. Criterion *b*: the participant's post-treatment scores fall inside the non-disordered population. Finally, criterion *c*: the participant's post-treatment scores fall closer to the mean of the non-disordered population than the mean of the disordered population. If normative data is available in the prior literature for both the disordered population and the non-disordered population then criterion *c* is the preferred option (Jacobson & Truax, 1991). The decision to use a particular normative sample and not others should be based on a combination of both the sample size and the similarity to the population under study (Jacobson & Truax, 1991).

Once both reliable change and clinical significance is determined the participant's change scores from pre to post treatment or from pre to follow-up can be classified into a category that describes the nature of their change (Jacobson & Truax, 1991). If a participant's change scores meet the criterion for reliable change then they can be classified as *improved*. If the participant's change scores meet the criterion for both reliable change and clinically significant change then they can be classified as *recovered*. If the participant's change scores do not meet the criterion for reliable change then they are classified as *unchanged*. If a participant's symptom scores are identified as meeting the criteria for reliable change and/or clinically significant change but in the opposite direction than intended they are classified as *deteriorated*.

One particular advantage of analysing change scores is that participant outcomes can be compared across participants that were assessed using different outcome measures. For example, provided normative data is available, one participant

could be measured on a scale that assesses symptoms of depression and another participant could be measured on a scale that assesses symptoms of panic, if both participants' change scores are analysed for reliable change and clinical significance both participants can be identified as recovered, improved, unchanged or deteriorated. This method is particularly relevant for study one, given that one of the aims is to investigate clinical outcomes in a diverse clinical population characterised by a mixture of diagnostic profiles. Each clinical condition can be assessed with a questionnaire specifically design to measure that condition and the change scores can be analysed for each participant, thus making it possible to compare participant outcomes on different measures.

In this study reliable change and clinically significant change will be calculated on each of the participant's change scores for each of the primary measures (depression, anxiety, stress and quality of life). However, given that this study aims to evaluate a mixed diagnostic participant group, disorder specific measures relevant to each participant's primary presenting disorder will be administered. Reliable change and clinically significant change will also be analysed on the disorder specific measures to capture any changes in participant symptoms that may not necessarily be captured by the primary measures. Measuring both general and disorder specific levels of illness severity have been recommended in prior a telepsychiatry literature review (Frueh, et al. 2000).

3.6.1.4: Advantages/Disadvantages of a Mixed Client Cohort

The use of a mixed group of participants presenting with a diverse array of clinical presentation raises several issues. If the sample size is sufficient a mixed group of diagnosis allows the result of a study to have a wider range of external validity and relevance to real-world practice, which is also likely to encompass a wide range of conditions. A mixed client group also allows assertions to be made about the general effectiveness of an intervention through a particular media. Together these benefits can enhance the quality of some of the conclusions that can be made from the study. The trade off however is that by including a mixed diagnostic group little can be said regarding the effectiveness of the intervention via the media for specific disorders. Another issue to consider is that the mixed diagnosis may obscure treatment effects. For example, some disorders might be treated more effectively via videoconference and some less effectively, thus the net average result might indicate

that treatment was effective but this is a misguided conclusion. Ideally, the sample size would be sufficient that analyses could be conducted at the general level and at the disorder specific level using both significance testing and change analyses; but to do so would require a substantial amount of resources and funds.

3.6.1.5: Summary

In summary, the statistical methods used to address research question one will be as follows. A MLM analysis for each outcome variable will be used to provide the primary method of comparing treatment outcomes across time obtained in-person to via videoconference. If there is sufficient power a non-inferiority analysis with a formal hypothesis test will be conducted to compare treatment outcomes obtained in-person to via videoconference. If there is insufficient power for a formal hypothesis test of non-inferiority then the analysis of inferiority will be limited to an investigation of the confidence intervals around the mean change scores. In addition to these analyses, reliable change and clinically significant change will also be calculated for each participant.

3.6.2: Rationale For The Statistical Methods Used To Address Research Questions Two-Six

With the exception of research question five, research questions two to six can all be addressed by comparing two independent samples across one time point. An independent *t*-test is generally considered to be the most appropriate statistical method provided that the necessary assumptions are met for the analysis (Gravetter & Wallnau, 2004). It is important to note that prior reviews (Grady et al., 2011; Richardson et al., 2009; Simpson, 2009) suggest that it is unlikely a significant difference will emerge between in-person and videoconference-based outcomes therefore the focus of the analyses will be the effect sizes obtained. The purpose of research question five is to provide greater descriptive detail regarding participant satisfaction with the videoconferencing technology used in study one. Therefore, descriptive statistics are the most appropriate form of statistical analysis.

3.7: Chapter Summary

This chapter has provided the theoretical, methodological and statistical rationale for study one. Videoconferencing may provide an avenue for increasing

mental health services to remote populations, but research is required to determine if this technology can be used to provide CBT as successfully as when provided in-person. The primary research question posited is does CBT administered via videoconference result in different clinical outcomes than when administered in-person?

A RCT with an active treatment control condition will be used in order to address the impact of both time and condition on clinical outcomes. The most appropriate statistical approach to use is MLM with planned comparisons *t*-tests. In order to further explore the potential differences between conditions a preliminary non-inferiority analysis will be conducted and an analysis of reliable change and clinical significance. Independent samples *t*-tests will be used to investigate differences in the therapeutic alliance, satisfaction and treatment credibility. A diverse clinical population will be used characterised by a mixture of diagnoses and comorbid condition. The intervention will comprise of a 12-week empirically supported CBT intervention specific to the participant's primary presenting disorder. Symptoms of depression, anxiety and stress, and quality of life will be measured at pre-treatment, post-treatment, and six weeks following treatment. Disorder specific measures will also be used to identify any changes as a result of treatment that may not necessarily be captured by the global outcome measures. At post treatment participant satisfaction, participant perceptions of the working alliance and therapist perceptions of the working alliance will also be measured.

Chapter 4: Study One: Randomised Controlled Trial of Cognitive-Behaviour Therapy Via Videoconference

This chapter provides the details of study one, which was undertaken to investigate if CBT administered via videoconference is as effective as treatment provide in-person. The design proposed and discussed in chapter three is a RCT involving a diverse clinical population. This chapter begins by describing the methods used to conduct the study. Participant symptoms were measured at pre-treatment, post-treatment and 6-weeks following treatment, and ratings of the therapeutic alliance, satisfaction and treatment credibility were measured at post-treatment. After the Methods section the results of study one are provided. Data was analysed using MLM combined with subsidiary analyses investigating non-inferiority, reliable change and clinically significant change. The chapter concludes with a discussion of the findings.

4.1 Method

4.1.1 Research Design

This study used a randomised, active control design, with measures administered at pre-treatment, post-treatment, and at six-weeks follow-up. An active control group was used because the general consensus in the literature regarding treatment via videoconference is that it is better than no intervention (Richardson et al., 2009). Furthermore, in-person CBT has been shown to be more effective than both a placebo and supportive counselling (Barlow, 2008). Thus, in-person treatment provides a high standard against which videoconference-based psychotherapy can be judged. The same therapist (author) conducted all of the in-person and videoconference-based sessions.

4.1.2 Inclusion/Exclusion Criteria

The inclusion criteria for participation in study one consisted of a primary diagnosis of an *DSM-IV-TR* (2000) Axis-I disorder, to be aged between 18-65years old, to live within the metropolitan region of Perth Western Australia, to be able to attend the clinic in person and to be available for one hour per week over a 12-week period plus one follow-up session six weeks after treatment had ended. Furthermore,

participants who reported taking medication for psychological issues needed to remain on their current dosage until the end of their involvement in the study and those not on medication were asked to refrain from beginning any medications for psychological conditions. The exclusion criteria included a *DSM-IV-TR* (2000) diagnosis of anorexia, psychosis (past or present) or a personality disorder as the primary diagnosis, as well as any current self-harm or suicidal behaviours, receiving concurrent psychotherapy and/or involvement in legal proceedings.

4.1.3 Recruitment

Participant recruitment began in January 2010 and ended in April 2011. Participants were recruited via the Curtin University Psychology Clinic and were either self-referred or referred from community health agencies via telephone, letter, fax or e-mail. Information about the study was sent by email or post to the following organisations; all four Western Australian University counselling centres and six major metropolitan governmental psychological services including the Avro Mental Health Clinic, Centre for Clinical Interventions, Fremantle Adult Mental Health Services, Mills Street Centre and Osborne Clinic. Members of the Australian Association for Cognitive Behavioural Therapy were also contacted via e-mail. Information was sent via post to 180 private psychiatrists and 270 clinical psychologists working in Western Australia. Furthermore, news articles pertaining to the study were published in the Canning Times newspaper and the West Australian newspaper. However, despite the array of sources that were contacted, the Curtin University Adult Psychology Clinic only received 10 referrals specifically related to this research. The remainder of participants included in this study were also recruited through the clinic but they were referred to the clinic unaware of this study. In total 33 participants were referred either directly for involvement in the study or indirectly through the clinic, however, four of those were assessed as not suitable at the referral stage. Two of the referrals were rejected because the participants were not able to attend the sessions at the clinic, one of the referrals was unable to be contacted, and one of the referrals was inappropriate because the participant had both legal issues and psychotic features.

4.1.4 Participants

Twenty-nine participants attended the initial assessment session, however three participants were excluded from the study; one because their primary diagnosis was Obsessive-Compulsive Personality Disorder, one because they had had previous episodes of psychosis and one was receiving concurrent psychotherapy services. Hence, the final sample included 26 participants, the ages ranged from 18-59 years ($M = 30$ years, $SD = 11$ years). The videoconferencing condition included six males and eight females, whereas the in-person condition included five males and seven females. This sample size provided sufficient power to detect a large effect (see Section 4.1.8.1 for a further discussion of power)

The average number of presenting disorders in both conditions was three, and there were only two participants that presented with only one diagnosis. The number of participants in each condition who met the criteria for a primary diagnosis of an Axis-I disorder is displayed in Table 5.

Table 5

The Number of Participants that Presented with a Primary Diagnosis of An Axis-I Disorder By Treatment Condition

| Axis-I | Condition | |
|-----------------------------------|-----------|-----------------|
| | In-Person | Videoconference |
| Major Depressive Disorder/MDD-NOS | 5 | 1 |
| Dysthymic Disorder | | 1 |
| Panic With Agoraphobia | | 1 |
| Panic Without Agoraphobia | 1 | |
| Social Phobia | | 1 |
| Obsessive-Compulsive Disorder | 4 | 8 |
| Generalised Anxiety | 2 | |
| Hypochondriasis | | 1 |
| Adjustment Disorder | | 1 |

The number of participants in each condition who met the criteria for a secondary diagnosis of an Axis-I disorder is displayed in Table 6. The number of

participants in each condition who presented with a secondary diagnosis of an Axis-II disorder is displayed in Table 7. More participants in the in-person condition presented with a primary diagnosis of depression than in the videoconferencing condition, with more participants in the videoconferencing condition presenting with a primary diagnosis of OCD than in the in-person condition. Diagnosis was conducted in-person therefore these differences are not a reflection of the differences between in-person and videoconference-based diagnosis. Overall, Tables 5-7 indicate that the participant group was composed of a varied mix of primary and comorbid secondary *DSM-IV-TR* diagnoses.

Table 6

The Number of Participants that Presented with a Comorbid Secondary Diagnosis of an Axis-I Disorder By Treatment Condition

| Axis-I | Condition | |
|---|-----------|-----------------|
| | In-Person | Videoconference |
| Major Depressive Disorder/MDD- NOS | 3 | 4 |
| Dysthymic Disorder | 3 | 3 |
| Cyclothymic Disorder | | 1 |
| Panic Without Agoraphobia | 2 | |
| Social Phobia | 1 | |
| Obsessive-Compulsive | 1 | 1 |
| Post-Traumatic Stress | 2 | |
| Generalised Anxiety | 3 | 2 |
| Hypochondriasis | 1 | 1 |
| Eating Disorder NOS (Binge Eating) | 2 | |
| Alcohol Dependence | | 1 |
| Cannabis Dependence | | 1 |
| Dyspareunia | 1 | |
| Impulse Control Disorder (NOS) (Shopping Addict) | | 1 |
| Attention-Deficit Hyperactivity | 2 | |
| Amphetamine-Induced Psychotic Disorder | | 1 |
| Substance-Induced Mood Disorder with Manic Features | | 1 |

Table 7

The Number of Participants that Presented with a Comorbid Secondary Diagnosis of an Axis-II Disorder By Treatment Condition

| Axis II Diagnosis | Condition | |
|----------------------|-----------|-----------------|
| | In-Person | Videoconference |
| Schizotypal | | 1 |
| Borderline | 1 | |
| Narcissistic | 1 | 1 |
| Avoidant | 6 | 4 |
| Obsessive-Compulsive | 5 | 9 |

4.1.5 Treatment Protocols/Manuals

For every participant an individualised cognitive-behavioural formulation was devised. Manualised CBT interventions were used as a guide to planning and implementing treatment. The manualised interventions used and their sources are listed in Table 8. For conditions not included in Table 8 standard CBT techniques were employed, which included psychoeducation, symptom monitoring, cognitive restructuring and exposure exercises relevant to their presenting symptoms.

Although the content of the manuals did not need to be altered, the process of how that content was implemented was, on occasion, modified. This was something that was expected before beginning data collection. For example, addressing cognitions by typing them into a word document on the clients' computer was used to simulate the in-person procedure of writing cognitions down on a whiteboard or sheet of paper. In session behavioural experiments via videoconference had to be limited to what could be achieved within the consulting room whereas in-person sessions were able to move outside the consulting room if needed (which they weren't during the course of this study). Client thought and homework diaries via videoconference had to be shared orally, which some clients reported that they would have preferred if they could have handed it to the clinician to read for themselves.

Two years prior to beginning data collection the treating therapist (author) was trained to administer the manualised treatment as part of his post-graduate training. Further clinical experience with the manualised treatments was gained through a post-

graduate practicum that occurred one year prior to beginning data collection. Consequently, the treating therapist was experienced in providing the manualised treatments before beginning the data collection.

4.1.6 Measures

A range of diagnostic, general clinical and disorder specific measures were used throughout the study. Diagnostic measures are presented in Section 4.1.5.1. Section 4.1.5.2 presents the details of the measures used to assess the primary clinical outcomes and Section 4.1.5.3 provides the details of the disorder specific measures.

Table 8

Primary Diagnosis and Corresponding Treatment Manuals/Guidelines Used

| Primary Diagnosis | Guideline | Source |
|-------------------------------|---|------------------------------------|
| Panic/Agoraphobia | Mastery of Panic | Barlow and Craske (2000) |
| Depression/Dysthymia | Cognitive Therapy For Depression | Beck et al. (1979) |
| Health Anxiety | Treating Health Anxiety | Taylor and Asmundson (2004) |
| Generalised Anxiety Disorder | Mastery of Anxiety and Worry | Craske, Barlow, and O’Leary (1992) |
| Obsessive-Compulsive Disorder | Obsessive-Compulsive Disorder: A Practical Guide to Treatment | Rees (2009) |

4.1.6.1 Diagnostic Measures

4.1.6.1.1 Structured Clinical Interview for the DSM-IV (SCID-I) and the Structured Clinical Interview for the DSM-IV Personality Disorders (SCID-II).

The SCID-I (First, Spitzer, Gibbon, & Williams, 1996) and the SCID-II (First, Gibbon, Spitzer, Williams, Benjamin, 1997) were used to screen the participants and determine the diagnosis. The SCID-I and SCID-II are both semi-structured interviews designed to aid DSM-IV diagnosis, Axis-I and Axis-II respectively, and are frequently used in both routine clinical practice and clinical research (Zanarini & Frankenburg, 2001). The SCID typically takes between one and two hours to administer and is considered to be the ‘gold standard’ for diagnosing Axis-I and Axis-II disorders (Zanarini & Frankenburg, 2001). The inter-rater reliability of the SCID-I for diagnosing various Axis-I disorders has been reported as ranging from .7 to 1 and

the test-retest reliability (7-10 days after the first administration) ranging from .53 to 1 (Zanarini & Frankenburg, 2001). The inter-rater reliability of the SCID-II has been reported to range from .48 to .98 and the intra-class correlation coefficient ranging .9 to .98 (Maffei et al., 1997). Fennig, Craig, Lavelle, Kovasznay, and Bromet (1994) used longitudinal methods to compare the SCID-I to standard clinical interviewing for diagnostic purposes and reported that the SCID has superior validity.

4.1.6.1.2 Interference of Severity Scale (ISS)

Co-morbidity was common amongst the participants, therefore the Interference of Severity Scale (ISS), adapted from the Anxiety Disorders Interview Schedule (Brown, DiNardo, & Barlow, 1994) was used to supplement the SCID administration. If a participant's assessment on the SCID indicated that they met the criteria for a particular disorder then the ISS was administered. The ISS ranges from 0-8, higher scores indicate that the disorder has a greater perceived degree of interference in their lives. This additional scale allowed the researcher to determine which presenting disorder was causing the most amount of interference in the participant's life, which would in turn determine which disorder out of a co-morbid array of disorders should be addressed in treatment. This measure was only used to determine the primary diagnosis.

4.1.6.2 Primary Clinical Outcome Measures

The primary clinical outcome measures were administered to all of the participants who received treatment during the course of study one.

4.1.6.2.1 Depression Anxiety and Stress Scale (DASS-21)

The DASS (Lovibond & Lovibond, 1995) is comprised of a set of three self-report scales, which have been designed to measure and differentiate between the negative emotional states of depression, anxiety and stress. Each DASS scale contains seven items, each rated on a four point scale; 0 = did not apply to me at all, 1 = applied to me to some degree, or some of the time, 2 = applied to me to a considerable degree, or a good part of time and 3 = applied to me very much, or most of the time (Lovibond & Lovibond, 1995). Example items include; 'I felt I had nothing to look forward to' on the depression subscale 'I was aware of dryness of my mouth' on the anxiety subscale, and 'I tended to over-react to situations' on the stress subscale. The

scores on each scale range from 0 - 42, high scores indicate a greater severity of symptoms. This measure was selected because it is applicable to all of the disorders that could be relevant given the inclusion criteria. Crawford and Henry (2003) examined the latent structure of the DASS using confirmatory factor analysis and reported that the best fitting model involved three correlated factors; corresponding to anxiety, depression and stress. Crawford and Henry used Cronbach's alpha to estimate the reliability of DASS and reported that for the depression scale it was .94, for the anxiety scale it was .89, for the stress scale it was .93, and for the total score it was .96. Crawford and Henry also investigated the convergent and discriminate validity of the DASS by calculating the Pearson product-moment correlations between the DASS, the Personal Disturbance Scale (Bedford & Foulds, 1978), the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983), and the Positive and Negative Affect Schedule (Watson et al., 1988). The DASS depression subscale correlated highly (.78) with the PDS depression subscale, the HADS depression subscale (.66), the PANAS negative affect subscale (.60) and negatively correlated (.48) with the PANAS positive affect subscale. The DASS anxiety subscale correlated highly (.72) with the PDS anxiety subscale, HADS anxiety subscale (.6) and negatively (-.29) with the PANAS positive affect subscale. The DASS stress subscale correlated significantly (.67) with the PANAS negative affect subscale and negatively (.31) with the PANAS positive affect subscale.

4.1.6.2.2 Quality of Life Enjoyment and Satisfaction Scale (QLES-Q).

Ritsner, Kurs, Gibel, Ratner, and Endicott (2005) developed an abbreviated version of the QLES-Q (Endicott, Nee, Harrison, & Blumenthal, 1993) that consists of 18 items that aim to measure a participant's quality of life, enjoyment and satisfaction and takes 10-15 minutes to complete. Each item is scored on a five point scale, ranging from 1 = 'never', 2= 'rarely', 3= 'neutral', 4= 'somewhat' to 5= 'frequently', regarding how much time during the past week he particular item applied. Example items include 'felt in at least very good physical health', 'felt happy or cheerful' and 'felt able to communicate with others'. Averaged total scores range from 1 - 5. Higher scores indicate better enjoyment and satisfaction with specific life domains, including physical health, subjective feelings, leisure time activities and social relationships. Although emotional functioning and quality of life may change simultaneously, it is possible for a participant's emotional functioning to improve but

not their quality of life or for their quality of life to improve but not their emotional functioning. It is for this reason that the QLES-Q has been included in this study in addition to the DASS.

Initial validation studies on the QLES-Q indicated that the measure has good internal reliability and discriminative validity. Ritsner et al. (2005) administered the shortened QLES-Q to 339 inpatients, 133 outpatients and 175 'healthy participants', and examined the internal consistency of the short form, which ranged from .74 to .97 indicating moderate to high internal consistency. In order to examine construct validity Ritsner et al. (2005) compared the results obtained for the 'unhealthy sample' to the 'healthy sample' and found that the questionnaire was able to distinguish the groups. Furthermore, a significant correlation (.97) was obtained between the score on the full QLES-Q and the shortened version. Ritsner et al. (2005) also examined the test-retest reliability over a two-week time period of the shortened QLES-Q and reported that the interclass correlation was .9. Item 18 on the QLES-Q pertains to medication: participants on medication complete that item and those that are not on medication do not complete that item. Given that the total QLES-Q score is an average of either 17 or 18 scores depending on the participant, the decision was made to remove item 18 from this study so that all QLES-Q questionnaires were identical for each participant. This decision is congruent with the findings of Ritsner et al. (2005) who found that the item did not load on any of the four factors that comprise the QLES-Q.

4.1.6.2.3 Working Alliance Inventory, Short Form (WAI -S)

The WAI-S (Tracy & Kokotovic, 1989) is based on the measure developed by Horvath and Greenberg (1989). It is comprised of two questionnaires, one for the therapist and one for the participant, and yields a total alliance score as well as three sub-scores, which assess agreement on in-session tasks, agreement on treatment goals, and the development of a mutual bond. The measure consists of 12 items rated on a seven point scale ranging from 1 = 'never', 2 = 'rarely', 3 = 'occasionally', 4 = 'sometimes', 5 = 'often', 6 = 'very often', and 7 = 'always'. Some items are positively worded, for example "My client and I both feel confident about the usefulness of our current activity in counselling" and others are negatively worded, such as "I have doubts about what we are trying to accomplish in counselling". After recoding negative items averaged scores range from 1 - 7, with higher scores indicating a

greater quality of working alliance. Busseri and Tyler (2003) reported that both the participant and therapist versions of the WAI-S have a high level of internal consistency (.91) with no significant differences observed between the scores obtained on the full WAI and the WAI-S.

4.1.6.2.4 Client Satisfaction Questionnaire (CSQ)

The original CSQ (Larsen, Attkisson, Hargreaves, & Nguyen, 1979) was comprised of 18 items measuring client satisfaction that are each rated on a four point scale. Attkisson and Zwick (1982) developed a shortened version of the CSQ involving only eight items and found that the CSQ-8 performed as well as the CSQ-18 in all aspects of both reliability and validity and thus because of its brevity it should be used in preference of the CSQ-18, hence the CSQ-8 was used in this study. The worded response that corresponds to each point on the scale is different for each item on the measure. For example the responses to item one (“how would you rate the quality of service you received”) ranged from 4 = ‘excellent’, 3 = ‘good’, 2 = ‘fair’ to 1 = ‘poor’, whereas for item five (“how satisfied are you with the amount of help you have received”) the responses ranged from 4 = ‘quite dissatisfied’, 3 = indifferent/mildly dissatisfied, 2 = ‘mostly satisfied’ to 1 = ‘very satisfied’. Total scores range from 8 - 32 with higher scores indicating a higher degree of participant satisfaction. Attkisson and Zwick (1982) compared the ratings participants made on the CSQ to their level of service utilization and psychotherapy outcome. The results indicated that the CSQ had a high degree of internal consistency (.91), was significantly correlated with service utilization (.61) and had noticeable correlation (.35) with the degree of participant-reported change.

4.1.6.2.5 Telehealth Satisfaction Questionnaire (TSQ)

The TSQ (Yip, Chang, Chan, & Mackenzie, 2002) is a questionnaire that has been developed to provide an evaluation of client satisfaction with the use of telemedicine services. The measure involves 14 items each rated on a five point scale ranging from 1= ‘strongly disagree’, 1 = ‘disagree’, 3 = ‘neutral’, 4 = ‘agree’ to 5 = ‘strongly agree’. Example items include “I can easily talk to my health-care provider” and “I find telemedicine an acceptable way to receive health-care services”. Scores range from 14 - 70 with higher scores indicating a greater degree of satisfaction with telemedicine services. Preliminary research (Yip et al., 2002) indicated that the

measure has a high degree of internal consistency (.93) and predictive validity, which was investigated by measuring treatment adherence to a self-management intervention program administered via videoconference. The results indicated a significant positive correlation between participant scores on the TSQ and treatment adherence ($r = .40$). A principal-components factor analysis indicated that the TSQ can be separated into three constructs; quality of care provided, similarity to in-person the encounter and perception of the interaction (Yip et al., 2002). However, given that the reliability of the TSQ was assessed using the total score, the total TSQ score was used in this study instead of the component subscale scores.

4.1.6.2.6 Credibility of Therapy Questionnaire (CTQ)

The CTQ developed by Borkvec and Nau (1972) is a measure that has been designed to assess the degree to which participants perceive the treatment they are receiving to be credible. The original CTQ consisted of five items and are displayed in Table 9. Borkvec and Nau (1972) administered the questionnaire to 50 college students who read accounts of different forms of treatment for social phobia. Two of the accounts were therapy rationales, three were placebo and one was a component-control procedure. The data obtained indicated that the therapy conditions were perceived as most credible. Subsequent research has been conducted on the CTQ using variations of the original scale modified to suit the needs of the specific study (Devilley & Borkovec, 2000). In the version of the questionnaire used by Devilly and Borkovec (2000) the Cronbach's alpha indicated a high degree of internal consistency (0.85) and the test-retest reliability was also high ($r = .67$). Devilly and Borkovec (2000) also reported that the CTQ significantly was correlated ($r = -.7$) with outcome scores on the Symptom Checklist-90-R (Derogatis, 1992). In order to make the items applicable for the current study several of the original questions were modified, see Table 9. The CTQ used in this study involved four questions each rated on a ten point scale. The first item ranged from 1 = "not logical" to 10 = "logical", the second and third items range from 1 = "not confident" to 10 = "confident", and the final item ranged 1 = "not successful" to 10 = "successful". Thus the total scores range from 0 - 40. Higher scores indicate a greater degree of perceived treatment credibility.

Table 9

A Comparison Of The Original Questions In The CTQ And Those Used In This Study

| Item | | |
|--------|--|--|
| Number | Original Items | Used Items |
| 1 | How logical does this type of treatment seem to you? | No change |
| 2 | How confident would you be that this treatment would be successful in eliminating fear of speaking before a group? | How confident are you that this treatment can/could be successful in eliminating your presenting concerns? |
| 3 | How confident would you be in recommending this treatment to a friend who was extremely anxious about making speeches? | How confident would you be in recommending this treatment to a friend who had similar concerns? |
| 4 | If you were extremely anxious in speech situations, would you be willing to undergo such treatment? | Removed |
| 5 | How successful do you feel this treatment would be in decreasing a different fear; for example, strong anxiety about taking tests? | How successful do you feel this treatment will/could be in decreasing a different mental health problem? |

4.1.6.3 Additional Disorder-Specific Measures

Unlike the primary clinical outcome measures that were administered to all participants, the additional disorder-specific measures were only administered to participants with matching presentations.

4.1.6.3.1 Anxiety Sensitivity Index-Revised (ASI-R)

The ASI-R is a frequently used measure of symptom change for clients with panic disorder (Taylor & Cox, 1998). The measure aims to assess anxiety symptoms relating to cardiovascular, respiratory, gastrointestinal, publicly observable, dissociative, and cognitive control. The current version of the measure has been

psychometrically improved from past versions of the questionnaire (Peterson & Reiss, 1992). The ASI-R includes 36 items all rated on a five point scale (ranging from 0 = 'very little' to 4 = 'very much'). Example items include "It scares me when I feel faint" and "I believe it would be awful to vomit in public". Total scores range from 0 - 144 with greater scores indicating a higher severity of symptoms. Deacon, Abramowitz, Woods, and Tolin (2003) examined the reliability and validity of the measure and reported that the internal consistency was .96.

4.1.6.3.2 Beck Depression Inventory-II (BDI)

The BDI is a 21-item multiple-choice self-report inventory and it is one of the most widely used instruments for measuring the severity of depression and clinical improvements (Beck et al., 1996). Each item pertains to a different area of emotional functioning, such as sadness, pessimism and guilty feelings. For each item there is four potential response options and the responses are different for each item. For example, the responses for item one pertaining to sadness range from 0 = 'I do not feel sad', 1 = 'I feel sad much of the time', 2 = 'I am sad all the time', to 3 = 'I am so sad or unhappy that I can't stand it', whereas for item three pertaining to past failures the responses range from 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', to 3 = 'I feel I am a total failure as a person'. For all of the items high scores indicate a high degree of symptoms. Total scores range from 0 - 63. Buckley, Parker and Heggie (2001) assessed the psychometric properties of the BDI-II in a clinically depressed participant group and reported that the coefficient alpha was .91.

4.1.6.3.2 Brief Fear of Negative Evaluation (BFNE)

The BFNE scale is comprised of 12 items relating to fearful or worrying cognitions regarding interpersonal evaluation (Learly, 1983). Participants are asked to rate items according to how much the statement applies to them and are rated on a five-point scale (ranging from 1 = 'not at all', 2 = 'slightly', 3 = 'moderately', 4 = 'very' to 5 = 'extremely'). Example items include "I am frequently afraid of other people noticing my shortcomings" and "I'm afraid that others will not approve of me". Total scores range from 12 - 60 with higher scores indicating a greater degree of social related anxiety. The brief version of the scale has the advantage of being less than half the length of the original measure by Watson and Friend (1969) and yields a

correlation with the full measure of .96 (Learly, 1983). Duke, Krishnan, and Faith (2006) examined the psychometric properties of the BFNE and reported that the internal consistency was .8 and the scores obtained were significantly correlated ($r = .32$) in the expected directions with the BDI and the Fear Questionnaire- Social Phobia subscale (Marks & Matthews, 1979). Collins, Westra, Dozois, and Stewart (2005) also investigated the BFNE and found that it is sensitive to pre-post treatment change in clinical populations.

4.1.6.3.3 Health Anxiety Questionnaire (HAQ)

The HAQ was developed by Lucock and Morley (1996) and is intended to be used to identify individuals with high levels of concern about their health. The measure involves 21-items each rated on a four-point scale ranging from 0 = 'not at all or rarely', 1 = 'sometimes', 2 = 'often' to 3 = 'most of the time'. Example items include "do you ever worry about your health" and "do you ever examine your body to find whether there is something wrong". Total scores range from 0 - 84 with higher scores indicated a higher degree of health anxiety. In a study involving both psychiatric and medical samples (Lucock & Morley, 1996) the HAQ was found to have high internal consistency (.92) and temporal stability as measured by the test-retest reliability over a six-week period ($r = .94$).

4.1.6.3.4 Impact of Events Scale Revised (IES-R)

The IES-R (Weiss & Marmar, 1996) measures trauma symptom severity and includes 22-items. Example items include "pictures about [the traumatic event] popped into my mind" and "I was jumpy and easily startled". Each item is rated on a five point scale, ranging from 0 = 'not at all', 1 = 'a little bit', 2 = 'moderately', 3 = 'quite a bit' to 4 = 'extremely'. Total scores range from 0 - 88 and greater scores suggest a greater degree of post-traumatic stress. Creamer, Bell, and Failla (2003) examined the psychometric properties IES-R in a sample of Vietnam veterans and compared them to a relative community sample. They reported that the internal consistency of the scale was .96 and the correlation between the IES-R and the PTSD Checklist (Weather, Litz, Herman, Huska, & Keane, 1993) was .84.

4.1.6.3.5 Leeds Dependency Questionnaire (LDQ)

The LDQ (Raistrick et al., 1994) is a measure used to provide an indication of the severity of drug dependence and includes 10-items. Each item is rated on a five point scale, ranging from 1 = 'never', 2 = 'sometimes', 3 = 'often', 4 = 'nearly' to 5 = 'always'. Example items include "is drinking or taking drugs more important than anything else you might do during the day?", and "do you feel you have to carry on drinking or taking drugs once you have started?". Total scores range from 5 – 50, with higher scores indicating a greater degree of drug dependency. According to Raistrick et al. (1994), the questionnaire is sensitive to drug addicts that are experiencing a range of psychological symptoms of dependence, such as cravings, compulsions to use and narrowing of behavioural activities. A principal components analysis was conducted on the LDQ and the results indicated that 64% of the variance could be attributed to a single factor, which is assumed to be the amount of drug dependence (Raistrick et al., 1994). Test-retest reliability from 2 - 5 days was .95 and the LDQ significantly correlated with two similar measures.

4.1.6.3.6 Obsessive Compulsive Inventory-Revised (OCI-R) (Foa et al., 2002)

The OCI-R (Foa et al., 2002) is an improved version of the psychometrically sound obsessive-compulsive inventory (Foa, Kozak, Salkovskis, Coles, & Amir, 1998). The revised version contains 18 items, each on a five point scale, ranging from 0 = 'not at all', 1 = 'a little', 2 = 'moderately', 3 = 'a lot' to 4 = 'extremely'. Example items include "I got upset if objects are not arranged properly" and "I felt I had to repeat certain numbers". Total scores range from 0 - 90, with higher scores indicating a greater degree of obsessive-compulsive symptomology. Foa et al. (2002) investigated the psychometric properties of the OCI-R and found that the internal consistency was .7, the test-retest reliability over a two week period ranged from .74 to .91 and the correlation with the Maudsley Obsessive-Compulsive Inventory (Hodgson & Rachman, 1977) was .85. Furthermore, the correlation between the OCI-R and the original inventory was .98.

4.1.6.3.7 Penn State Worry Questionnaire (PSWQ)

The PSWQ (Meyer, Miller, Metzger, & Borkovec, 1990) is widely used to measure the severity of worry in clients with generalised anxiety disorder (Stoeber, 1998; Fresco, Mennin, Heimberg, & Turk, 2003). The measure includes 15 items,

each rated on a seven point scale ranging from 0 = 'never', 1 = 'very rarely', 2 = 'rarely', 3 = 'sometimes', 4 = 'often', 5 = 'very often' to 6 = 'almost always'. Example items include "Many situations made me worry" and "I noticed that I had been worrying about things". Total scores range from 0 - 19, with higher scores indicating a higher degree of symptom severity. Stoeber and Bittencourt (1998) adapted the wording of the PSWQ so that it was suitable for weekly measurement and then assessed its ability to monitor treatment-related changes in worry before, during and after treatment. The results of their study indicated a reliability of .91 and a correlation of .63 with a similar weekly measure.

4.1.7 Apparatus

Over the course of the study three Apple Mac computers were used and a variety of accompanying software. One computer was an iMac 3.06GHz Intel Core 2 Duo with 4GB 1067MHz RAM using Mac OS X 10.6.2 and had a 21.5inch widescreen LED-backlit display. All participants used this computer. The second computer was an iMac 2.66GHz Intel Core 2 Duo with 2GB 800MHz DDR2 SDRAM using Mac OS X 10.5.8 and had a 20inch widescreen display. The third computer was a MacBook Pro 2.66GHz Intel Core i7 with 4GB 1067MHz DDR3 RAM using Mac OS X 10.6.5 and had a 15.4inch widescreen LED-backlit display. The clinician's choice to use either the second iMac or the MacBook Pro was determined by the availability of the rooms in which they resided. All computers were connected via Ethernet within the same building and thus the Bonjour local network feature was used. The primary program used to conduct the videoconferencing was iChat, versions ranging from 4.0.9 to 5.0.3. The iChat program allows the user to record the chat, change the size of the chat window, start an additional simultaneous text chat if desired, adjust the picture-in-picture (view of oneself within the chat window) and share documents with the users, such as pictures, video or Microsoft Office documents.

In order to achieve maximum simplicity in the use of the technology, an Apple Script was written in AppleScript Editor 2.3 to automate several of the iChat functions. An Apple Script involves creating several lines of code relevant to a particular program that when activated triggers the program to make several adjustments automatically. Consequently, the Apple Scripts allowed the clinician in this study to press one button to start the chat and one button to end the chat. For the

purposes of this study the clinician's computer was set up to automatically record, adjust the videoconferencing window to the largest size in relation to the relevant screen, and close the main window when the chat ends. The participant computer was set up to automatically accept incoming connections from the two clinician-computers, resize to full screen, remove the picture-in-picture, and automatically close the chat window when ending the chat. The decision to remove the picture-in-picture on the participants' screen was made on the basis of previous research (Mitchell et al., 2003; Simpson et al., 2005) in which some participants reported feeling self-conscious when the picture-in-picture function was activated because they could see themselves on screen.

Congruent with the recommendations by Grady et al. (2011) further clinician control was obtained through the use of the Screen Sharing program in Mac OS X, which ranged from version 1.0.3 to 1.1.1. This program allowed the clinician to control the participants' computer, thus eliminating the need to go into the room or talk to the participant via telephone or videoconference to help them control the computer. This program was extremely useful for accepting 'permission to record the chat' on the participants' computer, adjusting windows where necessary (such as for any additional text chat), and opening-closing programs. Furthermore, the Screen Sharing program made it possible for both the participant and the therapist to type into the same Microsoft Word document (versions ranged from 12.1.7 to 12.2.8), which was being displayed on the participant's computer. Thus, an open Microsoft Word document could be used as a digital whiteboard for conducting cognitive restructuring. Additional devices used included both a hand held whiteboard and a larger one mounted on the wall, which were used in some in-person cognitive restructuring activities.

4.1.8 Procedure

Approval to conduct study on was granted by the Curtin University Human Research Ethics Committee (see Appendix A). Once referred to the clinic, participants were contacted via telephone to discuss their problems in more detail and to briefly assess if they were appropriate for the clinic and the study. If appropriate on initial screening an assessment appointment was arranged. Materials relevant to the clinic and the study, such as information and consent forms (see Appendix B-D) were sent to participants in the post so they had ample time to read them before coming in

for the initial assessment. The therapist (author) who conducted the initial screening, diagnosis and treatment was a provisionally registered (trainee) clinical psychologist doctoral student.

Once the participant arrived at the clinic they were asked to enter a nearby room to conduct the assessment session. The initial session began by reviewing the information sheet to determine comprehension, followed by an outline of clinical practice regarding confidentiality and the structure of the session. In order to have a general understanding of the problem before conducting a thorough assessment, the participant was asked to provide a brief 5-10 minute description of their primary presenting problem. After this the SCID was administered, followed by a genogram depicting their relationships to family members. The last part of the session involved asking any further questions that seemed of relevance in light of the SCID and genogram. Participants were also asked not to begin any medication for their mental health issues if they were not already on medication. Those who were already on medication were asked not to change their dose until after the follow-up session. Diagnosis was conducted in-person for both conditions as this study was primarily concerned with examining the differences in treatment effects via the two modalities rather than diagnosis. Furthermore, the general consensus in the literature (Richardson et al., 2009) is that diagnosis via videoconference is as valid and reliable as diagnosis conducted in-person. However, it is important to note the clinician who conducted the diagnostic assessment session was also the therapist who administered the subsequent treatment. The issues associated with this are discussed below in Section 4.3.6. On completion of the assessment session participants were asked to fill out any remaining questionnaires (Table 10 displays the additional measures used for different participant groups) that had not yet been completed and were informed about which condition they had been randomised into.

Simple random allocation was used to determine assignment to condition. This was achieved by generating a randomised list of binary numbers via the website <http://graphpad.com/quickcalcs/randomize1.cfm>. The generated list was calculated on the basis of 200 potential participants, two groups and one repeat of randomisation. Once the assessment session had been completed and all consent forms had been signed, the participant's name was entered into the next available position on the randomised binary list, which indicated whether they would be treated in-person or via videoconference. Participants were told which condition they were in after they

had signed the consent forms. This prevented participants agreeing to be in the study only because they knew that they were going to receive in-person or videoconference-based treatment. Due to the use of a randomised list, clients in both conditions were evenly distributed across the course of the study. Therefore there was not a disproportionate amount of clients in one condition at the start or end of the project, and thus therapist experience was equally distributed across conditions.

Table 10

Relationship Between Primary Diagnosis and the Disorder Specific Measure Used

| Primary Diagnosis | Measure | | | | | | | |
|--------------------------------|---------|--------|------|-----|-------|-----|-----|------|
| | ASI | BDI-II | BFNE | HAQ | IES-R | LDQ | OCI | PSWQ |
| Panic/Agoraphobia | X | | | | | | | |
| Depression/Dysthymia | | X | | | | | | |
| Social Phobia | | | X | | | | | |
| Health Anxiety | | | | X | | | | |
| Post-Traumatic Stress Disorder | | | | | X | | | |
| Substance Dependence | | | | | | X | | |
| Obsessive-Compulsive Disorder | | | | | | | X | |
| Generalised Anxiety Disorder | | | | | | | | X |

After the assessment session the clinical research supervisor (a registered clinical psychologist) and therapist met to discuss the diagnosis. When co-morbidity was present the disorder with the highest degree of interference with the participant's life (as rated with the ISS) was chosen as the target disorder. The primary diagnosis then determined which manualised treatment approach was going to be used. Participants in the in-person condition began 'treatment as usual'. Participants in the videoconferencing condition were instructed to walk into the treatment room during their allotted time and sit in front of the computer. This arrangement ensured no further in-person contact between the therapist and participants in the videoconferencing condition after the initial assessment session. No

videoconferencing training for the participants was needed because they did not need to adjust or touch anything on the technology. All of the participant sessions were recorded so that the fidelity and credibility of the therapists' treatments could be monitored via supervision. The clinical research supervisor watched a minimum of 10% of each session to ensure that the therapist was adhering to the specified CBT treatment protocol. It was not possible for either the therapist or the supervisor to be blind to which condition the client was allocated.

The therapist in the study (author) did not have experience with telemental health prior to the commencement of the study. The therapist did, however, have personal experience communicating with relatives via videoconference. The supervising psychologist was experienced in conducting telemental health research and was used to mentor the treating therapist throughout the study.

Participants who took part in the study were offered 12 weekly one-hour sessions and an additional follow-up session six weeks after the 12th session. The questionnaires administered at pre-treatment (DASS, QLES-Q and an additional symptom specific measure) were again administered at post-treatment along with the relevant working alliance, satisfaction and treatment credibility measures. At follow-up, only the DASS and QLES-Q were used. The pre-treatment questionnaires were administered at home before attending the first treatment session. The post-treatment and follow-up questionnaires were administered in the clinic directly after the 12th and follow-up sessions respectively. When filling out the questionnaires the participants were alone in the therapy room. Of the participants that completed the full course of treatment (21), 17 were discharged from the clinic because they perceived themselves to be recovered (irrespective of the data obtained) and four were referred for further services at external agencies. The pre-treatment and post-treatment (12th session) data from the participant who took part in study two was also included in the data.

4.1.9 Design of Statistical Analysis

As discussed in the previous chapter (Section 3.6), the data was analysed using MLM with mixed effects linear regression. The analysis was conducted using the Statistical Package for Social Sciences program (SPSS) version 19 via the Generalised Linear Mixed Models (GLMM) procedure. Participants were treated as a nominal random effect. Time (pre, post and follow-up) was treated as an ordinal fixed effect and condition (in-person and videoconference) was treated as a nominal fixed

effect. Finally, participant measures of depression, anxiety, stress and quality of life were treated as scale outcomes. In order to optimise the likelihood of convergence, a separate GLMM analysis was run for each of the four scale outcome measures. The SPSS software was also used to conduct data screening, descriptive statistics, graphs, *t*-tests and *Chi-square* tests.

4.1.9.1 Power

Before conducting study one the initial statistical method proposed for study one was a 2 x 3 ANOVA, consequently the *a*-priori power analysis was based on this. With a predicted large effect size of $d = 0.5$, an alpha level of .05, desired power of .8 and a correlation of .6 between repetitions, the estimated total sample size using G-power (Erdfelder, Faul, & Buchner, 1996) was 26 (13 participants per condition). A large effect size was chosen because the change from pre to post-treatment for a mixed diagnosis client cohort in prior videoconferencing research (Day & Schneider, 2002) was large $d = .72$.

4.1.9.2 Effect Size

A meta-analysis calculator (Loyns & Morris 2012) was used that enables the *t* and *F* statistics generated from the MLM analysis to be converted into an estimated effect size corresponding to Cohen's *d* (Cohen, 1969). These calculations are conducted on the basis of the value of the statistic, the sample size, between-group degrees of freedom and the direction of the effect. For the *t*-tests that were not part of the MLM analysis the standard Cohen's *d* statistic (Cohen, 1969) was calculated for an independent *t*-test.

4.2 Results

This section of the chapter will begin by reporting the flow of participants and their attrition throughout study one. Following this the details of the preliminary data screening, descriptive statistics and assumption testing will be provided. The focus will then shift towards comparing the characteristics of the participants at pre-treatment and then reporting the sources used to calculate reliable change and clinical significance for the various measures. The findings pertaining to each hypothesis test and subsidiary analyses will then be provided. Section 4.2 will end with a brief summary of the results before moving onto the discussion.

4.2.1 Participant Flow

Figure 2 below shows the participant flow over the course of the study. In the videoconferencing condition, two of the participants only completed 10 sessions. The first only completed 10 sessions because he moved overseas and the second stated that she had done all the change she felt capable of doing at that time. Also in the videoconferencing condition, two of the participants were no longer eligible for inclusion in the study at follow-up. The first was no longer eligible because they required ongoing treatment after the post-treatment data had been collected and the second decided to begin medication in the final week of treatment. In the in-person condition one participant dropped out after nine sessions and no reason was given. Also in the in-person condition, one participant was no longer eligible to be included in the study at follow-up because they too commenced additional ongoing psychotherapy treatment after the initial 12-weeks of treatment in the study. The analyses were conducted twice, once with only the participants that completed all 12 sessions and once with all the participants that completed 10 or sessions. There were no significant differences between the two analyses therefore participants who completed eight or more sessions were included in the final analyses.

4.2.2 Attrition

Of the participants eligible to take part in the study 81% completed the full course of treatment. There were two participants in the in-person condition and three participants in the videoconferencing condition that did not complete the full course of treatment. However, one of the participants in the videoconferencing condition dropped out of the study because they moved overseas not because they wanted to discontinue treatment. The rate of attrition observed in this study (19%) is similar to what has been observed in prior CBT research trials (Hollon et al., 1992; McEvoy et al., 2012).

4.2.3 Missing Data

With regards to missing data, Figure 2 in Section 4.2.1 above indicates that post-treatment and follow-up data was missing for two of the participants in the in-person condition and for three of the participants in the videoconferencing condition. Follow-up data for the DASS scales was missing for two participants in the in-person

condition and two participants in the videoconferencing condition. One participant failed to complete the WAI for reasons unknown. Furthermore, due to a lack of emotional awareness one of the participants scored zero on all three DASS scales despite reporting severe clinical symptoms and rating moderate on the disorder specific measure, hence the scores were not included in the analyses pertaining to the DASS. However, this participant's scores were included in the analyses pertaining to quality of life and the disorder specific measures.

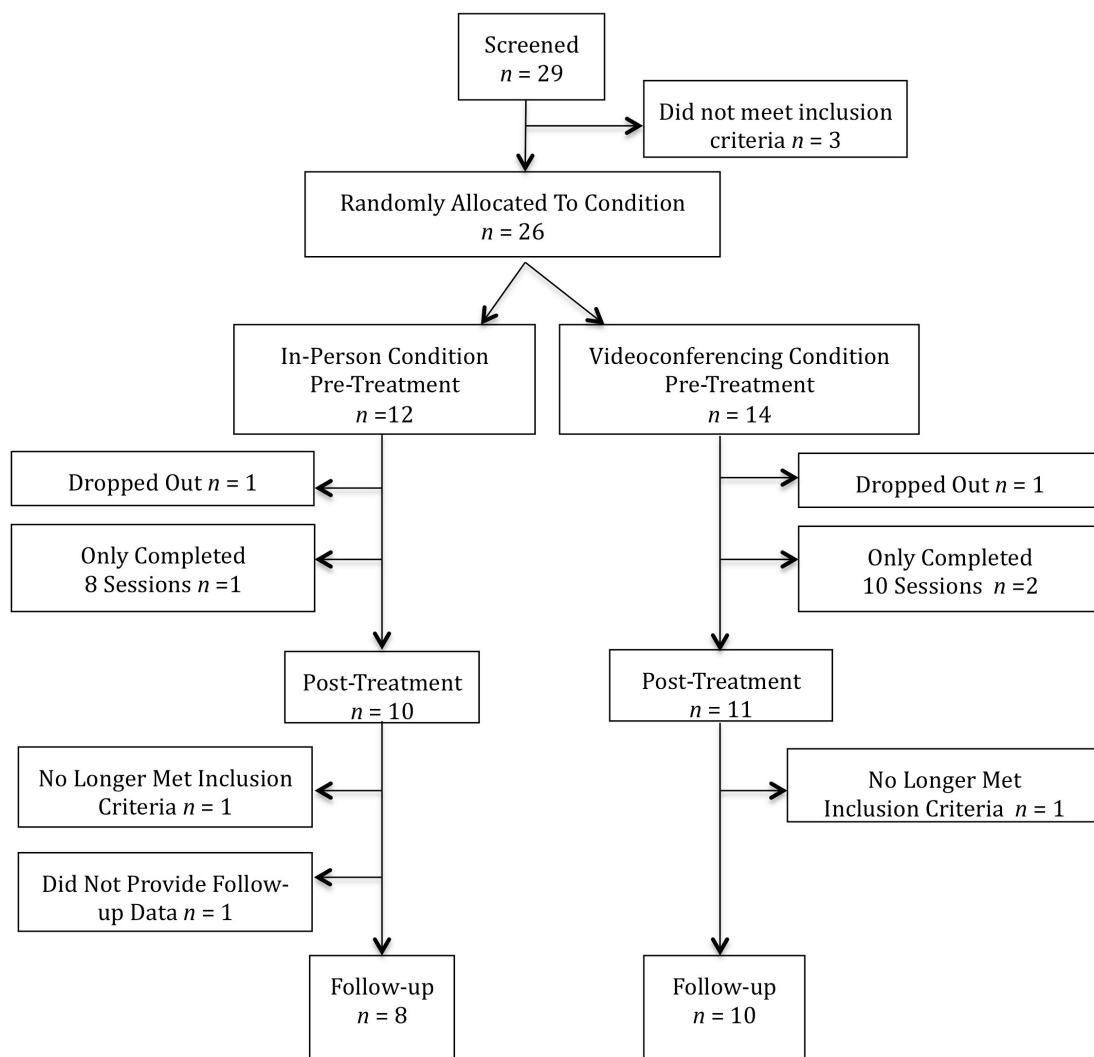


Figure 2. The number of participants and their flow throughout the study

No adjustments were made to compensate for missing data in MLM analyses as missing values can be tolerated within this procedure (Tabachnick & Fidell, 2007). Expectation maximisation was used to estimate missing values for *t*-tests. Preliminary screening of the demographics of participants at pre-treatment identified no missing

values. The credibility of therapy, working alliance: therapist, and client satisfaction measures each had two data points missing. The working alliance: client measure had three data points missing. For the measures that had missing data points the *t*-tests were conducted with and without the missing values and as the results were consistent only the results from the original data set are reported below.

Table 11

Descriptive Statistics For The Scale Measures In The In-person Condition

| Scale Measure | N | Mean | SD | Min | Max |
|-------------------------------|----|-------|-------|-------|-------|
| Depression Subscale Pre | 11 | 18.36 | 10.27 | 4 | 32 |
| Depression Subscale Post | 10 | 14.2 | 9.59 | 6 | 34 |
| Depression Subscale Follow-up | 7 | 9.43 | 7.46 | 2 | 22 |
| Anxiety Subscale Pre | 11 | 14.73 | 8.4 | 6 | 32 |
| Anxiety Subscale Post | 11 | 9.09 | 8.02 | 0 | 26 |
| Anxiety Subscale Follow-up | 8 | 7.75 | 6.63 | 0 | 18 |
| Stress Subscale Pre | 11 | 23.45 | 8.72 | 10 | 36 |
| Stress Subscale Post | 11 | 18.55 | 12.3 | 0 | 42 |
| Stress Subscale Follow-up | 8 | 13.75 | 9.65 | 0 | 34 |
| QLES-Q Pre | 12 | 3.38 | 0.76 | 2.06 | 4.88 |
| QLES-Q Post | 11 | 3.58 | 0.72 | 2.24 | 4.71 |
| QLES-Q Follow-up | 8 | 3.85 | 0.76 | 2.65 | 5.88 |
| Credibility Of Therapy | 11 | 34.14 | 3.73 | 25 | 38 |
| Working Alliance- Client | 11 | 6.14 | 0.45 | 5.5 | 7 |
| Working Alliance- Therapist | 11 | 5.89 | 0.41 | 4.92 | 6.417 |
| Client Satisfaction | 11 | 93.21 | 6.37 | 78.13 | 100 |

4.2.4 Descriptive Statistics

The descriptive statistics for the scale measures in the in-person condition are displayed in Table 11 and the descriptive statistics for the scale measures in the videoconferencing condition are displayed in Table 12.

Table 12

Descriptive Statistics For The Scale Measures In The Videoconferencing Condition

| Scale Measure | | N | Mean | SD | Min | Max |
|-----------------------------|-----------|----|-------|-------|------|------|
| Depression Subscale | Pre | 14 | 18.14 | 10.15 | 6 | 42 |
| | Post | 13 | 8.46 | 7.62 | 0 | 28 |
| | Follow-up | 9 | 5.11 | 5.93 | 0 | 18 |
| Anxiety Subscale | Pre | 14 | 13.43 | 8.96 | 0 | 26 |
| | Post | 13 | 8.62 | 7.63 | 2 | 26 |
| | Follow-up | 9 | 6.22 | 6.28 | 0 | 16 |
| Stress Subscale | Pre | 14 | 24.14 | 9.56 | 8 | 38 |
| | Post | 13 | 13.23 | 8.81 | 2 | 30 |
| | Follow-up | 9 | 8.89 | 5.58 | 0 | 18 |
| QLES-Q | Pre | 14 | 3.31 | 0.59 | 2.29 | 4.29 |
| | Post | 13 | 3.81 | 0.62 | 2.76 | 4.94 |
| | Follow-up | 9 | 4.15 | 0.51 | 3.41 | 4.88 |
| Credibility Of Therapy | | 13 | 34.69 | 4.52 | 23 | 40 |
| Working Alliance- Client | | 12 | 6.33 | 0.89 | 3.75 | 7 |
| Working Alliance- Therapist | | 13 | 5.74 | 0.83 | 3.58 | 6.75 |
| Client Satisfaction | | 13 | 94.23 | 10.04 | 65 | 100 |

4.2.5 Assumption Testing

5.2.5.1: DASS and QLES-Q MLM Analyses

For the MLM analysis that is used in this study many of the typical assumptions needed for statistical tests did not need to be met. For example, when using the GLMM in SPSS to test the relationship between fixed effects and the outcome measures the program can automatically select the appropriate probability distribution relevant for each outcome, hence normality is not a requirement. Furthermore, the probability distribution chosen by SPSS can be linked to the fixed effects with an appropriate linkage function, which means that linearity is not a requirement of the analyses. Also, the autoregressive covariance matrix was used for time instead of the default compound symmetry, consequently sphericity is not a requirement of the analysis. The analysis did not require homogeneity of variance or for the outcome variables to be normally distributed because the ‘robust statistics’

option in SPSS was used. Finally, multicollinearity was not an issue for the analysis because a separate analysis was run for each outcome variable thus optimizing the probability of convergence. MLM through the GLMM used in this manner is assumption free. However, in order to reduce the chances of a Type-1 error the Bonferroni correction was applied throughout the four MLM analyses. The corrected alpha level was .0125.

5.2.5.1: WA-Client, WA-Therapist, CSQ and CT t-test Analyses

The assumptions of the independent *t*-tests are normality, linearity and homogeneity of variance. Univariate descriptive statistics were used to initially assess the appropriateness of the data for the independent *t*-tests. Inspection of the histograms with normal curve overlay was inspected and no univariate outliers were identified. An examination of skewness, kurtosis and the Shapiro-Wilks test was conducted for each of the credibility of therapy, working alliance and client satisfaction variables. According to Keppel (1991) a univariate skew greater than ± 3 and a univariate kurtosis greater than ± 10 are considered problematic. Although none of the variables had skewness or kurtosis above these levels, the Shapiro-Wilks test was significant in several of the measures, (see Table 13). However, the Shapiro-Wilk statistic is a very sensitive measure of normality (Tabachnick & Fidell, 2007) therefore further inspection of the univariate histograms with a normal curve overlay was used to determine if transformation was required. Appendix E displays the univariate histograms with normal curve overlay for the variables that were identified as having a significant Shapiro-Wilk statistic. Visual inspection of these histograms indicates that the assumption of normality was violated with negative skewness on the WA-Client, the WA-Therapist and the CSQ measures in the videoconferencing condition. A logarithmic transformation was conducted on the WA-Client, the WA-Therapist and the CSQ measures in the videoconferencing condition and the analyses were conducted again. The results obtained from the transformed data did not lead to different findings from that obtained with the untransformed data, therefore the untransformed data was used. Inspection of the bivariate scatter plots indicated that the assumption of linearity was met. The Levene's test was non-significant in all of the *t*-tests therefore equal variances can be assumed.

4.2.6 Comparison of Participant Characteristics at Pre-Treatment

The following analyses were conducted in order to assess if the demographics and pre-treatment scores of the participants were significantly different between those in the in-person condition and those in the videoconferencing condition.

An independent samples *t*-test was conducted to compare the age of participants in the in-person condition ($M = 29.67, SD = 9.31$) and the videoconferencing condition ($M = 31.93, SD = 13.33$). There was a small non-significant difference between the mean ages of participants observed between conditions ($t(24) = -.493, p = .63$, two-tailed, 95% CI -11.73 to $7.21, d = -0.19$). This indicates that the age of participants was not statistically different between the two conditions.

Table 13

The Shapiro-Wilk Test Statistic of Normality for the Measures

| Measure | Level Of Significance In The In-Person Condition | Level Of Significance In The Videoconferencing Condition |
|-----------------------------|--|--|
| Credibility Of Therapy | .069 | .094 |
| Working Alliance- Client | .931 | .001* |
| Working Alliance- Therapist | .089 | .041* |
| Client Satisfaction | .103 | .000* |

Note. In the in-person condition $n = 11$ and in the videoconferencing condition $n = 13$

* $p < 0.05$

A Person's chi-square test of contingencies (with an $\alpha = .05$) was used to evaluate if gender was equally distributed across conditions. The chi-square test was not statistically significant $\chi^2(1, N = 26) = 0.004, p = .95$ and the association between gender and condition was very small $\phi = 0.01$. This indicates that gender was not unevenly distributed across condition.

Table 14

Sources of Normative Data Used To Calculate Reliable Change and Clinical Significance

| Outcome Measure | Population | Source | Mean | SD | Reliability |
|-----------------|----------------|--|-------|-------|-------------|
| DASS Depression | Disordered | Page, Hooke, and Morrison (2007) | 24.15 | 15.44 | .97 |
| | Non-Disordered | Zlomke (2009) | 8.5 | 8.6 | |
| DASS Anxiety | Disordered | Page et al., (2007) | 17.85 | 12.5 | .92 |
| | Non-Disordered | Zlomke (2009) | 7.79 | 8.17 | |
| DASS Stress | Disordered | Page et al., (2007) | 23.07 | 16.28 | .95 |
| | Non-Disordered | Zlomke (2009) | 12.8 | 8.96 | |
| QLES-Q | Disordered | Ritsner, Kurs, Gibel, Ratner, and Endicott (2005) | 3.4 | .8 | .91 |
| | Non-Disordered | Ritsner et al. (2005) | 4.2 | .4 | |
| BDI-II | Disordered | Bukley, Parker, and Heggie (2001) | 22.1 | 11.52 | .93 |
| | Non-Disordered | Dozois, Dobson, and Ahnber (1998) | 9.11 | 7.57 | |
| OCI-R | Disordered | Foa et al. (2002) | 28.01 | 13.53 | .90 |
| | Non-Disordered | Foa et al. (2002) | 18.82 | 11.1 | |
| ASI | Disordered | Bernstein et al. (2010) | 32.6 | 14.3 | .94 |
| | Non-Disordered | Bernstein et al. (2010) | 26.2 | 11 | |
| PSWQ | Disordered | Fresco et al. (2003) | 68.55 | 6.67 | |
| | Non-Disordered | Zlomke (2009) | 62.6 | 12.13 | .73 |
| BFNE | Disordered | Collins et al. (2005) | 51.5 | 7.3 | .97 |
| | Non-Disordered | Collins et al. (2005) | 29.2 | 8.2 | |
| HAQ | Disordered | Jackson, Kincey, Fiddler, Creed, and Tomenson (2004) | 17.3 | 9.2 | |
| | Non-Disordered | Ludcock and Morely (1996) | 8.6 | 8 | .82 |

Independent samples *t*-tests were conducted to analyse the difference between pre-treatment scores in the in-person and videoconferencing conditions. The descriptive statistics for the pre-treatment scores are displayed in Tables 11-12. The difference in pre-treatment scores between conditions was not significant on the

DASS depression subscale ($t(23) = .05, p = 0.96$, two-tailed, 95% CI -8.28 to 8.56) and the effect was very small ($d = 0.02$). The difference was not significant for DASS anxiety subscale ($t(23) = .37, p = .715$, two-tailed, 95% CI -5.981 to 8.568) and the effect was small ($d = 0.15$). The difference was not significant for the DASS stress subscale ($t(23) = .19, p = .854$, two-tailed, 95% CI -8.36 to 6.98) and the difference was very small ($d = -0.08$). The difference was also not significant for the QLES-Q ($t(24) = .282, p = .78$, two-tailed, 95% CI -0.47 to 0.62) and the difference was small ($d = 0.1$). These findings suggest that participant symptoms at pre-treatment were not statistically different between the two conditions, as indicated by these variables.

4.2.7 Statistics Used to Calculate Reliable Change and Clinical Significance

The purpose of hypotheses 3a-4b, 8a-9b, 13a-14b, 18a-19b and 21a-22b were to determine if the change in participant symptoms from pre to post-treatment and from pre-treatment to follow-up is reliable and clinically meaningful. Reliable change and clinical significance was calculated for all three DASS subscales (depression, anxiety and stress), QLES-Q and for each of the disorder specific measures relevant to each participant. According to Jacobson and Truax (1991), when normative data is available for both the disordered and the non-disordered population then criterion *c* should be used (see Section 3.6.1.3 for a further discussion of reliable change and clinical significance). Criterion *c* posits that participant's scores at post-treatment should fall closer to the mean of the non-disordered population than the mean of the disordered population. The normative data used to calculate reliable change and clinical significance is displayed above in Table 14 along with the sources from which the normative data was obtained.

4.2.8 Hypothesis Testing

Below are the details of the analyses conducted throughout study one to test the hypotheses. The descriptive statistics for the measures and time points are displayed above in Table 11-12. However, it should be noted that MLM uses the estimated standard means when conducting the pairwise comparisons, hence the relevant means are provided below in-text where appropriate. Hypotheses 1 to 5 are the first to be explored and they pertain to symptoms of depression.

4.2.8.1 Hypothesis Testing Pertaining To Research Question One

4.2.8.1.1 Hypotheses 1-5: Depression

4.2.8.1.1.1 Hypothesis 1

For Hypotheses 1-2 MLM with paired comparisons was used to investigate if time (pre, post and follow-up) and condition (in-person or videoconference) were significant predictors of participant scores on the DASS depression subscale. Participant was treated as a nominal random effect. Time (pre, post and follow-up) was treated as a ordinal fixed effect condition (in-person and videoconference) was treated as nominal fixed effects. Finally, participant measures of depression were treated as scale outcomes. For a visual representation of the hierarchical structure of the analysis please refer to Figure 1 in chapter three Section 3.6.1.2. The interaction between time and condition was not-significant ($p < .012$) for the DASS depression subscale ($F(2, 58) = 1.77, p = .18$) therefore the main effects can be interpreted without qualification.

The purpose of Hypothesis 1 is to determine if the CBT intervention was effective in reducing symptoms of depression across both the in-person and the videoconferencing condition. There was a significant main effect for time ($F(2, 58) = 14.47, p < .001$). The effect size ($d = 1.41$) indicates that time is a strong predictor of participant symptoms of depression and the effect is large. This finding supports Hypothesis 1 that overall the treatment provided throughout the study was successful in reducing participant symptoms of depression across time.

4.2.8.1.1.2 Hypothesis 1a

The purpose of Hypothesis 1a was to determine if depressive symptoms for participants in the in-person condition were significantly lower at post treatment than at pre treatment. On average, depression was lower in the in-person condition at post treatment ($M = 14.65, 95\% \text{ CI: } 9.04 \text{ to } 20.26$) than at pre treatment ($M = 18.36, 95\% \text{ CI: } 12.45 \text{ to } 24.27$). As can be seen in Table 15 this difference (3.71) was not statistically significant therefore Hypothesis 1a was not supported. However, the effect size was medium ($d = 0.34$).

Table 15

Pairwise Contrasts Across Time and Condition on the DASS Depression Subscale
(N = 25)

| Time | Condition | Mean Diff | t* | p | Lower | Upper | d |
|------------------|-----------------|-----------|------|---------|-------|-------|------|
| Pre - Post | In-Person | 3.71 | 1.49 | .140 | -1.28 | 8.70 | 0.34 |
| | Videoconference | 10.05 | 4.41 | <.001** | 5.49 | 14.62 | 1.02 |
| Post - Follow-up | In-Person | 4.27 | 1.70 | .094 | -0.76 | 9.30 | 0.39 |
| | Videoconference | 2.97 | 2.37 | .021** | 0.47 | 5.47 | 0.55 |
| Pre - Follow-up | In-Person | 7.98 | 2.47 | .016** | 1.52 | 14.44 | 0.57 |
| | Videoconference | 13.03 | 5.89 | <.001** | 8.60 | 17.46 | 1.36 |

*The degrees of freedom was 58 throughout

** Significant $p < 0.05$

4.2.8.1.1.3 Hypothesis 1b

The purpose of Hypothesis 1b was to determine if depressive symptoms for participants in the videoconferencing condition were significantly lower at post treatment than at pre treatment. On average, depression was lower in the videoconferencing condition at post treatment ($M = 8.09$, 95% CI: 2.25 to 7.98) than at pre treatment ($M = 18.14$, 95% CI: 12.91 to 22.38). As can be seen in Table 15 this difference (10.05) was statistically significant and the effect size was large ($d = 1.02$), therefore Hypothesis 1b was supported.

4.2.8.1.1.4 Hypothesis 1c

The purpose of Hypothesis 1c was to determine if depressive symptoms for participants in the in-person condition were significantly lower at follow-up than at post treatment. On average, depression was lower in the in-person condition at follow-up ($M = 10.38$, 95% CI: 5.27 to 15.49) than at post treatment ($M = 14.65$, 95% CI: 9.04 to 20.26). As can be seen in Table 15 this difference (4.27) was not statistically significant therefore Hypothesis 1c was not supported. However the effect size was medium ($d = 0.39$).

4.2.8.1.1.5 Hypothesis 1d

The purpose of Hypothesis 1d was to determine if depressive symptoms for participants in the videoconferencing condition were significantly lower at follow-up than at post treatment. On average, depression was lower in the videoconferencing condition at follow-up ($M = 5.12$, 95% CI: 2.25 to 7.98) than at post treatment ($M = 8.09$, 95% CI: 2.25 to 7.98). As can be seen in Table 15 this difference (10.05) was statistically significant therefore and the effect size was medium ($d = 0.55$), therefore Hypothesis 1d was supported.

4.2.8.1.1.6 Hypothesis 1e

The purpose of Hypothesis 1e was to determine if depressive symptoms for participants in the in-person condition were significantly lower at follow-up than at pre treatment. On average, participant rating of depression in the in-person condition were lower at follow-up ($M = 10.38$, 95% CI: 5.27 to 15.49) than at pre treatment ($M = 18.36$, 95% CI: 12.45 to 24.27). As can be seen in Table 15 this difference (7.98) was statistically significant and the effect size was medium ($d = 0.57$), therefore Hypothesis 1e was supported.

4.2.8.1.1.7 Hypothesis 1f

The purpose of Hypothesis 1f was to determine if depressive symptoms for participants in the videoconferencing condition were significantly lower at follow-up than at pre treatment. On average, participant rating of depression in the videoconferencing condition were lower at follow-up ($M = 5.12$, 95% CI: 2.25 to 7.98) than at pre treatment ($M = 18.14$, 95% CI: 12.91 to 22.38). As can be seen in Table 15 this difference (13.03) was statistically significant and the effect size was large ($d = 1.36$), therefore Hypothesis 1f was supported.

4.2.8.1.1.8 Hypothesis 2

The purpose of Hypothesis 2 was to evaluate if the reduction in depression scores across time differed significantly between conditions. The difference between conditions was not significant ($F(1, 58) = 1.98$ $p = .165$), therefore Hypothesis 2 was not supported. However, the effect size was medium ($d = 0.37$).

4.2.8.1.1.9 Hypothesis 3a- 4b

The purpose of Hypotheses 3a-4b was to evaluate if the proportion of participants meeting the criteria for reliable and clinically significant change in symptoms of depression from pre to post-treatment (and from pre-treatment to follow-up) was unequally distributed across conditions. It was hypothesised that a significantly greater proportion of participants would meet the criteria for reliable change and/or clinically significant change in the in-person condition than in the videoconferencing condition.

A Chi-square test of contingencies was planned to test these hypothesis. However, at least one of the expected cell frequencies for each analysis was below five therefore a chi square test of contingencies was not appropriate. Instead a 2 x 2 Fisher's exact test was used (Joosse, 2011). This issue pertaining to hypothesis 3a-4b also applied to hypotheses 8a-9b, 13a-14b, 18a-19b and 21a-22b.

Table 16

The Number of Participants in Each Condition Meeting Change Status Pertaining to Symptoms of Depression

| Change Status | Pre To Post Treatment | | Pre To Follow-Up Treatment | |
|--|-----------------------|-----------------|----------------------------|-----------------|
| | In-Person | Videoconference | In-Person | Videoconference |
| Reliable Change Not Evident | 6 | 5 | 3 | 1 |
| Reliable Change Clinically Significant | 4 | 8 | 4 | 8 |
| Change Not Evident | 7 | 7 | 4 | 2 |
| Clinically Significant Change | 3 | 6 | 3 | 7 |

The total number of participants that did or did not meet the respective criteria for reliable change and/or clinically significant change in either condition are displayed below in Table 16. These figures represent the total number of participants that met the respective criteria in each condition. The Fisher's Exact *p* from pre to post-treatment for both reliable change and clinically significant change was not

significant ($p = 0.414$ and $p = 0.669$ respectively). Nor was it significant from pre-treatment to follow-up ($p = 0.261$ and $p = 0.302$ respectively). Therefore hypotheses 3a to 4b were not supported.

4.2.8.1.1.10 Hypothesis 5

The purpose of Hypothesis 5 was to evaluate if CBT administered via videoconference is inferior to CBT administered in-person. Before Hypothesis 5 can be evaluated it is necessary to address if a formal hypothesis test of noninferiority is appropriate for this data set. As noted in Section 3.6.1.2, in order to calculate the sample size needed for a noninferiority trial several elements need to be selected, which include a level of confidence (alpha), the risk of a Type II error (power) and a margin of inferiority (Δ) (D'Agostino et al., 2003). However, as mentioned in chapter three, there is much debate on how best to determine Δ and estimates of sample size can vary depending on the how Δ is calculated. The Committee for Proprietary Medicinal Products (CPMP, 2000) asserts that when a trial is completed the confidence intervals around the mean change provides “a concrete assessment of the precision actually achieved, superseding any calculations of power carried out before the trial was undertaken” (p.6). Therefore this method will be used to determine the appropriateness of this data set for a non-inferiority analysis.

The mean difference and the lower limit of the 95% confidence interval from pre to post-treatment observed in this study on the DASS depression subscale in the in-person condition was -5 and -1.44 respectively. Using the one sided sample size calculation formula provided by Jones, Jarvis, Lewis, and Ebbutt (1996), 149 participants would be needed in each condition in order to have an 80% chance of detecting inferiority with 95% confidence that the lack of discrepancy observed did not occur by chance. However, given the sample size of 29 (26 who took completed the majority of treatment) obtained in this study, the discriminatory power in relation to a hypothesis test of non-inferiority would be approximately 50% (Jones et al., 1996). Hence, there was insufficient power to conduct a hypothesis test of noninferiority. Despite the lack of power to conduct a formal hypothesis test, the 95% confidence interval around the mean difference in the in-person condition can still be compared to the respective confidence interval in the videoconferencing condition. If the lower 95% confidence interval in the videoconferencing condition is within the

95% confidence interval of the mean in the in-person condition then this would suggest CBT via videoconference is not inferior to treatment provided in-person.

The 95% lower confidence limit around the mean change in the scores on the depression subscale of the DASS was analysed in both conditions. From pre to post treatment in the in-person condition it was -1.44 ($M = 5, SD = 10.14$) and in the videoconferencing condition it was 5.45 ($M = 10.29, SD = 8.37$). From pre-treatment to follow-up in the in-person condition it was -2.07 ($M = 8, SD = 10.89$) and in the videoconferencing condition it was 8.88 ($M = 14.89, SD = 7.82$). The graph below (Figure 3) depicts the upper and lower confidence limit of the 95% confidence intervals in both the in-person and videoconference-based condition across time. For each of the time points the reduction in participant symptoms of depression in the videoconferencing condition is not less than that of the in-person condition. Together these results provide preliminary evidence of non-inferiority of videoconference-based CBT compared to in-person with regards to elevating symptoms of depression. Thus on the basis of these findings, Hypothesis 5 was supported.

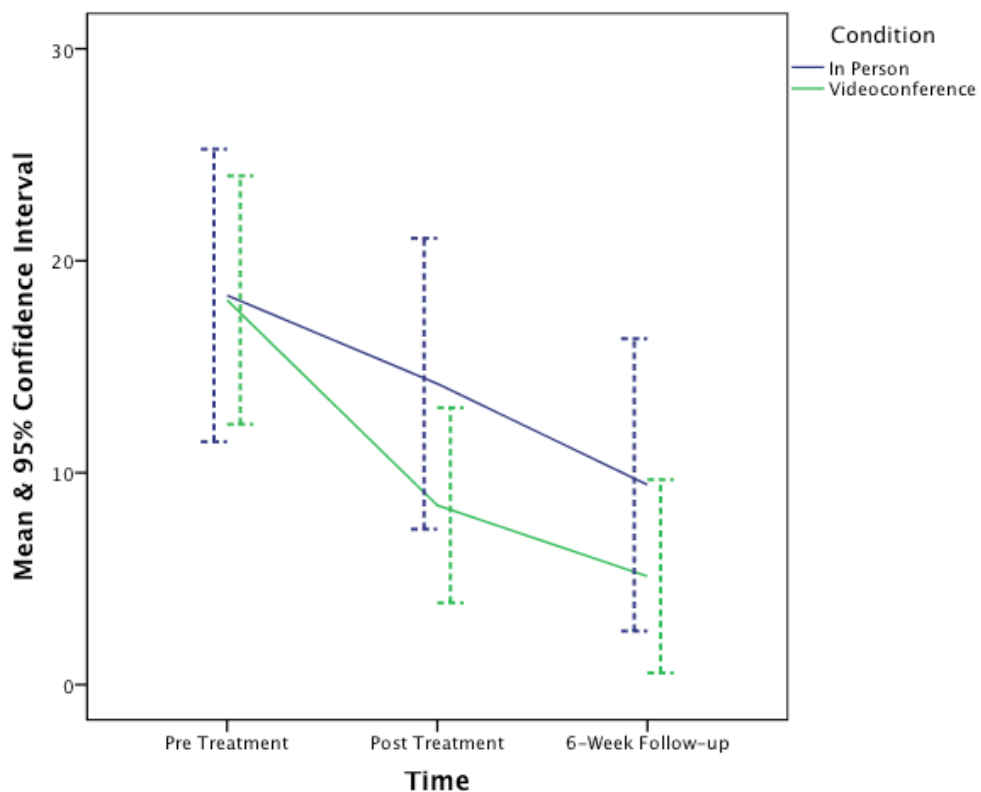


Figure 3. The change in symptoms of depression across time and condition

4.2.8.1.2 Hypothesis 6-10: Anxiety

4.2.8.1.2.1 Hypothesis 6

For Hypotheses 6-7 MLM with paired comparisons was used to investigate if time (pre, post and follow-up) and condition (in-person or videoconference) were significant predictors of participant scores on the DASS anxiety subscale. The interaction between time and condition was not-significant ($p < .0125$) for the DASS anxiety subscale ($F(2, 58) = 0.36, p = .70$) therefore the main effects can be interpreted without qualification.

The purpose of Hypothesis 6 is to determine if the CBT intervention was effective in reducing symptoms of anxiety across both the in-person and the videoconferencing condition. There was a significant main effect for time ($F(2, 58) = 9.34, p < .001$) and this effect was large ($d = 1.14$). This finding supports Hypothesis 6 that overall the treatment provided throughout the study was successful in reducing participant symptoms of anxiety.

4.2.8.1.2.2 Hypothesis 6a

The purpose of Hypothesis 6a was to determine if anxiety symptoms for participants in the in-person condition were significantly lower at post treatment than at pre treatment. On average, anxiety was lower in the in-person condition at post treatment ($M = 11.16, 95\% \text{ CI: } 6.06 \text{ to } 16.26$) than at pre treatment ($M = 14.72, 95\% \text{ CI: } 9.89 \text{ to } 19.56$). As can be seen in Table 17 this difference (3.56) was not statistically significant therefore Hypothesis 6a was not supported. However, the effect size was medium ($d = 0.36$).

4.2.8.1.2.3 Hypothesis 6b

The purpose of Hypothesis 6b was to determine if anxiety symptoms for participants in the videoconferencing condition were significantly lower at post treatment than at pre treatment. On average, anxiety was lower in the videoconferencing condition at post treatment ($M = 8.95, 95\% \text{ CI: } 4.98 \text{ to } 12.93$) than at pre treatment ($M = 13.43, 95\% \text{ CI: } 8.81 \text{ to } 18.05$). As can be seen in Table 17 this difference (4.47) was statistically significant and the effect size was medium ($d = 0.57$), therefore Hypothesis 6b was supported.

Table 17

Pairwise Contrasts Across Time and Condition on the DASS Anxiety Subscale
(N =25)

| Time | Condition | Mean Diff | t* | P | Lower | Upper | d |
|------------------|-----------------|-----------|------|--------|-------|-------|------|
| Pre - Post | In-Person | 3.56 | 1.57 | .123 | -0.99 | 8.12 | 0.36 |
| | Videoconference | 4.47 | 2.48 | .016** | 0.86 | 8.09 | 0.57 |
| Post - Follow-up | In-Person | 1.01 | 0.60 | .55 | -2.36 | 4.38 | 0.14 |
| | Videoconference | 2.13 | 1.57 | .12 | -0.58 | 4.84 | 0.36 |
| Pre - Follow-up | In-Person | 4.58 | 2.02 | .048** | 0.04 | 9.11 | 0.47 |
| | Videoconference | 6.60 | 5.24 | .001** | 4.08 | 9.13 | 1.21 |

*The degrees of freedom was 58 throughout

** Significant $p < 0.05$

4.2.8.1.2.4 Hypothesis 6c

The purpose of Hypothesis 6c was to determine if anxiety symptoms for participants in the in-person condition were significantly lower at follow-up than at post treatment. On average, anxiety was lower in the in-person condition at follow-up ($M = 10.15$, 95% CI: 5.81 to 14.49) than at post treatment ($M = 11.16$, 95% CI: 6.06 to 16.26). As can be seen in Table 17 this difference (1.01) was not statistically significant and the effect size was very small ($d = 0.14$), therefore Hypothesis 6c was not supported.

4.2.8.1.2.5 Hypothesis 6d

The purpose of Hypothesis 6d was to determine if anxiety symptoms for participants in the videoconferencing condition were significantly lower at follow-up than at post treatment. On average, anxiety was lower in the videoconferencing condition at follow-up ($M = 6.82$, 95% CI: 3.38 to 10.26) than at post treatment ($M = 8.95$, 95% CI: 4.98 to 12.93). As can be seen in Table 17 this difference (2.13) was not statistically significant therefore Hypothesis 6d was not supported. However, the effect size was medium ($d = 0.36$).

4.2.8.1.2.6 Hypothesis 6e

The purpose of Hypothesis 6e was to determine if anxiety symptoms for participants in the in-person condition were significantly lower at follow-up than at pre treatment. On average, anxiety was lower in the in-person condition at follow-up ($M = 10.15$, 95% CI: 5.81 to 14.49) than at pre treatment ($M = 14.72$, 95% CI: 9.89 to 19.56). As can be seen in Table 17 this difference (4.58) was statistically significant and the effect size was medium ($d = 0.47$), therefore Hypothesis 6e was supported.

4.2.8.1.2.7 Hypothesis 6f

The purpose of Hypothesis 6f was to determine if anxiety symptoms for participants in the videoconferencing condition were significantly lower at follow-up than at pre treatment. On average, anxiety was lower in the videoconferencing condition at follow-up ($M = 6.82$, 95% CI: 3.38 to 10.26) than at pre treatment ($M = 13.43$, 95% CI: 8.81 to 18.05). As can be seen in Table 17 this difference (6.60) was statistically significant and the effect size was large ($d = 1.21$), therefore Hypothesis 6f was supported.

4.2.8.1.2.8 Hypothesis 7

The purpose of Hypothesis 7 was to evaluate if the reduction in anxiety scores across time differed significantly between conditions. The difference between conditions was not significant ($F(1, 58) = 0.69$ $p = .41$) and the effect size was small ($d = 0.22$). Therefore Hypothesis 7 was not supported.

4.2.8.1.2.9 Hypothesis 8a-9b

The purpose of Hypothesis 8a-9b was to evaluate if the proportion of participants meeting the criteria for reliable change (and/or clinically significant change) in symptoms of anxiety from pre to post-treatment (and/or from pre-treatment to follow-up) was unequally distributed across condition. It was hypothesised that a significantly greater proportion of participants would meet the criteria for reliable change (and/or clinically significant change) in the in-person condition than in the videoconferencing condition.

Table 18

The Number of Clients In Each Condition Meeting Their Change Status Pertaining To Symptoms of Anxiety

| Change Status | Pre To Post Treatment | | Pre To Follow-Up Treatment | |
|---|-----------------------|-----------------|----------------------------|-----------------|
| | In-Person | Videoconference | In-Person | Videoconference |
| Reliable Change Not Evident | 9 | 10 | 5 | 7 |
| Reliable Change Clinically Significant | 1 | 3 | 2 | 2 |
| Change Not Evident Clinically Significant | 9 | 11 | 5 | 7 |
| Change | 1 | 2 | 2 | 2 |

The total number of participants that did or did not meet the respective criteria for reliable change and/or clinically significant change in either condition are displayed below in Table 18. These figures represent the total number of participants that met the respective criteria in each condition. Fisher's Exact p from pre to post-treatment for both reliable change and clinically significant change was not significant ($p = 0.603$ and $p > 0.999$ respectively). Nor was it significant from pre-treatment to follow-up ($p > 0.999$ and $p > 0.999$ respectively). Therefore hypotheses 8a to 9b were not supported.

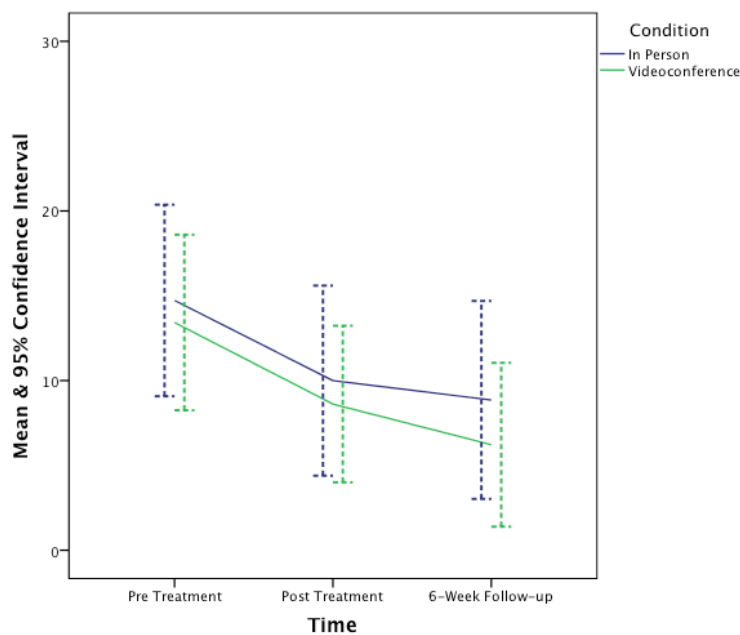


Figure 4. The change in symptoms of anxiety across time and condition

4.2.8.1.2.10 Hypothesis 10

The purpose of Hypothesis 10 was to evaluate if CBT administered via videoconference is inferior to CBT administered in-person in terms of outcomes on the anxiety measure. The 95% lower confidence limit (LBL) around the mean change in the scores on the anxiety subscale of the DASS was analysed in both conditions. From pre to post treatment in the in-person condition the LBL was -1.72 ($M = 5.17$, $SD = 10.84$) and in the videoconferencing condition it was 0.91 ($M = 5.43$, $SD = 8.37$). From pre-treatment to follow-up in the in-person condition the LBL was -1.88 ($M = 4.86$, $SD = 7.29$) and in the videoconferencing condition it was 4.57 ($M = 7.78$, $SD = 4.17$). The graph above (Figure 4) depicts the upper and lower limits of the 95% confidence intervals in both the in-person and videoconference-based condition. For each of the time points the reduction in participant symptoms of anxiety in the videoconferencing condition is not less than that of the in-person condition. Together these results provide preliminary evidence of non-inferiority of videoconference-based CBT compared to in-person with regards to elevating symptoms of anxiety. Thus on the basis of these findings, Hypothesis 10 was supported.

4.2.8.1.3 Hypothesis 11-15: Stress

4.2.8.1.3.1 Hypothesis 11

For Hypotheses 11-12 MLM with paired comparisons was used to investigate if time (pre, post and follow-up) and condition (in-person or videoconference) were significant predictors of participant scores on the DASS stress subscale. The interaction between time and condition was not-significant ($p < .0125$) for the DASS stress subscale ($F(2, 58) = 4.19$, $p = .02$) therefore the main effects can be interpreted without qualification.

The purpose of Hypothesis 11 was to determine if the CBT intervention was effective in reducing symptoms of stress across both the in-person and the videoconferencing condition. There was a significant main effect for time ($F(2, 58) = 23.70$, $p < .001$) and the effect was large ($d = 1.81$). This finding supports Hypothesis 11 that overall the treatment provided throughout the study was successful in reducing participant symptoms of stress.

4.2.8.1.3.2 Hypothesis 11a

The purpose of Hypothesis 11a was to determine if stress symptoms for participants in the in-person condition were significantly lower at post treatment than at pre treatment. On average, stress was lower in the in-person condition at post treatment ($M = 20.85$, 95% CI: 14.33 to 27.29) than at pre treatment ($M = 23.44$, 95% CI: 18.43 to 28.47). As can be seen in Table 19 this difference (2.59) was not statistically significant therefore Hypothesis 11a was not supported. However, a small effect size was observed ($d = 0.25$).

4.2.8.1.3.3 Hypothesis 11b

The purpose of Hypothesis 11b was to determine if stress symptoms for participants in the videoconferencing condition were significantly lower at post treatment than at pre treatment. On average, stress was lower in the videoconferencing condition at post treatment ($M = 13.114$, 95% CI: 8.57 to 17.66) than at pre treatment ($M = 24.14$, 95% CI: 19.22 to 29.07). As can be seen in Table 19 this difference (11.03) was statistically significant and the effect size was large ($d = 1.19$), therefore Hypothesis 11b was supported.

Table 19

Pairwise Contrasts Across Time and Condition on the DASS Stress Subscale
($N = 25$)

| Time | Condition | Mean Diff | t* | p | Lower | Upper | d |
|------------------|-----------------|-----------|------|---------|-------|-------|------|
| Pre - Post | In-Person | 2.59 | 1.24 | .219 | -1.58 | 6.76 | 0.25 |
| | Videoconference | 11.03 | 5.17 | <.001** | 6.76 | 15.30 | 1.19 |
| Post - Follow-up | In-Person | 3.66 | 2.29 | .026** | 0.45 | 6.88 | 0.53 |
| | Videoconference | 2.93 | 2.52 | .015** | 0.60 | 5.25 | 0.58 |
| Pre - Follow-up | In-Person | 6.26 | 2.92 | .005** | 1.97 | 10.54 | 0.67 |
| | Videoconference | 13.95 | 6.74 | <.001** | 9.81 | 18.09 | 1.55 |

*The degrees of freedom was 58 throughout

** Significant $p < 0.05$

4.2.8.1.3.4 Hypothesis 11c

The purpose of Hypothesis 11c was to determine if stress symptoms for participants in the in-person condition were significantly lower at follow-up than at post treatment. On average, stress was lower in the in-person condition at follow-up ($M = 17.20$, 95% CI: 12.02 to 22.38) than at post treatment ($M = 20.85$, 95% CI: 14.33 to 27.29). As can be seen in Table 19 this difference (3.66) was not statistically significant therefore Hypothesis 11c was not supported. However, the effect size was medium ($d = 0.53$).

4.2.8.1.3.5 Hypothesis 11d

The purpose of Hypothesis 11d was to determine if stress symptoms for participants in the videoconferencing condition were significantly lower at follow-up than at post treatment. On average, stress was lower in the videoconferencing condition at follow-up ($M = 10.19$, 95% CI: 6.37 to 14.01) than at post treatment ($M = 13.114$, 95% CI: 8.57 to 17.66). As can be seen in Table 19 this difference (2.93) was statistically significant and the effect size was medium ($d = 0.58$), therefore Hypothesis 11d was supported.

4.2.8.1.3.6 Hypothesis 11e

The purpose of Hypothesis 11e was to determine if stress symptoms for participants in the in-person condition were significantly lower at follow-up than at pre treatment. On average, stress was lower in the in-person condition at follow-up ($M = 17.20$, 95% CI: 12.02 to 22.38) than at pre treatment ($M = 23.44$, 95% CI: 18.43 to 28.47). As can be seen in Table 19 this difference (6.26) was statistically significant and the effect size was medium ($d = 0.67$), therefore Hypothesis 11e was supported.

4.2.8.1.3.7 Hypothesis 11f

The purpose of Hypothesis 11f was to determine if stress symptoms for participants in the videoconferencing condition were significantly lower at follow-up than at pre treatment. On average, stress was lower in the videoconferencing condition at follow-up ($M = 10.19$, 95% CI: 6.37 to 14.01) than at pre treatment ($M = 24.14$, 95% CI: 19.22 to 29.07). As can be seen in Table 19 this difference (13.95) was statistically significant and the effect size was medium ($d = 1.55$), therefore Hypothesis 11f was supported.

4.2.8.1.3.8 Hypothesis 12

The purpose of Hypothesis 12 was to evaluate if the reduction in stress scores across time differed significantly between conditions. The difference between conditions was not significant ($F(1, 58) = 2.11, p = .152$) therefore Hypothesis 12 was not supported. However a medium effect size was observed ($d = 0.38$) indicating that that condition is a moderate predictor of participant symptoms of stress in favour of the videoconferencing condition.

4.2.8.1.3.9 Hypothesis 13a-14b

The purpose of Hypothesis 13a-14b was to evaluate if the proportion of participants meeting the criteria for reliable change (and/or clinically significant change) in symptoms of stress from pre to post-treatment (and/or from pre-treatment to follow-up) was unequally distributed across condition. It was hypothesised that a significantly greater proportion of participants would meet the criteria for reliable change (and/or clinically significant change) in the in-person condition than in the videoconferencing condition.

Table 20

The Number of Participants In Each Condition Meeting Their Change Status Pertaining To Symptoms of Stress

| Change Status | Pre To Post Treatment | | Pre To Follow-Up Treatment | |
|---|-----------------------|-----------------|----------------------------|-----------------|
| | In-Person | Videoconference | In-Person | Videoconference |
| Reliable Change Not Evident | 8 | 4 | 5 | 1 |
| Reliable Change | 2 | 9 | 2 | 8 |
| Clinically Significant Change Not Evident | 8 | 6 | 5 | 2 |
| Clinically Significant Change | 2 | 7 | 2 | 7 |

The total number of participants that did or did not meet the respective criteria for reliable change and/or clinically significant change in either condition are

displayed below in Table 20. These figures represent the total number of participants that met the respective criteria in each condition. Fisher Exact p from pre to post-treatment for reliable change was significant ($p = 0.036$) but it was in favour of the videoconferencing condition. Therefore hypothesis 13a was not supported. Fisher Exact p from pre-treatment to follow-up for reliable change was significant ($p = 0.035$) but also in favour of the videoconferencing condition. Therefore hypothesis 14a was not supported. Fisher Exact p from pre to post-treatment and from pre-treatment to follow-up for clinically significant change were both not significant ($p = 0.197$ and $p = 0.126$ respectively). Therefore hypotheses 13b and 14b were not supported.

4.2.8.1.3.10 Hypothesis 15

The purpose of Hypothesis 15 was to evaluate if CBT administered via videoconference is inferior to CBT administered in-person. The 95% lower confidence limit (LBL) around the mean change in the scores on the stress subscale of the DASS was analysed in both conditions. From pre to post treatment in the in-person condition the LBL was -1.98 ($M = 4.5$, $SD = 10.2$) and in the videoconferencing condition it was 7.05 ($M = 11.86$, $SD = 8.32$). From pre-treatment to follow-up in the in-person condition the LBL was -0.5 ($M = 6.29$, $SD = 7.34$) and in the videoconferencing condition it was 8.91 ($M = 14.67$, $SD = 7.48$). The graph below (Figure 5) depicts the upper and lower limit of the 95% confidence intervals in both the in-person and videoconference-based condition across time. For each of the time points the reduction in participant symptoms of stress in the videoconferencing condition is not less than that of the in-person condition. Together these results provide preliminary evidence of non-inferiority of videoconference-based CBT compared to in-person with regards to elevating symptoms of anxiety. Thus on the basis of these findings, Hypothesis 15 was supported.

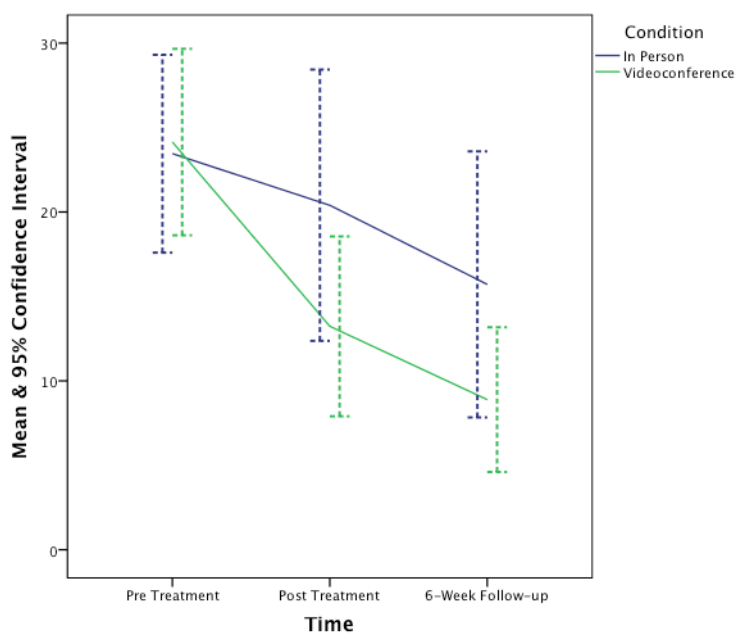


Figure 5. The change in symptoms of stress across time and condition

4.2.8.1.4 Hypothesis 16-20: Quality of Life

4.2.8.1.4.1 Hypothesis 16¹

For Hypotheses 16-17 MLM with paired comparisons was used to investigate if time (pre, post and follow-up) and condition (in-person or videoconference) were significant predictors of participant ratings on the QLES-Q. The interaction between time and condition was not-significant ($p < .0125$) for the QLES-Q ($F(2, 62) = 0.82, p = .45$) therefore the main effects can be interpreted without qualification.

The purpose of Hypothesis 16 was to determine if the CBT intervention was effective in increasing quality of life in both the in-person and the videoconferencing condition. There was a significant main effect for time ($F(2, 62) = 10.64, p < .001$) and this effect was large ($d = 1.17$). This finding supports Hypothesis 16 that overall the treatment provided throughout the study was successful at increasing participants' quality of life.

4.2.8.1.4.2 Hypothesis 16a

The purpose of Hypothesis 16a was to determine if quality of life for participants in the in-person condition was significantly higher at post treatment than

¹ For an unknown reason the MLM analysis on the QLES-Q was unable to compute using the mean score for each client. However, there were no statistical problems when using the sum of client scores across the QLES-Q, therefore the sum was used in the QLES-Q analyses instead of the mean.

at pre treatment. On average, quality of life was higher in the in-person condition at post treatment ($M = 60.81$, 95% CI: 54.09 to 67.54) than at pre treatment ($M = 57.50$, 95% CI: 50.37 to 64.62). As can be seen in Table 21 this difference (-3.32) was not statistically significant therefore Hypothesis 16a was not supported. However, a small effect size was observed ($d = 0.27$).

Table 21

Pairwise Contrasts Across Time and Condition on the QLES-Q
($N = 26$)

| Time | Condition | Mean Diff | t* | p | Lower | Upper | d |
|------------------|-----------------|-----------|-------|---------|--------|-------|------|
| Pre - Post | In-Person | -3.32 | -1.24 | .220 | -8.66 | 2.03 | 0.27 |
| | Videoconference | -7.12 | -2.99 | .004** | -13.13 | -2.61 | 0.65 |
| Post - Follow-up | In-Person | -3.81 | -1.76 | .084 | -8.14 | 0.53 | 0.38 |
| | Videoconference | -4.18 | -2.27 | .026** | -7.85 | -0.51 | 0.49 |
| Pre - Follow-up | In-Person | -7.12 | -2.09 | .041** | 0.30 | 13.94 | 0.45 |
| | Videoconference | -12.05 | -4.92 | <.001** | -16.94 | -7.15 | 1.06 |

*The degrees of freedom was 58 throughout

** Significant $p < 0.05$

4.2.8.1.4.3 Hypothesis 16b

The purpose of Hypothesis 16b was to determine if quality of life for participants in the videoconferencing condition was significantly higher at post treatment than at pre-treatment. On average, quality of life was higher in the videoconferencing condition at post treatment ($M = 64.12$, 95% CI: 58.49 to 69.76) than at pre treatment ($M = 56.25$, 95% CI: 51.02 to 61.49). As can be seen in Table 21 this difference (-7.12) was statistically significant and the effect size was medium ($d = 0.65$), therefore Hypothesis 16b was supported.

4.2.8.1.4.4 Hypothesis 16c

The purpose of Hypothesis 16c was to determine if quality of life for participants in the in-person condition was significantly higher at follow-up than at post treatment. On average, quality of life was higher in the in-person condition at follow-up ($M = 64.62$, 95% CI: 57.85 to 71.39) than at post treatment ($M = 60.81$,

95% CI: 54.09 to 67.54). As can be seen in Table 21 this difference (-3.81) was not statistically significant therefore Hypothesis 16c was not supported. However the effect size was medium ($d = 0.38$).

4.2.8.1.4.5 Hypothesis 16d

The purpose of Hypothesis 16d was to determine if quality of life for participants in the videoconferencing condition was significantly higher at follow-up than at post treatment. On average, quality of life was higher in the videoconferencing condition at follow-up ($M = 68.10$, 95% CI: 63.41 to 73.18) than at post treatment ($M = 64.12$, 95% CI: 58.49 to 69.76). As can be seen in Table 21 this difference (-4.18) was statistically significant and the effect size was medium ($d = 0.49$), therefore Hypothesis 16d was supported.

4.2.8.1.4.6 Hypothesis 16e

The purpose of Hypothesis 16e was to determine if quality of life for participants in the in-person condition was significantly higher at follow-up than at pre treatment. On average, quality of life was higher in the in-person condition at follow-up ($M = 64.62$, 95% CI: 57.85 to 71.39) than at pre treatment ($M = 57.50$, 95% CI: 50.37 to 64.62). As can be seen in Table 21 this difference (-7.12) was statistically significant and the effect size was medium ($d = 0.45$), therefore Hypothesis 16e was supported.

4.2.8.1.4.7 Hypothesis 16f

The purpose of Hypothesis 16f was to determine if quality of life symptoms for participants in the videoconferencing condition were significantly higher at follow-up than at pre treatment. On average, quality of life was higher in the videoconferencing condition at follow-up ($M = 68.10$, 95% CI: 63.41 to 73.18) than at pre treatment ($M = 56.25$, 95% CI: 51.02 to 61.49). As can be seen in Table 21 this difference (-12.05) was statistically significant and the effect size was large ($d = 1.06$), therefore Hypothesis 16f was supported.

4.2.8.1.4.8 Hypothesis 17

The purpose of Hypothesis 17 was to evaluate if the improvement in quality of life across time differed significantly between conditions. The difference between

conditions was not significant ($F(1, 62) = 0.25, p = .616$) and the effect size was very small ($d = 0.13$). Therefore Hypothesis 17 was not supported.

4.2.8.1.4.9 Hypothesis 18a-19b

The purpose of Hypothesis 18a-19b was to evaluate if the proportion of participants meeting the criteria for reliable change (and/or clinically significant change) in quality of life from pre to post-treatment (and/or from pre-treatment to follow-up) was unequally distributed across condition. It was hypothesised that a significantly greater proportion of participants would meet the criteria for reliable change (and/or clinically significant change) in the in-person condition than in the videoconferencing condition.

The total number of participants that did or did not meet the respective criteria for reliable change and/or clinically significant change in either condition are displayed below in Table 22. These figures represent the total number of participants that met the respective criteria in each condition. Fisher Exact p from pre to post-treatment for both reliable change and clinically significant change was not significant ($p = 0.649$ and $p > 0.999$ respectively). Nor was it significant from pre-treatment to follow-up ($p > 0.999$ and $p = 0.619$ respectively). Therefore hypotheses 18a to 19b were not supported.

Table 22

The Number of Participants In Each Condition Meeting Their Change Status Pertaining To Symptoms of Quality of Life

| Change Status | Pre To Post Treatment | | Pre To Follow-Up Treatment | |
|---|-----------------------|-----------------|----------------------------|-----------------|
| | In-Person | Videoconference | In-Person | Videoconference |
| Reliable Change Not Evident | 9 | 9 | 5 | 5 |
| Reliable Change Clinically Significant | 2 | 4 | 3 | 4 |
| Change Not Evident Clinically Significant | 9 | 11 | 5 | 6 |
| Change | 2 | 2 | 3 | 3 |

4.2.8.1.4.10 Hypothesis 20

The purpose of Hypothesis 20 is to evaluate if CBT administered via videoconference was inferior to CBT administered in-person with regards to participant symptoms of quality of life. The 95% lower confidence limit (LBL) around the mean change in the scores on the QLES-Q was analysed in both conditions. From pre to post treatment in the in-person condition the LBL was -9.82 ($M = -3.45$, $SD = 9.47$) and in the videoconferencing condition it was -13.59 ($M = -7.61$, $SD = 9.88$). From pre-treatment to follow-up in the in-person condition the LBL was -16.78 ($M = -7.44$, $SD = 12.15$) and in the videoconferencing condition it was -19.95 ($M = -12.67$, $SD = 9.47$). The graph below (Figure 6) depicts the upper and lower limits of the 95% confidence intervals in both the in-person and videoconference-based condition. For each of the time points the increase in participant quality of life in the videoconferencing condition is not less than that of the in-person condition. These results provide preliminary evidence of non-inferiority of videoconference-based CBT compared to in-person with regards to elevating improvement in quality of life. Thus on the basis of these findings, Hypothesis 20 was supported.

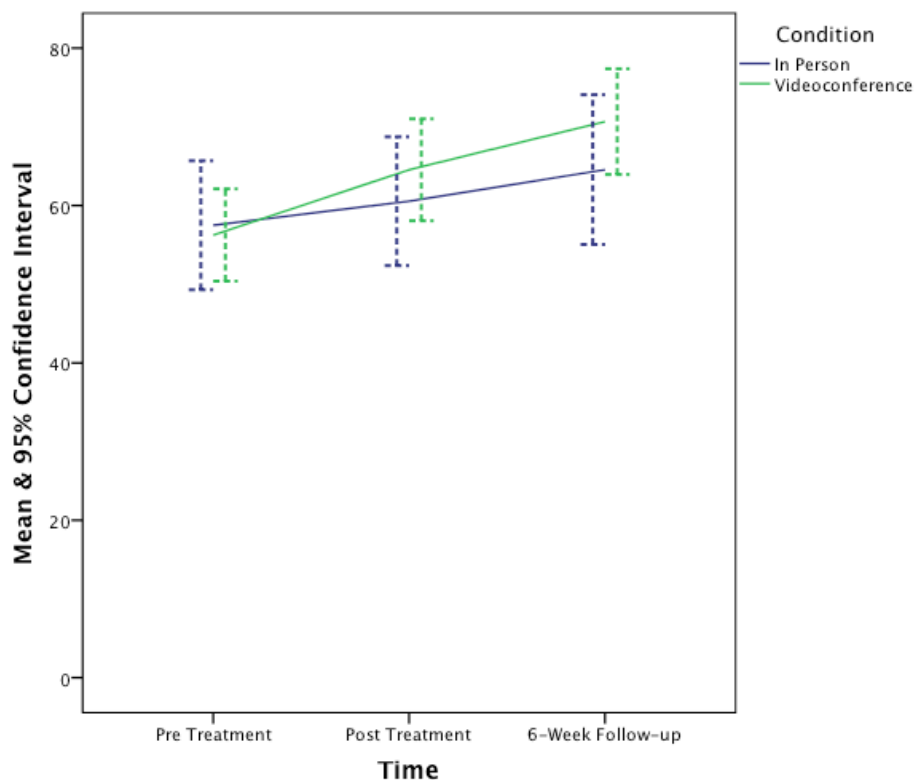


Figure 6. The change in quality of life across time and condition

4.2.8.1.5 Hypothesis 21a-22b: Disorder Specific Measures

The purpose of Hypothesis 21a-22b was to evaluate if the proportion of participants meeting the criteria for reliable change (and/or clinically significant change) across the disorder specific measures from pre to post-treatment (and/or from pre-treatment to follow-up) was unequally distributed across condition. It was hypothesised that a significantly greater proportion of participants would meet the criteria for reliable change (and/or clinically significant change) in the in-person condition than in the videoconferencing condition.

The total number of participants that did or did not meet the respective criteria for reliable change and/or clinically significant change in either condition are displayed below in Table 23. These figures represent the total number of participants that met the respective criteria in each condition. The p value from pre to post-treatment for both reliable change and clinically significant change was not significant ($p > 0.999$ and $p > 0.999$ respectively). Nor was the p value from pre-treatment to follow-up ($p = 0.294$ and $p = 0.131$ respectively). Therefore hypotheses 22a to 22b were not supported.

Table 23

The Number of Participants In Each Condition Meeting Their Change Status
Pertaining To The Disorder Specific Measures

| Change Status | Pre To Post Treatment | | Pre To Follow-Up Treatment | |
|---|-----------------------|-----------------|----------------------------|-----------------|
| | In-Person | Videoconference | In-Person | Videoconference |
| Reliable Change Not Evident | 3 | 3 | 3 | 1 |
| Reliable Change Clinically Significant | 8 | 10 | 5 | 8 |
| Change Not Evident Clinically Significant | 3 | 4 | 4 | 1 |
| Change | 7 | 9 | 4 | 8 |

Table 24

Rates of Clinical Improvement from Pre to Post-treatment and Follow-up for the DASS

| Clinical Status | Pre-Post | | | | | |
|----------------------------|------------|-------|-----------|-------|-----------|-------|
| | Depression | | Anxiety | | Stress | |
| | In-Person | Video | In-Person | Video | In-Person | Video |
| Recovered | 30% | 46% | 10% | 15% | 20% | 54% |
| Improved | 40% | 62% | 10% | 23% | 20% | 69% |
| Unchanged | 60% | 30% | 90% | 77% | 80% | 31% |
| Deteriorated | None | 8% | None | None | None | None |
| Pre-Treatment To Follow-up | | | | | | |
| Recovered | 43% | 77% | 29% | 22% | 29% | 77% |
| Improved | 56% | 89% | 29% | 22% | 29% | 89% |
| Unchanged | 43% | 11% | 71% | 78% | 71% | 11% |
| Deteriorated | None | None | None | None | None | None |

Note. $N = 25$

4.2.8.1.6 Summary Of Reliable Change and Clinical Significance

As noted in chapter three Section 3.6.1.3, reliable change and clinical significance calculations can be used to classify participants as either *recovered* (clinically significant change and reliable change), *improved* (reliable change only), *unchanged* (reliable change was not evident) or *deteriorated* (reliable change but in the undesired direction) (Jacobson & Truax, 1991). Therefore Table 24-26 provides a summary of the findings of hypotheses 3a-4b, 8a-9b, 13a-14b, 18a-19b and 21a-22b, presented above, in accordance with Jacobson and Truax (1991) classification criteria. Table 24 displays the percentage of participants in each condition that met the respective criteria on each of the DASS subscales from pre to post-treatment and from pre-treatment to follow-up. Similarly, Table 25 displays the relevant percentages pertaining to the QLES-Q and Table 26 displays the percentages pertaining to the disorder specific measures.

Table 25

Rates of Clinical Improvement from Pre to Post-treatment and Follow-up for the QLES-Q

| Clinical Status | Pre To Post Treatment | | Pre To Follow-Up Treatment | |
|-----------------|-----------------------|-----------------|----------------------------|-----------------|
| | In-Person | Videoconference | In-Person | Videoconference |
| Recovered | 18% | 15% | 38% | 33% |
| Improved | 18% | 31% | 38% | 44% |
| Unchanged | 82% | 69% | 62% | 56% |
| Deteriorated | None | None | 11% | None |

Note. $N = 26$

4.2.8.2 Hypothesis Testing Pertaining To Research Question Two

The purpose of Hypothesis 23 was to evaluate if participants in the videoconferencing condition rated the working alliance as significantly worse than participants in the in-person condition. An independent samples t -test indicated that the difference between the participant ratings of the working alliance in the in-person condition ($M = 6.14$, $SD = .45$) and the videoconferencing condition ($M = 6.33$, $SD = .89$) was not significant ($t(21) = -.635$, $p = .53$, two-tailed, $d = -.26$). Using Cohen's (1969) conventions, the effect size indicates a small difference between conditions in favour of the videoconferencing condition. These findings indicate that Hypothesis 23 was not supported.

Table 26

Rates of Clinical Improvement Across Time for the Disorder Specific Measures

| Clinical Status | Pre To Post Treatment | | Pre To Follow-Up Treatment | |
|-----------------|-----------------------|-----------------|----------------------------|-----------------|
| | In-Person | Videoconference | In-Person | Videoconference |
| Recovered | 70% | 69% | 50% | 89% |
| Improved | 70% | 77% | 63% | 89% |
| Unchanged | 30% | 23% | 27% | 11% |
| Deteriorated | None | None | None | None |

Note. $N = 26$

4.2.8.3 Hypothesis Testing Pertaining To Research Question Three

The purpose of Hypothesis 24 was to evaluate if the therapist rated the working alliance in the videoconferencing condition as significantly worse than in the in-person condition. An independent samples *t*-test was used to test this hypothesis. The analysis indicated that the difference between the participant ratings of the working alliance in the in-person condition ($M = 5.89, SD = .41$) and the videoconferencing condition ($M = 5.74, SD = .82$) was not significant ($t(22) = .526, p = .60$, two-tailed, $d = .23$). Using Cohen's (1969) conventions, the effect size indicates a small difference between conditions in favour of the in-person condition. These findings indicate that Hypothesis 24 was not supported.

4.2.8.4 Hypothesis Testing Pertaining To Research Question Four

The purpose of Hypothesis 25 was to evaluate if the participants in the videoconferencing condition rated their satisfaction with the services as significantly worse than participants in the in-person condition. An independent samples *t*-test was used to test this hypothesis. The results indicated that the difference between the participant ratings of satisfaction in the in-person condition ($M = 93.21, SD = .637$) and the videoconferencing condition ($M = 94.23, SD = .10.04$) was not significant ($t(22) = -.29, p = .77$, two-tailed, $d = -.12$). Using Cohen's (Cohen, 1969) conventions, the effect size indicates a small difference between conditions in favour of the videoconferencing condition. These findings indicate that Hypothesis 25 was not supported.

4.2.8.5 Hypothesis Testing Pertaining To Research Question Five

The purpose of Hypothesis 26 was to evaluate if participant satisfaction with the videoconferencing technology was high. Participants in the videoconference-based condition that completed 10 or more sessions were included in the TSQ analysis ($N = 13$). Scores ranged from 61.4% to a 100% satisfaction, with a mean of 90.44% and a *SD* of 11.11%. Furthermore, only four of the participants scored less than 90% satisfaction. These findings indicate that the majority of participants who received psychological services via videoconference were highly satisfied (operationalized as above 80% satisfaction rating) with the technology. Hypothesis 26 was supported.

4.2.8.6 Hypothesis Testing Pertaining To Research Question Six

The purpose of Hypothesis 27 was to evaluate if participants in both the in-person condition and the videoconferencing condition found treatment to be credible. An independent samples *t* test was used to compare the participants' ratings on the CTQ in the in-person condition ($n = 11$) to the videoconference-based condition ($n = 13$). There was no significant difference between the mean treatment credibility rating in the in-person condition 34.14 ($SD = 3.72$) and the videoconferencing condition 34.69 ($SD = 4.52$) ($t(22) = -.75, p = .75$, two-tailed, $d = .13$). Using Cohen's (1969) conventions, this effect size is very small, indicating little difference in participant perceptions of treatment credibility. These findings indicate that Hypothesis 27 was not supported.

4.2.9 Results Summary

In summary, there were four main findings. First, the results indicate that depression, anxiety and stress significantly reduced across Time in both treatment conditions, while quality of life increased. Second, for all four symptom-measures the effect size of the paired comparison from pre-treatment to follow-up was large in the videoconferencing condition and medium in the in-person condition. Third, the preliminary non-inferiority suggest that that CBT via videoconference does not result in clinical outcomes that are inferior to CBT administered in-person. Fourth, for the non-symptoms measures (working alliance- client, working alliance- therapist, client satisfaction and credibility of therapy) the difference between conditions was not significant with effect sizes ranging from very small to small.

4.3 Discussion

This study is, to the author's knowledge, the first CBT videoconferencing RCT involving an adult population that has been conducted in Australia. Furthermore, this study is the first to specifically focus on the effectiveness of CBT via videoconference in a mixed diagnostic sample. The discussion will begin by addressing the findings pertaining to each research question proposed in chapter three Section 3.4. This will then be followed by a discussion of the strengths and limitations of study one. The overall implications for clinical practice and the field of telemental health will be discussed in chapter six.

4.3.1 Findings Pertaining To Research Question One: Clinical Outcomes

Research question one was; Does CBT administered via videoconference result in different clinical outcomes than when administered in-person? Overall, the findings indicate that CBT treatment via videoconference does not result in poorer clinical outcomes than when administered in-person.

Hypotheses 1, 6, 11 and 16 were supported. The results indicate that overall CBT was effective in significantly reducing symptoms of depression, anxiety and stress and increasing quality of life across time and this effect was large. This finding is consistent with prior CBT meta-analysis research pertaining to depression, (Driessen et al., 2010), specific anxiety conditions (Butler et al., 1991; Ost & Breitholtz, 2000; Rosa-Alcazar et al., 2008) and CBT interventions in general (Butler et al., 2006).

Hypothesis 2, 7, 12 and 17 were not supported. Condition (in-person or videoconference) was not a significant predictor of the severity of clinical symptoms (depression, anxiety, stress and quality of life) across time. This finding is congruent with prior videoconferencing research, such as that pertaining to eating disorders (Mitchell et al., 2008; Simpson, 2006), OCD (Himle et al., 2006), Panic Disorder (Bouchard et al., 2004) and childhood depression (Nelson et al., 2003). Although the difference between conditions on the depression and stress subscales was not significant, a medium effect was observed in favour of the videoconferencing condition. Thus, it is possible that with a larger sample the results may have indicated that treatment outcomes were better via videoconference.

The pairwise comparisons from pre-treatment to follow-up for each condition revealed a similar finding. Hypotheses 1e, 6e, 11e and 16e were supported. The reduction in symptoms from pre-treatment to follow-up in the in-person condition was significant and a medium effect was observed throughout. Hypotheses 1f, 6f, 11f and 16f were also supported. The reduction in symptoms from pre-treatment to follow-up in the videoconferencing condition was significant but in contrast to the in-person condition a large effect size was observed throughout.

The pairwise comparisons also revealed some consistent differences between conditions. Hypotheses 1a, 6a, 11a and 16a were not supported. The reduction in symptoms from pre to post-treatment in the in-person condition was not significant. However, a medium effect size was observed in the depression and anxiety subscales and a small effect in the stress subscale and QLES-Q, all of which were in the

direction of improvement. This suggests that with a larger sample these differences may have been significant. In contrast, Hypotheses 1b, 6b, 11b and 16b were supported. The reduction in symptoms from pre to post-treatment in the videoconferencing condition was significant. For the depression and stress subscales the effect was large and for the anxiety subscale and QLES-Q the effect was medium. Overall the findings from pre to post-treatment indicate that clinical symptoms were reduced, which was to be expected given prior research (Butler et al., 2006).

A further consistent finding throughout the pairwise comparisons pertained to the changes in symptoms from post-treatment to follow-up. The gains made regarding participant symptoms from pre-treatment to post-treatment in both conditions were maintained at follow-up. In neither condition did the results indicate that participant symptoms returned once treatment had ended. Surprisingly, symptoms of depression, stress and quality of life continued to significantly reduce (increase for QLES-Q) after treatment in the videoconferencing condition, but only symptoms of stress continued to significantly reduce after treatment in the in person condition. Although non-significant, a medium effect was also observed in the in-person condition from post-treatment to follow-up regarding symptoms of stress and quality of life. Together, these results indicate that gains in participant symptoms from pre to post-treatment were maintained and many of the participants continued to improve after treatment had ended.

The differences in participant ratings of depression, anxiety, stress and quality of life across time between the in-person and videoconferencing condition were also addressed in relation to reliable change and clinical significance. Overall the differences in the proportion of participants meeting the respective criteria in either condition were negligible. The percentage of participants that met the criteria for reliable and clinically significant change was congruent with prior research (Franklin et al., 2000; McEvoy & Nathan, 2007; Newman, Castonguay, Borkovec, Fisher, & Nordberg, 2008; Stuart et al., 2000). There was however one notable exception. In relation to symptoms of stress the percentage of participants identified as improved (reliable change) in the videoconferencing condition from pre to post-treatment was almost 50% greater than in the in-person condition, and from pre-treatment to follow-up the difference was almost 60% greater. The Fisher's exact test indicated that these differences were significant. It could be that treatment via videoconference is less stressful for the participant and therefore symptoms of stress are more likely to

reduce. Given that the overall MLM analysis for stress was not significant between conditions, the sample is small and the pilot nature of the study, these differences do not provide evidence of the superiority of videoconference.

Although study one was not originally designed to be a non-inferiority trial and the analysis was vastly underpowered, the results provide preliminary support for Hypotheses 5, 10, 15 and 20, that CBT treatment administered via videoconference is not inferior to treatment provided in-person. The 95% lower-limit of the confidence interval in the videoconferencing condition was below the 95% lower-limit confidence interval in the in-person condition throughout. This suggests that the true population mean at post-treatment and at follow-up could be below that of the in-person condition. But again, these findings only provide preliminary evidence and further research using a larger sample is needed before non-inferiority and/or superiority can formally be tested. Yet these preliminary findings are congruent with prior videoconferencing non-inferiority based research (Frueh et al., 2007; Morland et al., 2010).

A final overall pattern in the data for study one was that for all of the MLM analyses, pairwise comparisons and preliminary investigations of non-inferiority, symptom reduction in the videoconferencing condition was slightly greater than in the in-person condition. It is important to note that these differences were not significant, but it was however a consistent pattern throughout the study and the effect sizes ranged from small to medium in favour of the videoconferencing condition. Therefore if this study had more power to detect an effect it is unlikely that clinical outcomes in the in-person condition would have been superior to those obtained via videoconference. There are four possible explanations for this pattern. The first is that treatment via videoconference results in slightly better outcomes than treatment provided in-person. A second possibility is that there was a therapist effect that altered outcomes across conditions. A study with multiple therapists would be required to rule this out. The third explanation is that the small difference reflects allegiance effects towards videoconferencing that were unbeknownst to the therapist. The fourth and final explanation is that this pattern is a random occurrence specific to the sample used in this study. In order to address these potential explanations further research is required with larger sample sizes and multiple therapists.

4.3.1.1 Integrative Summary of Findings Pertaining To Research Question One

The findings of this study indicate that the CBT intervention was effective in significantly reducing symptoms of depression, anxiety and stress, and significantly increasing quality of life across time in both the in-person and videoconferencing condition. These findings are consistent with both prior CBT (Butler et al., 2006) and videoconferencing research (Bouchard et al., 2004; Himle et al., 2006; Mitchell et al., 2008; Morland et al., 2010; Nelson et al., 2003; Simpson, 2006). Despite some minor differences between conditions, the overall findings do not suggest that CBT via videoconference results in poorer clinical outcomes than CBT administered in-person.

4.3.2 Findings Pertaining To Research Questions 2-3: Working Alliance

Research questions two and three asked whether there were statistically significant differences between the quality of the therapeutic alliance reported by participants (and therapists) receiving treatment via videoconference and those receiving in-person services. The results indicated that Hypotheses 23 was not supported; participant ratings of the working alliance in the in-person condition were not significantly poorer than in the videoconferencing condition. The average rating in both conditions was above 87%. These findings suggest that CBT treatment via videoconference does not compromise participants' perceptions of the working alliance. This finding is congruent with prior videoconference research findings (Himle et al., 2006; Simpson et al., 2005). The results also indicated that Hypotheses 24 was not supported; the therapist ratings of the working alliance in the in-person condition were not significantly poorer than in the videoconferencing condition. The average rating in both conditions was above 82%. These findings suggest that CBT treatment via videoconference does not compromise the working alliance.

4.3.3 Findings Pertaining To Research Questions 4-5: Client Satisfaction

Research question four asked whether there are any differences between participant ratings of satisfaction when receiving CBT treatment via videoconference than in-person. Satisfaction was measured at post-treatment and the results indicated that Hypothesis 25 was not supported. Participant ratings of satisfaction in the in-person condition were not significantly poorer than in the videoconferencing condition. The average rating in both conditions was above 93%. These findings suggest that CBT treatment via videoconference does not compromise participant

satisfaction. This finding is congruent with prior research (Kopel et al., 2001; Ruskin et al., 2004; Sorvaniemi et al., 2005).

Research question five asked whether participants who receive treatment via videoconference were satisfied with the technology used to facilitate the intervention. The results indicate that Hypotheses 26 was supported. The average participant rating of satisfaction with the videoconferencing technology was 90%, which was above the operationalized cut-off of 80%. Furthermore, only four participants scored less than 90%. These finding indicates that the majority of participants were satisfied with the videoconferencing technology. Again, this was congruent with prior research (Sorvaniemi et al., 2005).

4.3.4 Findings Pertaining To Research Questions Six: Credibility of Therapy

Research question six was: Is there a difference between participant perceptions of treatment credibility when the intervention is provided via videoconference compared to in-person? This is, to the author's knowledge, the first study to investigate participant perceptions of treatment credibility via videoconference. The results indicated that Hypothesis 27 was not supported. Participant ratings of their perceptions of the credibility of therapy in the in-person condition were not significantly poorer than in the videoconferencing condition. The average rating in both conditions was above 85%. These findings suggest that the CBT treatment via videoconference does not compromise the participants' perceptions of treatment credibility. This finding is congruent with prior research on treatment credibility (Borkvec & Nau, 1972; Devilly & Borkovec, 2000).

4.3.4.1 Integrative Summary of Findings Pertaining To Research Questions 2-6

The findings of study one indicated that the hypotheses regarding the working alliance, satisfaction and the credibility of therapy were not supported and the effect sizes range from small to very small. Together these results suggest that treatment via videoconference does not compromise the working alliance, satisfaction or participant perceptions of treatment credibility. These findings are also congruent with prior research (Bouchard et al., 2004; Himle et al., 2006; Ruskin et al., 2004; Simpson et al., 2005).

4.3.5 Strengths

To the author's knowledge this study is the largest videoconference-based CBT RCT project conducted on an adult population in Australia. Study one is also the first study pertaining to treatment via videoconference that specifically compared changes in symptoms of stress and differences in participant perceptions of treatment credibility between in-person and videoconference-based treatment. Furthermore, this study is the first to report the treatment of GAD and health anxiety via videoconference.

First, the inclusion of a mixed diagnostic sample is a strength of this study. A participant group with a range of disorders and comorbidities helps in generalizing the findings to real-world clinical practice populations and thus provides empirical support for the effectiveness of videoconferencing for mental health conditions. Individualised treatment is also a strength of the study because it is common in real-world practice for clinicians to modify treatment interventions to suit the client's needs (Persons & Silberschatz, 1998). Hence, the findings of the study have greater relevance for real-world clinical settings.

Second, the same therapist treated all participants, and thus this variable was held constant. It is generally agreed upon in the psychotherapy literature that therapists vary in their effectiveness irrespective of clinical orientation (Wampold, 2001). By including only one therapist in the study the difference between conditions cannot be attributed to differences between therapists.

Third, the use of participants from metropolitan populations means the differences between treatment conditions reflected differences in the technology rather than differences between the rural and metropolitan participant groups. The majority of in-person empirically based research has been conducted on metropolitan populations (Franklin et al., 2000; McEvoy & Nathan, 2007; Mitte, 2005a; 2005b; Persons, Bostrom, & Bertagnollie, 1999). Therefore metropolitan populations represent a better comparison group for comparing new forms of clinical practice in the initial stages of research. Also, if rural participants had been included in the study, their ratings of satisfaction might be high because they do not have to travel far to attend their appointment. By using metropolitan populations in both conditions a more accurate reflection of participant satisfaction can be obtained because there was no specific benefit for participants via videoconference. Consequently, ratings of

client satisfaction in this study are uncontaminated by the potential benefits of videoconferencing for rural and remote populations.

A final strength of this study is that it was conducted on a high-speed local network. Technology advances at a rapid pace, consequently today's latest technology will soon be out-dated along with the conclusions made on such systems. However, this research was conducted on high-speed local network systems, which although at present results in a faster speed of transmission than via the Internet, as the infrastructure improves so too will the speed of Internet communication. As a result of conducting the study on a system that is presently faster than the average Australian Internet speed, it may be a longer period of time before the conclusions of this study become out-dated.

4.3.6 Limitations

Although study one has successfully extended previous research (Bouchard et al., 2004; Himle et al., 2006; Mitchell et al., 2008), there are several limitations that need to be considered. Each of these limitations will be addressed in turn below. One of the limitations of this study was that the same therapist, who was also the researcher, conducted all of the therapy sessions. Consequently, it remains unclear if the findings in this study generalise to other practicing therapists (Mitchell et al., 2008; Nathan et al., 2000). Furthermore, the therapist began the study believing that videoconference-based psychotherapy would probably result in similar outcomes as in-person interventions. As a result, potential allegiance and bias effects could have been present (Nathan et al., 2000). Although the difference between conditions was not significant, allegiance effects may explain why the outcomes in the videoconferencing condition were consistently slightly higher across all of the symptom measures for all of the analyses. One way of addressing the limitation of using only one therapist is via replication. Another study has also employed a design that involved just one therapist (Nelson et al., 2003) and similar outcomes were observed. Accumulatively such studies lend empirical support to one another. However, when feasible it is preferable to conduct studies with multiple therapists and control for the variation statistically so that generalizability is enhanced (Persons & Silberschatz, 1998). An example of such a study is provided by Mitchell et al. (2008), which involved six doctoral students and a larger sample size. But similar to the findings of this study, Mitchell et al. (2008) did not observe any significant

differences between conditions with regards to changes in symptom across time. It is also relevant to note that no matter how many therapists there are in a psychotherapy-based RCT it is impossible for the therapists to be blind to the treatment condition (Persons & Silberschatz, 1998). Consequently, allegiance effects are somewhat unavoidable.

Another limitation of this study is the sample used. The sample was small for a RCT and involved a wide range of disorders. Consequently, an analysis of clinical outcomes between in-person and videoconference-based treatment for specific disorders could not be conducted. Therefore it remains unclear if specific disorders are more or less effectively treated via videoconference than in-person based treatments. A mixed diagnosis client cohort may have also obscured treatment effects for specific conditions. Also complicating this issue is that there were more participants with a primary diagnosis of OCD in the videoconferencing condition (8) than in the in-person condition (4), and more participants with depression as a primary diagnosis in the in-person condition (5) than in the videoconferencing condition (1). Thus, it could be argued that the two participant groups were not equivalent at pre-treatment. These differences may have obscured treatment effects and/or exaggerated the average outcomes of each condition. However, the analysis did not involve comparing the reduction in symptoms for clients with one disorder in the videoconferencing condition to the reduction in symptoms for clients with that same disorder in the in-person condition. General client symptomology, such as stress, was averaged across all the participants in a condition and compared to the averaged scores across the alternative condition. Consequently this variation in client diagnosis is both a strength and a limitation of this study and has been discussed in section 3.6.1.4 Furthermore, the change scores pertaining to specific disorders were analysed in addition to the main analysis, which are not contaminated by differences between participants at pre-treatment (Jacobson & Truax, 1991) which overcomes some of the limitations in the main analysis. Given that the analysis of change scores obtained similar results as the main analysis, together these converging lines of evidence support the assertion that there is little difference in treatment outcomes obtained via videoconference compared to in-person.

A further issue pertaining to the sample is regarding the inclusion/exclusion criteria. Although the criteria included a wide spectrum of mood and anxiety related disorders, participants with a primary diagnosis of a personality disorder or any

psychotic-related conditions were excluded from the study. Consequently, the study is unable to draw any conclusions about the effectiveness of videoconferencing for these populations. However, many of the participants in this study presented with comorbid Axis-II diagnoses (see Table 7), therefore the findings suggest that comorbid personality disorders might not negatively impact videoconference-based treatment outcomes.

The participants in this study were not blind to the experimental manipulation, which could influence clinical outcomes (Nathan et al., 2000). It is impossible to prevent participants from knowing that they have been randomised to the videoconferencing condition. It is possible that some participants support the use of videoconferencing technology to provide mental health services to remote and rural Australians. Such attitudes may consciously or unconsciously affect clinical issues, such as their willingness to engage in therapy via videoconference and/or their selection of items on questionnaires. But this is a common problem throughout most telemental health research.

Although the participants seen via videoconference were remotely situated from the therapist's location, they could see from the digital image that the therapist was in the same building. This may have provided some comfort to the participants. Cowain (2001) treated a participant with panic disorder via videoconference who commented that they were concerned about having difficulty engaging in exposure exercises via videoconference because the therapist was 300km away and would not be able to intervene if something went wrong in the session. If an emergency occurred during the course of this study it was possible for the therapist reach the participant's location in a matter of minutes, and the participants were aware of this. It is not possible with the methodological design of study one to determine if exposure exercises are more or less effective when the participant is physically situated at greater distances from the therapist. However, this could be addressed in future research.

Another issue regarding the treatments used pertains to the participant perceptions of treatment credibility. In this study the participants' perceptions of treatment credibility was assessed by administering a modified version of the original CTQ (see Section 4.1.5.2.6). The reason for this is that when designing the study the author was not aware of more recent and applicable forms of the CTQ (Devilly & Borkovec, 2000). As a result, it is unclear as to how well the version of the CTQ used

captures participants' perceptions of treatment credibility. Nevertheless, the findings of the modified CTQ suggest that the participants perceived the treatment as credible in the in-person condition as in the videoconferencing condition.

Issues are also present in this study that pertain to the diagnosis of participants, which were conducted in-person by the therapist who also conducted the subsequent treatment. It is possible that rapport and a therapeutic alliance began in this initial in-person diagnosis session. If this is the case then it might provide an alternative explanation as to why there were no significant differences between participant and therapist rating of the working alliance. It is possible that in the diagnosis session both participant and therapist formed an initial impression of one another that became the basis of their perceptions of the therapeutic alliance at the end of treatment. However, given that the therapeutic alliance measures were obtained three months after the initial diagnosis session and a therapeutic alliance typically matures several sessions into therapy (Teyber, 2006), it is unlikely that the in-person diagnosis sessions biased the videoconference-based data but it is a limitation of the study that is worth considering. Secondly, although supervision was used to confer the diagnosis, no additional independent assessments of diagnoses were made. Consequently there is no measure of the inter-rater reliability of the clinical diagnosis that can be used to assert the accuracy of diagnosis. If participants were incorrectly diagnosed then it is likely that they received a treatment that may not have been particularly relevant to their condition. However, given that the majority of participants improved during the course of treatment, and clinical supervision was frequently provided throughout, it is unlikely participants were inaccurately diagnosed.

A limitation of this study was the sample size. The overall question of study one is 'does treatment via videoconference result in poorer clinical outcomes than when administered in-person'. Therefore small differences in clinical outcomes between the two treatment modalities would be of practical relevance. However, the sample size was not large enough to have sufficient power to detect a small effect. This issue was of particular importance to the preliminary non-inferiority analysis, as the sample was not of sufficient size to justify a formal hypothesis test of non-inferiority between the two treatment modalities. However, meaningful information can be gathered from the effect sizes between treatment conditions. With regards to participant ratings of quality of life the magnitude of the difference between

conditions was very small, which suggests that even if the size of the sample had been increased it is unlikely that the difference would have been significant. However, for the three DASS subscales the effect size was medium, small and medium in favour of the videoconferencing condition. These effect sizes suggest that if the sample size was larger than significant differences between conditions in favour of the videoconferencing condition may have been observed. However, as Hsu (1989) noted, there is almost a 40% chance that a sample size of 24 participants randomised between conditions will systematically vary on two unmeasured nuisance variables at pre-treatment, whereas if the sample consisted of 60 participants then there would be less than a 5% chance. In light of this, it is possible that the small to medium effect sizes observed between condition across the DASS could reflect unmeasured pre-treatment differences on nuisance variables as opposed to differences related to the media. In either case, this issue could be addressed in future research

A final limitation pertains to all RCT designs. It has been argued that although research trials such as this are useful for providing empirical evidence that can be used to guide clinical practice, much of the details regarding participant experiences of treatment can become lost at the macro level (Persons & Silberschatz, 1998). Many of the subtleties of the clinical interaction that may provide useful information for the practicing clinician are not examined in such trials. Videoconferencing technology is a relatively new way of interacting with clients and therefore there may be undiscovered and/or unreported new ways of communicating with clients that are unlikely to become evident in a RCT.

4.3.7 Adherence To The Consort Guidelines

The design of study one originally only involved the examination of parallel groups therefore it is the CONSORT guidelines for parallel RCT's (Altman et al., 2001; Moher, Schulz, & Altman, 2001) that was most closely followed. The CONSORT guidelines stipulate what should be reported in the scientific literature for RCT studies. Examples for parallel groups include describing participant eligibility criteria, sample size, methods of randomisation, the process of participant enrolment, the flow of participants through the study and detailing the hypotheses (for the full list see Moher, Schulz, & Altman, 2001). Given that the study was designed with these guidelines in mind the study is congruent with the guidelines, with the exception being a slight change in the order of material presented. For example, information

regarding client recruitment is recommended to be situated in the results section but the decision was made to place the recruitment information in the methods section for better flow of expression. As the study progressed greater consideration was given to the need to include a noninferiority analysis of the data. Therefore the CONSORT guidelines provided by Piaggio et al. (2006) pertaining to a noninferiority RCT were consulted, which differ slightly from the guidelines of parallel groups. For example, the guidelines require that the hypotheses relevant to noninferiority be described, that a separate sample size be calculated for the analysis and that 95% confidence intervals for outcomes pertaining to the noninferiority analysis be reported. Study one demonstrates that it is possible to adhere to both CONSORT guidelines within the same study but the order of reporting may need to be adjusted to suit the needs of the content.

4.4 Chapter Summary

This chapter has presented the first RCT study to investigate the effectiveness of CBT via videoconference for a real world Australian adult participant group. The findings indicated that participants in both the in-person condition and the videoconference condition improved on each of these measures from pre to post treatment and that these gains were maintained at six weeks following treatment. Furthermore, no significant differences were obtained between conditions regarding treatment outcomes, perceptions of the therapeutic alliance, satisfaction and perceptions of treatment credibility. The analysis of the disorder specific measures also indicated that there was little difference between conditions regarding the number of participants that were identified as improved and/or recovered. But RCTs such as this do not provide specific details about the participant's personal experiences with treatment via videoconference. Hence study two, reported in chapter five, was conducted to provide an in-depth analysis of a participant and therapist's clinical experiences via videoconferencing technology and to investigate some of the unique benefits of interacting via digital media.

Chapter 5: Study Two: Case Study Of Combined Videoconferencing And Text-Based Therapy

As was discussed in chapter one, there is a body of evidence attesting to the effectiveness of CBT for a variety of psychological disorders (Barlow, 2008; Sookman, & Leahy, 2010). However, as with all modes of psychotherapy, successful outcomes are largely dependent on client engagement, which can be difficult to foster with clients with severe and complex problems (Fiorentine, Nakashima, & Anglin, 1999). Hence, exploring ways client engagement can be improved may enhance CBT practices (Westra & Arkowitz, 2010). Although videoconference-based treatment outcomes of psychotherapy have been investigated (see chapter two and three), there is a limited amount of research addressing its effects on client engagement. Thus, further research exploring how videoconferencing technology influences client engagement is needed. This chapter will begin by exploring some of the literature relevant to client engagement, followed by a discussion of the clinical literature relevant to the case that is presented. The main focus of this chapter will then turn towards exploring the events that unfolded with a participant who was originally a participant in study one. Like the other participants in study one, this participant took part in the initial screening and received 12 sessions of CBT. However, after these twelve sessions he was given the opportunity to take part in study two and thus he was not included in the follow-up data in study one.

5.1 Background

Client engagement in the therapy process is essential because without it many of the core techniques, such as the development of a formulation and guided empiricism, cannot be done. While there is no universal definition of client engagement (Dearing, Barrick, Dermen, & Walitzer, 2005) there are several factors that indicate the presence of client engagement. For example, if a client attends sessions on time (Fiorentine, 2001), has appropriate expectations for what can be achieved in therapy (Weinberger & Eig, 1999), finds the treatment process satisfying (Ries, Jaffe, Comtois, & Kitchell, 1999), and experiences a positive therapeutic relationship and alliance (Horvath & Luborsky, 1993), then client engagement is

likely to be present. Under most circumstances a therapist cannot force a client to attend therapy, to accept and harbour reasonable expectations regarding therapy, or to find the treatment experience satisfying. However, a therapist does have a direct influence on the quality of the therapeutic relationship and the therapeutic alliance.

As noted in chapter one, the therapeutic alliance is characterised by factors such as warmth, genuineness and positive regard (Cormier & Nurius, 2003) and can be defined as “the degree to which the therapy dyad is engaged in collaborative, purposive work” (Hatcher & Barends, 2006, p. 293). The therapeutic alliance has direct relevance to the concept of client engagement because if collaborative purposive work is occurring then, by logical extension, the client must also be engaged in therapy. Yet, the degree to which the content of therapy is purposive is interdependent on a client’s willingness to honestly and openly disclose relevant content. Disclosure is the act of revealing private information (Stiles & Shapiro, 1994) and must be undertaken by the client if they intend to have their issues addressed by the therapist.

In the process of therapy, some issues are more likely to be disclosed than others. Some issues clients discuss are of minimal importance but likely to be disclosed (high positive discrepancy), such as feelings of aggression, revenge and self-loathing and issues pertaining to disappointments and frustrations regarding themselves and significant others (Farber & Hall, 2002; Farber, 2003). Other issues extremely important to clients unlikely to be disclosed include the nature of their sexual experiences, sexual abuse, sexual fantasies towards the therapist, pornography, bathroom habits and feelings of inadequacy (high negative discrepancy) (Farber, 2003). Thus, it is not the breadth or depth of self-disclosure that influences clinical outcomes, it is the degree to which important issues are being discussed in a manner commensurate with their salience (Farber, 2003). Failure to disclose such topics is caused by conscious inhibition as a result of shame and/or fear (Kelley, 1998). If a client is disclosing and collaboratively discussing issues that they believe are both important and shameful then it can be assumed that the client is experiencing purposive engagement in therapy, which in turn is likely to lead to better client outcomes (Farber & Hall, 2002; Farber, 2003). For some clients the interpersonal anxiety, stemming from predictions of punitive and/or judgmental therapist reactions, prevents them from engaging in therapy in an honest and open manner (Teyber, 2006).

Clients that present with extremely severe and/or complex problems, such as schizophrenia and borderline personality disorder, have been found to have difficulty engaging in therapy (Keijser, Hoogduin, & Schapp, 1994). Another challenging condition to treat is obsessive-compulsive disorder, which occurs in approximately 3% of the population (Rees, 2009) and is the tenth leading cause of disability (WHO, 1999). In a 40-year follow-up of clients who were treated for OCD, Skoog and Skoog (1999) reported that although most sufferers improve after treatment, the majority continue to have clinical or subclinical symptoms.

Although there are effective CBT treatments for OCD (Rees, 2009; Rosa-Alcazar et al., 2008), even for treatment resistant cases (Sookman & Leahy, 2010), the literature indicates that there are certain diagnostic profiles that can further add to the challenge of client engagement. For example, Schizoid Personality Disorder as a comorbid diagnosis is associated with poorer treatment outcomes (Fricke et al., 2006; Jenike, Baer, Minichiello, Schwartz, & Carey, 1986), greater rates of suicide and suicidal ideation (Alonso et al., 2010), poorer insight, more negative symptoms and lower functioning (Poyurovsky et al., 2008). Furthermore, clients with the additional DSM-IV (2000) OCD specifier of 'poor insight' have been found to have a poorer long-term prognosis (Captapano et al., 2010). Comorbid social and interpersonal problems inherent in Social Anxiety Disorder and Avoidant Personality Disorder have also been observed to hinder a client's ability to engage in treatment (Buckner & Schmidt, 2009). Similarly, a comorbid diagnosis of Obsessive-Compulsive Personality Disorder has been shown to complicate the treatment of OCD (Mancebo, Eisen, Grant, & Rasmussen, 2005). Clients with these disorders have difficulty presenting for treatment, revealing the details of their anxiety, staying in treatment, and completing exposure tasks outside of therapy (McNamee, O'Sullivan, Lelliott, & Marks, 1989).

Another factor that can be an issue in the treatment of OCD is the nature of the thoughts themselves. Obsessive ego-dystonic thoughts are a typical feature of OCD and are characterised by intrusive thoughts pertaining to violence, inappropriate sexual acts and/or blasphemous content (Salkovskis & Harrison, 1984). The rituals used to control or avoid the intrusive thoughts tend to be idiosyncratic (Rees, 2009). Hence, most clients with OCD experience many negative emotions, such as shame, guilt and embarrassment, regarding the details of their condition (Swinson, Antony, Rachman, & Richer, 1998). As a result, clients can be understandably anxious about

revealing and discussing their obsessions and compulsions with the therapist due to fears of being judged negatively and/or having the therapist confirm their fears that they are bad/dangerous (Rees, 2009). Discussing the details of such problems forms an integral first step of providing empirically validated treatment for OCD. Consequently, methods of engaging the client are needed in order to help them open up about such matters.

Unfortunately though, much of the treatment literature has focused on improving the content of therapy (Sookman & Leahy, 2010) rather than focusing on how the therapy is implemented. Consequently there is a dearth of specific process techniques (as opposed to general non-specific techniques such as empathy and genuineness) that can be used to help clients overcome their reluctance to openly and honestly engage in therapy (Buckner & Schmidt, 2009). When a client is extremely interpersonally anxious it becomes more likely that they will have trouble expressing their presenting difficulties, confiding in the therapist openly and developing sufficient trust and rapport (Teyber, 2006). Keeping such clients in treatment is can be a challenge. Providing a flexible range of media through which the client can interact, such as telephone, text-chat and video, may enhance a client's capacity to remain engaged in the treatment despite their anxiety (Day & Schneider, 2002).

As was discussed in chapter two (Section 2.3), telemental health services can be conducted via a variety of different formats, such as video, audio and synchronous text-based chat. A substantial amount of literature exists suggesting that psychotherapy via videoconference can be as effective as in-person (Richardson, 2009; Simpson, 2009). The research literature also indicates that it is possible to conduct psychotherapy via text-based real-time chat (Hopps, Pepin, & Boisvert, 2003; Mallen et al., 2005; Murphy & Mitchell, 1998; Pollock, 2006). Several lines of anecdotal evidence indicate that some clients may find videoconferencing and text-chat to be less interpersonally anxiety provoking and thus the technology may help them to engage more in therapy (Bakke et al., 2001; Himle et al., 2006; Simpson et al., 2005). For example, after reviewing the outcomes of videoconference-based treatment for several clients with bulimia, Simpson et al. (2006) asserted that "the distance and space provided by video therapy may have helped these clients to engage in treatment to a greater extent than would have been possible face-to-face" (p.237). These findings suggest that one potential way of improving client engagement for

clients with complex and severe issues may be to utilise malleable modalities of treatment delivery.

Although there has been some reported examples where videoconferencing technology appeared to be therapeutically beneficial above and beyond what could be achieved in-person, the exact conditions under which this occurs currently remain elusive (Richardson et al., 2009). Hence, further research is needed to identify the conditions under which treatment via videoconferencing technology may enhance client engagement for clients with complex and severe issues. Below is a case study of a participant treated via combined videoconference and text-chat that presented with severe and complex issues. A thematic analysis of the session recordings and the therapist's notes was conducted with the aim of exploring how the technology influenced the participant's engagement in therapy, and to determine if the technology enabled any specific therapeutic techniques that could not have been delivered in a traditional in-person therapeutic setting. Furthermore, the following case study is, to the author's knowledge, the first reported case of combined videoconferencing and text-chat technology being used in a clinical interaction.

5.2 Methods

5.2.1 Design

An exploratory single case-study design was used with a qualitative thematic analysis.

5.2.2 Participant

The participant (John) was a 22-year old male who was referred by his psychiatrist for treatment of OCD. His presenting complaints were excessive hand washing, use of mouthwash and repeated checking. John's OCD began age 12 and had become steadily worse. John was prescribed 40mg Fluoxetine for his OCD in his late teens and continued taking it throughout the majority of treatment. The participant did not report any prior psychological treatment. The Minnesota Multiphasic Inventory-2 (Hathway & McKinley, 1989) was administered and supported the clinical observations regarding John's personality: unhappy, pessimistic, immature, impulsive, preoccupied with guilt, unworthiness and inadequacy, poor judgment, disorganised thinking, impaired contact with reality, frequently irritable, confused, introverted and emotionally over controlled. John met

the full criteria for OCD and Schizotypal, Obsessive-Compulsive and Avoidant personality disorders.

5.2.3 Rationale For The Selection Of Participant

John was originally a participant in study one (see chapter four) but was invited to take part in additional psychotherapy and further clinical investigation. It is important to note that this participant was not chosen for additional analysis because he provided an ideal example of psychotherapy via videoconference or text-chat. Nor was this participant chosen for further study because he provided an exemplary example of how CBT should be conducted with a participant presenting with a complex array of OCD, personality and interpersonal difficulties. The primary reason John was chosen for additional clinical and scientific exploration as a case study was because the severity of his clinical presentation forced the clinician to find creative ways of using the digital technology to increase participant engagement and facilitate honest and meaningful disclosure. In the descriptions and analysis of the case study provided below the ways the digital media appeared to influence participant engagement and the practice of psychotherapy is explored.

5.2.4 History

John asserted that when he was 12 he developed compulsive urges to masturbate, which caused him considerable distress. John reported that he would masturbate 10-15 times a day, despite the discomfort and desire not to engage in such activity. When he was 14 he realised he was homosexual. It was around this time he began having intrusive thoughts of raping his dead cousin and due to his religious convictions John believed his intrusive thoughts were hurting her in the afterlife. The ensuing guilt reinforced his beliefs that his thoughts were 'bad' and should be avoided. However, the thoughts increased in frequency as a result of his attempts to suppress them. Eventually John began to fear that he might be a paedophile. By the time John was 18 he had a variety of distressing intrusive thoughts and rituals that caused him considerable interpersonal distress. It is also important to note that all of the details of the history provided above were not known at the time of assessment. These details emerged slowly over the course of psychotherapy.

5.2.5 Formulation

John had extreme difficulty tolerating uncertainty, over-emphasised the importance of his thoughts, engaged in obsessional doubting and had an inflated sense of responsibility, such as believing that if he didn't unplug an appliance from a wall socket properly then it might lead to someone being electrocuted. John evidenced a great deal of mind reading; for example, when walking he was fearful that others could detect if he had masturbated. John also exhibited a considerable amount of magical thinking; for example, John stated that he was afraid that if he verbalised his troublesome thoughts that they would eventuate in reality. Behaviourally, John's problematic thoughts were maintained by his avoidance of triggers, such as children's playgrounds and shopping centres, as well as engaging in neutralizing behaviours (a variety of repetitive acts). Throughout the course of treatment it became evident that John had a deficit in social skills and had a strong aversion to making eye contact.

5.2.6 Materials

The equipment used was the same as that used in study one.

5.2.7 Clinical Procedure

John was seen by a provisionally registered (trainee) clinical psychology doctoral student (author) who had been trained in CBT for the treatment of OCD. The therapist received weekly supervision from an experienced registered clinical psychologist. Initial assessment was conducted in-person using the SCID (First et al., 1996; First et al., 1997). The treatment provided was based on the CBT framework outlined by Rees (2009). All treatment sessions were conducted via the videoconferencing technology. In the beginning treatment was limited to 12-weeks, however, given the severity and complexity of the presenting problems and the novel use of the technology in session nine, treatment was extended for a further 28 sessions. The initial goals for treatment were to help John reduce his repetitive hand washing behaviour by providing psychoeducation, exposure-response prevention and cognitive restructuring. However, John's avoidant interpersonal style and complex presentation made it very difficult to implement these techniques. Furthermore, as disclosure increased the goals expanded from addressing the hand washing to a variety of different yet related OCD and interpersonal problems.

Table 27

Stages Of Treatment and Corresponding Media

| Stage | Session | Talking Via Video | Mainlya Talking Via Video | Mix Of Media | Mainlya Text |
|-------|---------|-------------------|---------------------------|--------------|--------------|
| 1 | 1 | X | | | |
| | 2 | X | | | |
| | 3 | X | | | |
| | 4 | X | | | |
| | 5 | X | | | |
| | 6 | X | | | |
| | 7 | X | | | |
| | 8 | X | | | |
| 2 | 9 | | | X | |
| | 10 | | | | X |
| | 11 | | | X | |
| | 12 | | | X | |
| | 13 | | | X | |
| | 14 | | | X | |
| | 15 | | | X | |
| | 16 | X | | | |
| | 17 | | | X | |
| 3 | 18 | | | | X |
| | 19 | | | | X |
| | 20 | | | | X |
| | 21 | | | X | |
| | 22 | | | | X |
| | 23 | | | | X |
| | 24 | | | X | |
| | 25 | | | | X |
| | 26 | | | | X |
| | 27 | | | | X |
| 4 | 28 | X | | | |
| | 29 | | | X | |
| | 30 | | | | X |
| | 31 | | | X | |
| | 32 | X | | | |
| | 33 | | | X | |
| | 34 | | X | | |
| | 35 | | | X | |
| | 36 | | X | | |
| | 37 | | | X | |
| | 38 | X | | | |
| | 39 | | | X | |
| | 40 | X | | | |

aMainly is defined as approximately more than 90% but not the entire session

5.2.8 Analysis Procedure

The procedures outlined by Braun and Clark (2006) regarding the use of thematic analysis in psychology was used to guide the analysis. The focus of the analysis was based on the question: how did the videoconferencing technology influence participant engagement? Although the role of therapist and clinical content factors were noted in the analysis, the role of the technology in the clinical interaction was the primary focus. Phase one of the analysis was familiarization with the data,

which involved re-watching all of the recorded sessions, making notes and transcribing content relevant to the research question. During this process Table 27 was created to make a log of media used within each session. Upon visual inspection it became evident that the use of the different media corresponded to different stages of therapy. Consequently, phase two began by using these stages to form the initial structure for coding.

Session recordings, notes, transcriptions, thought diaries and text-chat dialogue were imported into NVivo (version 9). Once imported, the data was reviewed and each utterance or line of dialogue, therapeutic technique and non-verbal behaviour relevant to the research question was coded. Phase three involved organizing the codes into themes relevant to the corresponding stage of treatment. In phase four the candidate themes were reviewed by both the author and an external rater for coherence and distinction between themes. Finally the themes were given a name that reflected their content within the overarching structure of the stages.

5.3 Results

5.3.1 Stage 1: Sessions 1-8 (Rapport Building)

The first eight sessions were conducted via videoconference. Although typical clinical techniques were employed during this stage of treatment (e.g., psychoeducation, symptom monitoring and exposure response prevention), their effectiveness was compromised by John's lack of authentic engagement in therapy. For example, John initially reported that he was concerned about germs therefore he engaged in excessive hand washing, hence the initial therapy sessions were aimed at confronting his fear of germs. However, it was not until the later stages of therapy that authentic engagement had developed and John revealed more pressing concerns that motivated his hand washing.

5.3.1.1 Theme: Overcoming Resistance to Disclosure

As to be expected in the rapport building stage of therapy, there were several instances John was resistant to divulging the details of his bothersome thoughts. This resistance was typically expressed by John through the use of silence, changing the topic, inquiring as to why the thoughts needed to be divulged or refusing to say more yet acknowledging that there was more to say. For example, when asked why he felt 'uncomfortable' pulling a plug out of a wall socket he said "*sometimes I worry that*

the metal plugs might get dusty and dirty... but I don't think that was the reason that time". The first successful instance of overcoming John's resistance occurred in the third session when he agreed to use pen and paper to elaborate on his intrusive thoughts, upon which he wrote "*most of the things listed on the sheet*", which referred to a psychoeducational list of typical distressing thoughts. Although new disclosures did occur verbally, they were primarily pertaining to his feelings and issues with family.

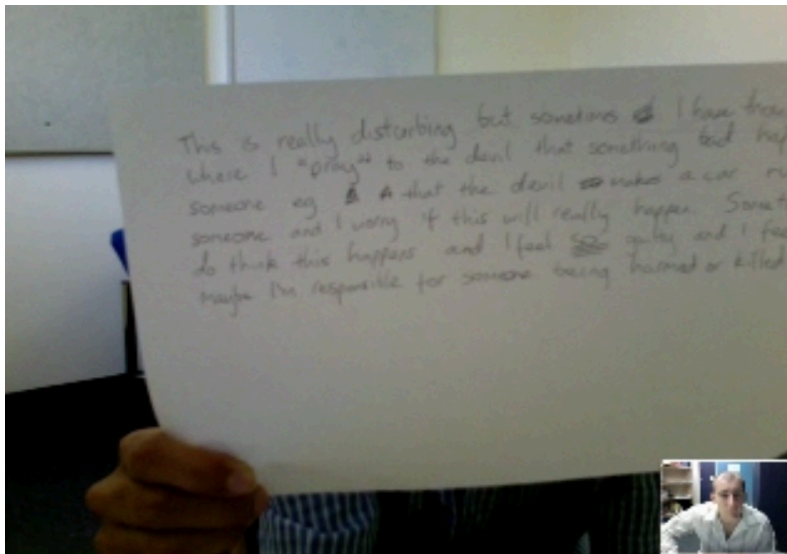


Figure 7: An example of communicating on pen and paper via videoconference

The most revealing disclosures were always expressed on paper (see Figure 7) before being discussed verbally and each paper-based disclosure was more revealing and/or confrontational than the last. Over the course of sessions 3-7 John disclosed via paper thoughts involving praying to the devil for bad things to happen, thoughts of stabbing people and fears of being a psychopath. He also alluded to other distressing thoughts that he was not yet able to reveal. Paper-based disclosures increased in importance and in session eight when he wrote something down that he did not want the therapist to read in his presence but agreed to leave it in the room so that the therapist could read it in his absence. It was in this disclosure John stated that at "*times these thoughts aren't so (involuntary)*".

5.3.1.2 Theme: Acceptance of Alternative Media

John was initially resistant to the use of alternative methods of communication. For example, regarding communication via videoconference John stated: *“to be honest, um... I probably... I didn't really want to...I was like, at the beginning, I...I didn't want to do this (points to the camera), I wanted to do it face-to-face”*. However, despite the resistance to videoconferencing John went on to state a preference for it: *“since I am a really shy person um I actually felt a bit more comfortable speaking to you via the screen”*. By session three it was evident that John was having considerable difficulty expressing himself verbally, therefore the therapist asked him if he could attempt writing on paper and putting it up to the camera. John again refused stating: *“I guess it's just that um I'm too, I'm probably too ashamed to say or write it down”*. After the therapist self-disclosed one of his own recent unpleasant thoughts John began writing for the first time. John's acceptance of paper-based communication is evident in not only his repeated use in subsequent sessions but also his unprompted request to use it in sessions five and seven. Unfortunately though, despite the improvements in disclosure as a result of paper-based interaction, communicating via this media was time consuming and it was cumbersome to see what was written. Resistance was also evident regarding text-chat: *“I think, maybe a text chat would be okay for some things but I'd feel more comfortable writing things on a piece of paper and if you were reading it, I don't know, it just feels more private”*.

5.3.2 Stage 2: Sessions 9-17 (Beginning of Meaningful Disclosure)

Session nine was a turning point in the course of John's therapy, not because of what was disclosed, but because the media through which he communicated was expanded to include text-chat. Interacting via text overcame the limitations of viewing written material via videoconference and allowed us to use synchronous (real time) communication but without the loss of audio-visual feedback typically associated with text-chat. Communicating via a combination of text, audio and video simultaneously enable new therapeutic dynamics to emerge. The change in participant engagement after integrating this medium is most aptly reflected in the fact that John was approximately 20-30 minutes late for six out of the first nine sessions but only five out of the following 30 sessions. An example of what the therapist computer

screen displayed during a therapy session of combined videoconferencing and text-chat is displayed in Figure 8.

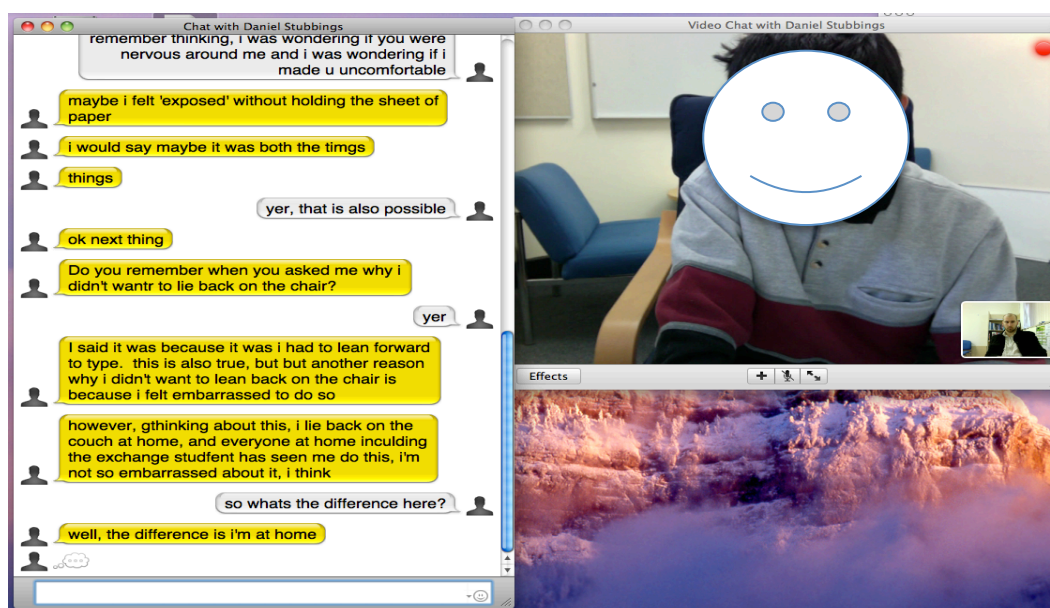


Figure 8: An example of a combined videoconference and text-chat from the point of view of the therapist. On the left is the window containing the written text and on the right is the window containing both the participant and the picture-in-a-picture of the therapist. The picture in the bottom right is of the desktop image and is irrelevant.

5.3.2.1 Theme: Facilitation of Disclosure Through Text-Chat

Throughout stage two there were multiple disclosures via text and video, however content disclosed via video was mostly pertaining to issues low in shame and anxiety, such as difficulties with eye contact, doubting memory, troubles with family, career and religion. Although several of these issues were also discussed via text, issues regarding intrusive thoughts of violence, paedophilia and rape were only discussed via text. Once John began using text-chat he stated “*I think I can say a lot more through messaging (text-chat) than just talking*” and that “*messaging beats writing on paper*”. John began expressing himself more fluidly via text and there was a consistent pattern where every time he had difficulty talking via video he switched to text, which in almost all instances led to further disclosure and/or increased the fluidity of his expression. Furthermore, both John and the therapist were approximately equal in the number of instances they were the instigator for changing

the media from text to video (10/8 respectively), whereas for changing from video to text John instigated the switch far more frequently (14/4 respectively).

5.3.2.2 Theme: *Limits of Media Facilitation*

Although text-chat appeared to increase participant engagement, the media cannot solely account for the improvement and maintenance of participant engagement. As John became more adept at communicating via text-chat, clinical difficulties began arising in a similar manner to what is observed in typical in-person therapy, such as challenging the therapist, discussing irrelevant concerns and testing the therapeutic alliance. For example, at one point John said via text “*you don’t know me, I haven’t told you everything, I haven’t been honest*” and in another session he said via video “*I don’t know if this therapy is really going to do much*”. Hence, despite the overall increase in disclosure, the utility of interacting via combined video/text appeared to be, as in all clinical methods, limited by the degree to which the therapist can skilfully employ the standard client engagement techniques, such as active listening/reading, empathizing, appropriately timed therapist disclosures, and use of process comments. Furthermore, there was a gradual increase in the salience of the material disclosed, which suggests that both time and the ongoing use of standard clinical skills also contributed to the development and maintenance of participant engagement.

5.3.2.3 Theme: *Unique Media Methods*

Communication took place either via video, text or a combination of the two, each of which had unique characteristics and capacities that affected the client-therapist interaction. The use of combined text and video enabled greater interactional flexibility because it made it possible to respond to the other via a different media than the source of the address. Furthermore, it enabled the participant and therapist to see the facial emotions associated with what was being typed or read, thus allowing comments such as “*your smirk tells me...*”. Text-based communication results in a visible transcript of the conversation that cannot be undone and provides vivid proof of what was communicated. The effect of this is aptly reflected in John’s remark after rereading a recent text disclosure: “*oh my god I just said all that stuff*”.

Two unique video techniques were observed that appeared to influence John’s engagement with therapy: moving out of frame and replaying parts of a previous

session. Due to strong feelings of shame and interpersonal anxiety John made little or no eye contact and usually his head was bowed throughout sessions, irrespective of whether he was typing or not. Therefore in session 16 the therapist experimented by moving out of the camera's line of sight (see Figure 9). When John realised that he was looking at an empty room he relaxed and began looking at the screen, following which the therapist reflected how good it felt to be able to see him and his emotions directly. When asked why he felt better when he couldn't see the therapist he said "*I guess it's because I, when I'm talking to you and if I make eye contact, well that's, I think I would be anxious, yeah, so if you're not there then um, I don't feel anxious*". Following this John began discussing for the first time how he perceives the eyes of others turning red when he has intrusive thoughts about them. The therapist then asked John to look at him and let him know if his eyes went red when he has an intrusive thought, which he did. Then, in the 17th session, the moment John perceived the therapist eyes as red was replayed via videoconference (see Figure 10) and John observed himself, realised and commented: "*I wasn't looking [at the screen]*".

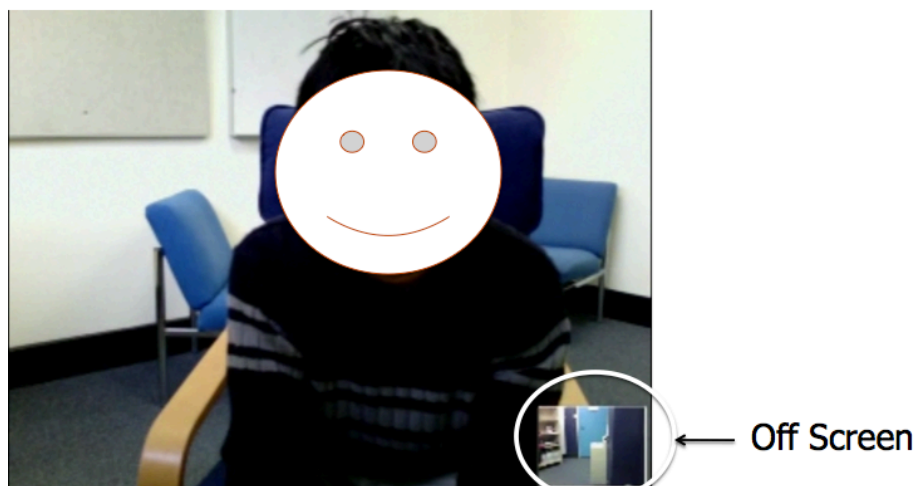


Figure 9: An example where the therapist moved out of screen. This image is from the perspective of the therapist. It is possible to see the participant but as the picture in-a-picture reveals, the therapist is not in the line of site of the videoconferencing camera.



Figure 10: An example of playing a recording of a prior session via a live videoconferencing session. This image is taken from the perspective of the participant. The larger image on the right displays the prior recorded session and the live session is displayed in the smaller picture on the left.

5.3.3 Stage 3: Sessions 18-27 (Development of Accurate Formulation)

As can be seen in Table 27, during this stage of treatment John began relying heavily on text-based communication. The content of this stage was characterised by periods of disclosure pertaining to high-salience content, which culminated in session 27 where a collaborative ‘to do list’ was devised that John agreed covered all the major issues bothering him that were implicated in the maintenance of his presenting difficulties.

5.3.3.1 Theme: Facilitation of High-Salience (Shame-Based) Disclosure

Only two out of the ten sessions during this stage contained a substantial proportion of verbal interaction. Hence, there was limited content disclosed verbally during this stage of his therapy, and the content that was disclosed had already been discussed via text. The disclosure of high-salience material was primarily achieved via text-chat and included new issues such as being homosexual, an addiction to masturbation during early adolescence, thoughts of raping and being raped, thoughts of raping people in the afterlife, the use of voluntary thoughts of paedophilia in order to intra-personally express anger or avoid anxiety, masturbating while having voluntary thoughts of paedophilia and stating directly for the first time: “*I’m afraid that I could be a paedophile*”. It is also important to note that the time it took John to begin discussing meaningful material was less than in previous stages of treatment. In

seven out of the ten sessions it took under five minutes and in the remaining three it took under ten minutes before meaningful content was being explored. Incidents of resistance, testing and challenging the therapist also occurred in this stage but the content was congruent with the level of intimacy and open expression that had been developed. For example, in session 20 John refused to say whom he was having intrusive thoughts about so the therapist asked him why he refused and what was so bad about the thoughts- to which he replied: “*What is so bad? What is this! Of course it is so bad!!! I don’t want to say who [the thoughts pertained to]*”. This kind of intensity of expression was only asserted via text.

During stage three John felt able to begin making use of writing material outside of sessions. Sometimes these were used to guide what he wanted to talk about in session and at other times he left the material for the therapist to read in his absence. The written material provided information about topics that he found so anxiety provoking that he was not even able to mention them via text. Once the therapist had read the material however, John was then able to talk about them via text. After one of the significant disclosures John’ stated: “*I’m really glad I can tell you these things... and I kind of feel good that I got this out because, you know that at least one other person knows*”. Through this combination of written material and discussion via text more high-salient content was disclosed regarding thoughts of violent sex, pedophilia¹ and previous experiences of suicidal ideation, as well as material he had not disclosed in session such as the details of how the thoughts of paedophilia began and developed.

5.3.3.2 Theme: Unique Media Methods

Due to greater use of text-chat throughout stage three, the benefits of being able to see non-verbal expressions while typing became more pronounced. For example, at times the therapist made statements such as “*I’m sensing that this is hard to type, must be painful feelings, I admire your courage*”. In session 24 there was a particular moment John swapped back and forth between verbal and text communication, following which the therapist asked:

¹ Although John had obsessive thoughts and fears about being a paedophile, he was not a paedophile. The correct diagnosis was OCD.

Therapist: “What was it about that that made you feel like you couldn’t say it out aloud?”

Participant: “I could have said it I think but it was just easier for me to type it”

Therapist: “It’s a bit more confronting saying it out aloud?”

Participant: “Maybe... or... it might sound weird but um... I was too lazy to say it, I’d rather type it than say it um... um... yeah.... Well I just didn’t want to say it that’s all, I mean I think I could have said it, it’s not like... but yeah... it’s just easier to type it”

Although John was not being clear about why it was easier to type the response, it does suggest that the combination of video and text communication provided him with the interpersonal flexibility he needed to maintain the conversation. It was also discussed in session 18 that it was impossible for John to physically attack the therapist via videoconference, which may partly account for his preference to interact via video. Additional text-chat modifications were also observed, such as alluding to more information (“*because...*”), describing therapeutic presence (“*I’m here*”) and using the text material to challenge what John was currently saying (“*but above, you said...*”).

5.3.4 Stage 4: Sessions 28-40 (*Working Through*)

During stage four John began addressing his issues in a forthright and honest manner. Four of the sessions included no text-chat, and the only session conducted solely via text was due to technical difficulties as opposed to interpersonal anxiety. John did however continue to use text-chat to communicate and discuss issues that he found too anxiety provoking, such as intrusive and/or voluntary thoughts that were occurring in the moment. Content that had already been disclosed in prior stages/sessions was mostly discussed verbally. Signs of progress were evident, such as reporting success at reducing some compulsions, reducing avoidance of particular places, expressing his personal wishes instead of having voluntary thoughts of rape to cope with his frustrations, and in the 39th session John stated: “*I know now that I am not a paedophile or dangerous*”. Even though the alternative media was not used to overcome interpersonal anxiety to the same degree it was in prior stages, it still had an influence on how some of the interventions were conducted, which in turn affected participant engagement.

5.3.4.1 Theme: Altering/Emulating In-Person Clinical Methods

When interacting in person cognitive restructuring is typically conducted on a whiteboard or on a piece of mutually available paper. This issue was solved via videoconference by opening a Microsoft Word document on the participant's computer, which could be controlled remotely via the therapist's computer, thus allowing both therapist and participant to input material onto a shared workspace (see Figure 11). Working via this shared media made it possible to edit and rearrange the content more easily than when working with non-digital media.

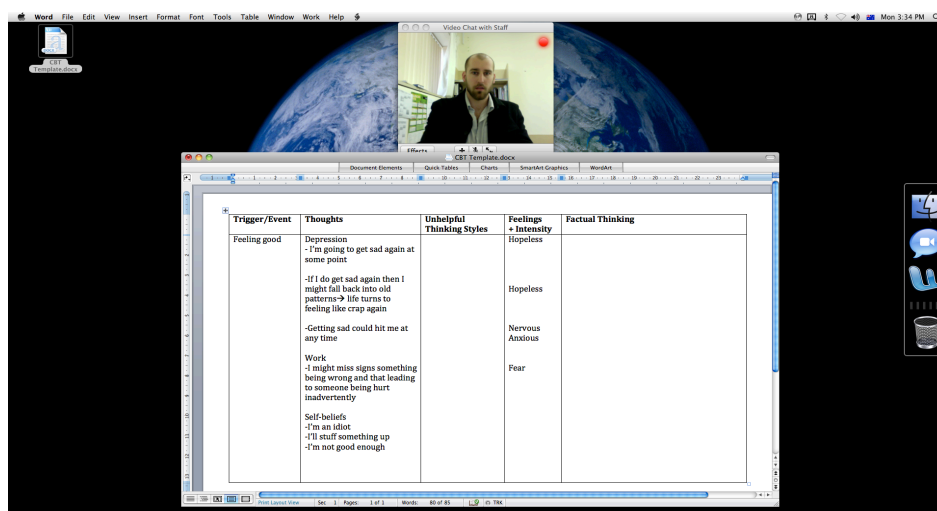


Figure 11: An example of conducting cognitive restructuring via videoconferencing technology. This picture is taken from the perspective of the participant. The small upper window displays the image of the therapist and the larger window below displays the Microsoft Word document.

The cognitive restructuring was followed by a behavioural exposure experiment where John lent back in the chair for 30 seconds, firstly with the therapist looking away from the screen at a 90° angle, then a 45° angle, and finally again while looking directly at him. The purpose of this experiment was to challenge his fears of exposing his penis or masturbating in front of the therapist if he stopped his avoidance of leaning back in the chair. After this exercise John stated that he originally thought that the chair was flatter, similar to a dentist chair- *“it’s kind of weird but I’ve only just realise that just then, it’s not like how I thought it was”*. Other experiments were also possible via videoconference, such as exposure to direct eye contact and

traditional exposure-response prevention exercises. For example, in session 38 John and the therapist touched the bottom of their empty bins and resisted the desire to wash their hands (see Figure 12).

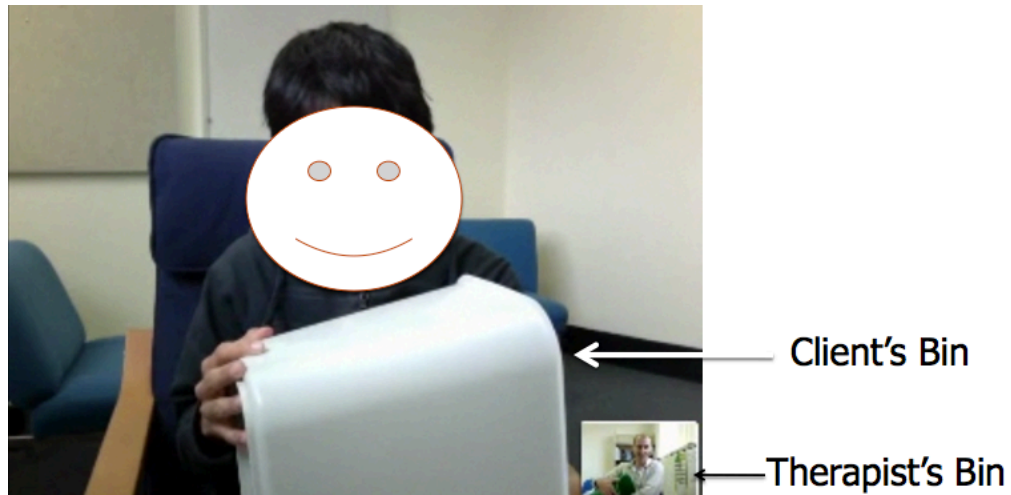


Figure 12: An example of exposure therapy via videoconference. This picture is taken from the perspective of the therapist. The large window displays the participant touching the inside of the bin with his left arm and the smaller image to the right displays the image of the therapist touching his bin.

5.3.4.2 Theme: Unique Media Methods

An additional method of interacting with the participant via videoconference was identified during this stage. In light of the reduction in interpersonal anxiety that was observed during stage two when the therapist moved out of screen, the therapist began to wonder if the anxiety was limited to the presence of his face. Furthermore, as a result of John frequently looking down and away from his face it was often difficult to see his facial emotions. Therefore, as a partial solution the therapist decided to see what effect obscuring his face with another computer window would have on the interaction (see Figure 13):

Therapist: “Is this somehow so much better”

John: “(he looks up and smiles) Yeah, because I can’t see your face”

Therapist: “So it is really limited to my face, or is the problem with the eye contact?”

John: “Yeah, I wonder if you just covered your eyes, I wonder if that, I wonder how comfortable I will be?”

Therapist: “Let’s find out... is that better?”

John: “The thing is, I’m not, since I’m not looking, I’m not really looking at you I’m just looking at that window, so that’s why I can stare at that spot in the screen without looking away”

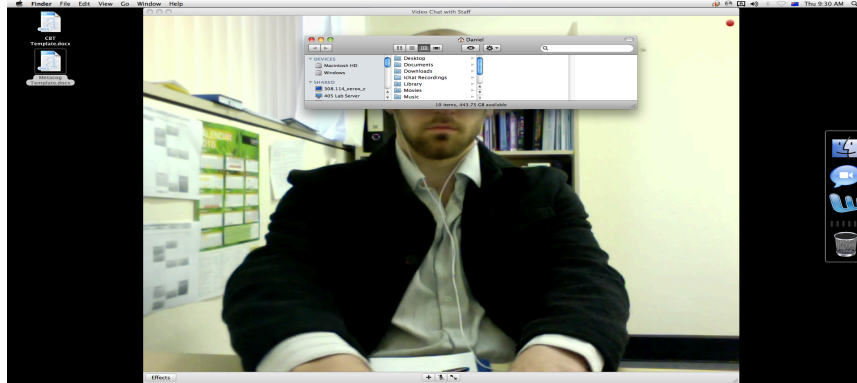


Figure 13: An example obscuring the therapist’s eyes using a computer window. This picture is taken from the perspective of the participant.

The benefit of obscuring the therapist’s eyes was that it allowed John to look directly at the screen, which made it easier to see his facial emotions. However, this technique was not continued for the entire session due to the implementation of eye contact exposure. This technique would not have been possible in person and was useful for providing a graded level of direct eye contact exposure. Furthermore, it was also helpful in session 34 for facilitating John’s communication via text and making his emotions more visible when he was discussing a distressing issue.

John: “Well today when you were talking about those thoughts of young girls genitals, I felt down there ‘blood rushing there’ (facial emotion indicated disgust) I hope you know what I mean. By-the-way, I am so glad that you put the typing window in front of your face”

Therapist: “I thought you might like having it in front of my face. So... you felt yourself [becoming aroused] when I was describing it?”

John: “Perhaps”

Therapist: “But your facial expression was the complete opposite, you didn’t look aroused”

This capacity to hide a part of the therapist face from the participant’s view but without compromising the therapist visibility of the participant could only have been achieved through the technology.

5.3.5 Overall Technology Issues

Although the overwhelming majority of sessions throughout the course of John’s treatment proceeded without a problem, there were several technology-based issues that effected participant engagement. For example, in session 16 the sound stopped working and the program had to be restarted. In session 17 it became evident that although video-media could be played through the software at the same time as the session was being recorded, it did not have the capacity to also deliver the audio of the recording. This issue was overcome by showing the video again but without recording that part of the session. It is hoped that future videoconferencing systems will have the capacity to both record and play media files simultaneously. In session 22 John began typing and continued typing for quite some time, however the content of his text was not being displayed on the therapist’s screen for an unknown reason. Consequently, John had a 10-minute conversation with himself. This was resolved by restarting the text chat. The final issue occurred in session 30 when the sound was working on both computers but for an unknown reason the sound was unable to transmit via the videoconferencing software and restarting the program did not solve the problem, hence the remainder of the session was conducted via text. Despite the technical problems, none of them completely prohibited the participant from engaging in therapy. However, it does highlight the need for therapists who are working via alternative forms of communication to have sufficient knowledge of the media, so that problems can be rectified in a timely fashion, and/or have access to substitute media if the technical difficulties cannot be easily resolved.

5.3.6 Treatment Outcomes

Unfortunately treatment was not able to continue beyond the 40th session due to practical research constraints. The main research trial that John had originally been a part of was drawing to a close. As can be seen in Table 28, although John’s

Table 28
Clinical Outcomes For Participant In Study Two

| Measure | Before | | | |
|----------------------|-----------|--------------------------|--------------------------|--------------------------|
| | Treatment | 12 th Session | 36 th Session | 40 th Session |
| DASS | | | | |
| Depression | 10 | 12 | 10 | 12 |
| Anxiety | 8 | 4 | 8 | 8 |
| Stress | 8 | 12 | 12 | 20 |
| QLES-Q | 3.12 | 2.76 | 3.35 | 2.94 |
| OCI-R | 30 | 28 | 24 | 30 |
| WAI-Client | | | | |
| Goal | | 4.25 | 3.75 | 5.5 |
| Task | | 3.25 | 4.25 | 5.75 |
| Bond | | 3.75 | 4.75 | 5.25 |
| WAI-Therapist | | | | |
| Goal | | 5 | 6 | 6.3 |
| Task | | 4.25 | 6 | 5.5 |
| Bond | | 5.25 | 6.25 | 6.3 |
| CSQ | | 21 | 17 | 24 |
| TSQ | | 43 | 42 | 56 |

symptom data on the DASS (Lovibond & Lovibond, 1995), QLES-Q (Ritsner et al., 2005) and the OCI (Foa et al., 2002) did not improve during the course of treatment, his scores on the WAI (Tracy & Kokotovic, 1989) marginally improved and his scores on the CSQ (Larsen et al., 1979) and TSQ (Yip et al., 2002)) indicated moderate satisfaction. However, these scores are to be interpreted with caution given that each measure took him several hours to complete due to severe obsessing about each answer. Furthermore, given the severity and complexity of Johns presenting problems, the standard quantitative ways of determining improvement may not be the most informative. The main issue being addressed in this study was the degree of participant engagement. With regards to engagement, several important observable

behavioural changes did occur, such as increased attendance, punctuality, eye contact and open honest disclosure, which are extremely difficult to foster in clients such as John.

Another complicating issue that may potentially obscure treatment effects is John's changes in medication. When John's parents learnt that his current course of psychotherapy was drawing to a close they decided to encourage John to stop his medication. From the 35th session John was taking two thirds of his original dose and by the 40th session he was taking half. This change in medication was not done with the consent of his general practitioner or psychiatrist. In the author's professional opinion, when John ended psychotherapy at the 40th session he was approximately half way through his treatment. He had disclosed almost everything that seemed relevant and had arrived at the working through stage of therapy. John was referred back to his general practitioner to be recommended for additional psychotherapy at the nearest relevant government service.

5.4 Discussion

The findings of this study are mixed. The findings of the qualitative analysis suggest that videoconferencing technology can be used to facilitate client engagement and enable new methods of client-therapist interaction. However, John received almost a year of therapy with little quantitative improvement or significant relief in his symptoms. Even if the quantitative measures are regarded as invalid (due to the length of time taken to complete items, which were reportedly chosen at random in the end due to so much indecision) the length of therapy alone can be used to support the presumption that the videoconferencing technology may have helped facilitate interpersonal avoidance. Unfortunately the design of this case study does not enable comparisons to be made between what did occur and what could have occurred in an in-person setting. Furthermore, this case study was an exploratory one hence its purpose was to explore the effects that the digital media appeared to have on John's engagement with psychotherapy. Therefore, this discussion will primarily focus on what the findings of the qualitative analysis appear to indicate and the future research directions that could be taken.

Disclosing unwanted and distressing intrusive thoughts is a key component of CBT for OCD because it comprises the first step in breaking the cycle of avoidance by increasing exposure to the feared thoughts (Sookman & Leahy, 2010). In this case

study the technology appeared to improve the client's ability to disclose clinically relevant material, which is an important component of evidence-based treatment. The participant appeared to find alternative forms of communication, such as writing, video and combined videotext, to be less interpersonally anxiety provoking than in-person communication which in turn enabled him to disclose and/or continue discussing high-salience issues even in the presence of strong feelings of shame, guilt and embarrassment. Furthermore, combined videotext interaction appeared to provide the participant with an optimum level of interactional flexibility because it allowed him to switch to text-based communication when discussing distressing issues and return to video when able, which prolonged periods of participant engagement. The technology also enabled the therapist to reduce the participant's interpersonal anxiety by either moving out of screen or obscuring the participant's view of the therapist's eyes, as well as using the session recordings to challenge the participant's perceptions, all of which lead to new clinical insights and observations. The combined video and text communication was able to overcome some of the limitations of text-chat (lack of non-verbal information) without sacrificing the benefits of text-chat (decreased interpersonal anxiety). Hence, combined video and text should be regarded as a specific process technique that can be used to help facilitate client engagement in therapy.

There were some instances where the technology malfunctioned and briefly impeded participant engagement. However, although malfunctions occurred they did not prohibit the participant's potential to engage in treatment. Such technological malfunctions may not always result in positive outcomes, particularly if the therapist is not competent at problem solving and addressing issues with the technology or if the client is less tolerant of communication difficulties.

As noted earlier, self-disclosures regarding high-salience therapeutically relevant material are one of the strongest indicators of client engagement (Farber, 2003) but strong feelings of shame (Kelly, 1998) and/or fear of negative therapist reactions (Teyber, 2006) can inhibit such disclosures. It appears evident in the above case study that the client overcame such feelings by switching to a less interpersonal anxiety provoking media to continue expressing himself. Hence, Day and Schneider's (2002) assertion that access to a flexible range of media may help some clients better engage in therapy was supported, as was prior research indicating that some people may express their 'true selves' when communicating via text-based media (Barak et

al., 2008). The comments made by the participant in this study are congruent with the comments made by the participants in previous research (Simpson et al., 2005) who stated that they too felt more comfortable and relaxed via videoconference than they would have in-person.

Teyber (2006) states that for some clients “their greatest need [in therapy]- and perhaps their worst fear- is for the therapist to “see” them, because they have learned how to be invisible” (p.221). Hence, engaging interpersonally avoidant clients in clinical practice can be difficult because they are likely to avoid expressing themselves in an open and honest manner, which in turn is likely to thwart client engagement and ultimately clinical progress. The findings of this study suggest that for clients experiencing interpersonal anxiety or strong feelings of shame and embarrassment regarding their issues, interacting via digital media may facilitate open and honest communication to a greater degree than the client would have been able to achieve in-person.

It is also important to note that the technology in and of itself does not solve problems pertaining to client engagement, as therapist skills and techniques were also necessary to facilitate the client’s engagement. For example, there were many moments John was having difficulty continuing the discussion verbally and then made a switch to text-based communication, but what he typed initially was not much more specific than what he had eluded to verbally. Consequently, the therapist had to use typical clinical skills such as paraphrasing, empathizing, and probing for more information before further detail was revealed via text. Thus, it seemed to be the interaction between the use of the technology and the implementation of standard clinical skills that aided the progression of client engagement.

Some clinical techniques, such as role-playing, required minimal modification from in-person procedures whereas other techniques did require modification due to the constraints of the media, such as limiting exposure exercises to activities in the room and using screen sharing to construct cognitive restructuring worksheets. The important observation regarding the implementation of these clinical techniques used in this case study is that the alternative media did not prevent any of these standard clinical techniques from being utilised.

An additional finding in this study is that videoconferencing technology can provide access to clinical techniques that are unavailable in-person. As described above, being able to move out of sight from the camera and being able to obscure

one's face from the participant with a computer window enabled interpersonal dynamics to occur that could not have been achieved in-person. If a therapist left the room in an in-person session they would no longer be able to interact with the client, nor could a therapist cover their face and still see the client. The replay of sessions can also be used and integrated with therapy. These findings indicate that the specific benefits of interacting via digital media over in-person treatment may not be as elusive as Richardson et al. (2009) assert.

However, there are several limitations that need to be noted. As was the case in study one, being in a different room within the same building is different than having the client located in a geographically remote location. It is possible that this may have an effect on how comfortable a client is with the interaction via videoconference. Another issue to consider is the change in John's medication that occurred towards the end of treatment. The reduction in medication may have obscured treatment effects. Also, as noted earlier, the lack of significant change over the course of almost a year may indicate that therapy via combined media was not particularly useful to this participant. Furthermore, it is also plausible that the technology helped the participant to maintain their interpersonal avoidance. However, this is unlikely to be the case given that in stage four of therapy, after the majority of confronting details had been expressed, he began engaging in more video-based interaction than text of his own volition. This trend suggests that once the technology had been used to facilitate disclosure John was then able to discuss the disclosed issues in a more interpersonally engaging manner.

A further issue to consider is if the increase in disclosure occurred because of the length of treatment as opposed to the use of the technology. It is possible that as rapport built over time, so did the increase in disclosure and honest engagement. Although this is a valid explanation, it is an unlikely one. First, the marked increase in disclosure that occurred directly after the interjection of text-chat into the therapy suggests that the changes in engagement were linked to the use of the technology. Second, several of the technology based techniques, such as moving out of screen and the playing back of session recordings, led to new clinical insights that were linked to the use of the technology and not a mere artefact of time. Third, by the later stages of therapy John disclosed information via text and once that occurred he was able to continue discussing it via verbal exchange. This pattern suggests that without the technology the flow of conversation would likely have been interrupted due to

intolerable levels of interpersonal anxiety when revealing new information and/or deeply shameful information. However, this third point is built on the assumption of what would have been likely to occur in-person, which cannot be determined in this instance. A final issue to consider is if combined text chat would have been useful to John if therapy had continued. Although this case study suggests that psychotherapy provided via combined videotext maybe of use to some clients, no conclusions can be drawn about whether or not the technology eventually becomes a roadblock to addressing interpersonal anxiety. It is possible that once the technology is used to facilitate engagement and disclosure that the focus of therapy needs to shift to in-person encounters to further address the interpersonal avoidance. Nevertheless, this case study has been successful in identifying new ways of implementing videoconferencing and text-chat technology that maybe useful for helping clients engage in therapy.

This case study represents an initial step towards exploring the benefits of videoconferencing technology for clinical interactions. However, further research is needed to fully understand the impact of the technology on client engagement and clinical outcomes. Future research directions include determining what kinds of clients are likely to use and benefit from text-chat during videoconference. Further qualitative investigation could be conducted exploring clients' and therapists' opinions of using the combined technology. This case study is, to the authors' knowledge, the first study to investigate the effects of combined videotext media on client engagement in a clinical psychology context.

In conclusion, the findings from this study suggest that digital media may be useful in facilitating client engagement and enable the use of new therapeutic techniques. Furthermore, this study suggests that not all severely disordered and complex clients are inappropriate for treatment via videoconferencing and moreover, some may prefer treatment via such media. However, the technology was not devoid of practical limitations and several of the clinical interventions required modification in order to be conducted via the media. Also, given the length of therapy and poor quantitative clinical outcomes it is unclear if the combined media format is effective in reducing clinical symptoms. Nonetheless, the findings of this study are sufficient to justify further investigation into the role that technology may have in improving clinical interventions above and beyond what can be achieved in-person.

5.5 Chapter Summary

Study two of this thesis is, to the author's knowledge, the first study to investigate the potential effects of telemental health on clinical engagement with a participant that presented with severe OCD and an array comorbid personality disorders. The findings from the qualitative analysis suggest that the use of a range of media including, writing, video and combined videotext interaction helped the participant remain engaged in the clinical interaction. Furthermore, the technology enabled novel ways of interacting with the participant to occur, which led to new clinical insights during the course of therapy. Despite these preliminary findings further research is still needed to determine if the findings observed with this participant extend to other cases. It is also unclear if these new techniques and the effects of reduced interpersonal anxiety result in outcomes that are better than in-person methods. However, this research has demonstrated that treatment via videoconference may not necessarily be inappropriate for all severe clients and has provided cause for further investigation into the potential benefits over in-person interactions for some client groups.

Chapter 6: General Discussion And Conclusions

This thesis began with a brief literature review on CBT and an in-depth review of telemental health research. From these literature reviews it was evident that CBT is a scientifically validated form of psychotherapy applicable to a wide range of clinical disorders and videoconferencing is a technology suitable for providing remote CBT. If CBT via videoconference is as effective CBT in-person then it may be possible to decrease the disparity in care between metropolitan and rural/remote clients. Thus the overarching aim of this thesis was to use methods of scientific inquiry to expand current knowledge regarding the effectiveness of CBT via videoconference.

More specifically, study one aimed to determine if CBT administered via videoconference results in a reduction in client symptoms and an improvement in quality of life that is comparable to what is achieved in-person. Furthermore, study one aimed to address if the working alliance, client satisfaction and treatment credibility was significantly different between in-person and videoconference-based CBT. Study two aimed to investigate how the digital media influenced client engagement and the clinical experience.

This chapter will begin by summarizing the results of study one (a RCT comparing in-person to videoconference-based CBT) and study two (an in-depth case study of a participant who was treated via combined videoconference and text). The findings of these studies have several implications for clinical practice that will be discussed below. Following this the barriers to further implementation of videoconferencing technology and directions for future research will be discussed. Finally some closing comments will be provided.

6.1 Restatement of Results

6.1.1 Study 1

The purpose of study one was to conduct a RCT comparing the effectiveness of CBT administered via videoconference to in-person. Symptoms of depression, anxiety and stress, and quality of life were measured at pre, post and 6-weeks following treatment. Participants had mixed comorbid diagnoses. In order to capture treatment effects specific to the participants' presenting disorder, disorder specific measures were also administered at pre, post and 6-weeks following treatment. The

working alliance, client satisfaction and the participants' perceptions of the credibility of therapy were measured at post-treatment. The CBT intervention was based on manualised treatments, tailored to suit the needs of the individual participants.

The results indicated that the intervention was effective in reducing symptoms of depression, anxiety and stress, and increasing quality of life for participants in both conditions. This finding is congruent with prior CBT research (Butler et al., 2006) and videoconferencing research (Bouchard et al., 2004; Himle et al., 2006; Mitchell et al., 2008; Nelson et al., 2003; Simpson, 2006). Furthermore, the gains made from pre to post-treatment were maintained at follow-up and in most instances participants continued to significantly improve after treatment had ended. On the disorder specific measures 89% of participants in the videoconferencing condition and 50% in the in-person condition were identified as recovered. The results did not indicate a significant difference in treatment outcomes (depression, anxiety, stress and quality of life) between in-person and videoconference-based CBT. A preliminary investigation of non-inferiority suggested that treatment via videoconference is not inferior to treatment provided in-person, which was also congruent with prior research (Frueh et al., 2007; Morland et al., 2010). Finally, no significant differences were observed between conditions regarding the working alliance, client satisfaction and treatment credibility. This study demonstrates that a significant reduction in participant symptoms and an increase in end-state functioning can occur after only 12 sessions of videoconference-based CBT and the clinical outcomes are not significantly different from what is obtained in-person.

6.1.2 Study 2

The purpose of study two was to explore the effect that combined videoconference and text-chat had on the clinical engagement of a participant with severe and complex OCD across 40 sessions of treatment. The focus of the case study was the way that technology was used to influence participant engagement. A thematic analysis was used to analyse session transcripts, session notes and video footage. The findings suggest that making use of a variety of media, such as writing, video and combined videotext, helped the participant to remain engaged in therapy. The technology also made it possible to interact via videoconference in ways not previously reported in the literature, such as moving out of screen, obscuring the participant's view of the therapist's eyes, and replaying session recordings. The

analysis also revealed that it is possible to conduct several in-person techniques via videoconference, such as exposure exercises and thought diaries.

6.1.3 Integration Of Studies

The findings of study one and two in this thesis complement one another. Study one addressed the broader context of if treatment via videoconference is as effective in reducing participant symptoms and increasing quality of life as treatment provided in-person. Overall, the data indicates that it is, which is congruent with similar prior research (Fortney et al., 2007; Mitchell et al., 2008; Morland et al., 2010; Nelson et al., 2003). Study one also found, like prior research (Bouchard et al., 2004; Himle et al., 2006; Ruskin et al., 2004; Simpson et al., 2005) that the difference between in-person and videoconference-based ratings of the working alliance and client satisfaction are small to very small. Study two addresses the specific context of one participant and his experiences with the technology. The findings of study two demonstrate that although there are similarities between in-person and videoconference-based treatment, treatment via digital media does require some interpersonal modification. Furthermore, treatment via videoconference can provide new ways of interacting with clients and some clients find interacting via the technology less interpersonally anxiety provoking. Combined, the findings across the two studies indicate that CBT clinical outcomes are not compromised via videoconference and the technology can enable new ways of engaging clients¹. Directions for future research regarding these issues are provided below in Section 6.5.

6.2 Implications For Clinical Practice

6.2.1 Study One

The findings of study one, in conjunction with prior research (Richardson et al., 2009; Simpson, 2009), indicate that videoconferencing is an appropriate and effective way of providing remote mental health services. Prior efficacy focused research using restricted diagnostic categories and treatment approaches have demonstrated that CBT treatment via videoconference can be as effective as in-person treatment for a variety of disorders, such as bulimia (Mitchell et al., 2008), PTSD

¹ Several other examples of how the technology in study one influenced the client-therapist interactions are provided in Appendix F.

(Morland et al., 2010; Morland, Green et al., 2011) and panic disorder (Bouchard et al., 2004). Strictly controlled efficacy-based studies have been criticised for being somewhat irrelevant to clinicians who practice outside of an academic environment (Persons & Silberschats, 1998). The validity of this assertion is not germane to the aims of this thesis and therefore will not be addressed but it is worthy of mention because it is a commonly held belief among many clinicians (Persons & Silberschats, 1998). The findings of study one help to bridge the void between academia and the vista of flexible real-world practice. By involving a mixed diagnostic participant group with a semi-structured treatment approach study one demonstrates that the results of strictly controlled efficacy studies also apply to varied participant groups and individualised treatments.

It could be argued that there may be differences between participants who agree to take part in research and face the prospect of randomisation compared to participants who seek treatment in the community. For example, clients who choose to participate in research are aware that they are providing data for a researcher therefore there may be higher in altruism than clients who choose not to be participants. However, Nathan et al. (2000) note that “although it is theoretically appealing to assume that patients who seek treatment actively in community settings are different from those who enter research... there are no data to date that have substantiated this view” (p.511). Therefore it can be assumed that the data from study one does have relevance to real-world practice. Although further research involving multiple clinicians is needed to expand the current findings (see Section 6.6), the results of study one and that of prior research together support the efficacy and effectiveness of videoconference-based psychotherapy. Once a psychologist has familiarised him or herself and has become confident in the use of the technology s/he can expect clinical outcomes that are congruent with in-person treatment outcomes.

The findings of study one also extend to the clinical interaction. Due to concerns of how the videoconferencing technology might negatively affect the working alliance, some clinicians are resistant to interacting via videoconference, and this has been evident in some prior studies (Cukor et al., 1998; Kirkwood, 1998; Rees & Stone, 2005). However, the findings of study one and that of prior research (Simpson, 2009) indicate that the working alliance forged via videoconference is not significantly different from when it is forged in-person. This finding also applies to client satisfaction. Thus practicing clinicians can feel confident that providing

psychotherapy via videoconference does not compromise the working alliance or client satisfaction.

6.2.2 Study Two

The findings of study two provide only speculative recommendations regarding their implications for clinical practice. However, the findings do indicate several potential implications for clinical practice that may be worth considering. Study two demonstrates that videoconferencing can be merged with other related digital technologies, such as text typing, to expand the clinical experience for both client and therapist. Although it is unclear at this stage of research development if variations in the interaction are of significant benefit to client outcomes, it is clear that the possibilities of videoconference-based interactions expand beyond simply being a second best alternative to in-person interactions. Study two demonstrated that creativity plus flexibility regarding the clinical interaction via videoconference can lead to new ways of interacting with clients, such as moving out of screen to influence the interpersonal dynamic. The events reported in study two also suggest that the digital technology can augment the therapy process. For example, combined text-video provides a log of the clinical dialogue, which may help clients with a short attention span to follow the conversation. However, as noted earlier, such adjustments do not appear to compromise the effectiveness of videoconference-based CBT treatment.

6.3 Implications For The Field of Telemental Health

It was noted in chapter two Section 2.1 that in Australia there is a strong need for remote mental health services. Clients in rural and remote Australia may have to make a choice between seeing a nearby clinician that may not be trained in the needed intervention or travelling to a metropolitan area in the hope of receiving such services (Roufeil et al., 2007). Travelling to a metropolitan area is particularly problematic for mental health services because effective treatment can require multiple appointments. The findings of study one are congruent with prior research (Richardson et al., 2009; Simpson, 2009) indicating that treatment via videoconference is an efficacious and effective way of providing remote mental health services. Therefore, in places for which the technology is available, videoconferencing should be used as a way of providing specialised services to those in need.

As was discussed in Section 2.4, telemental health services, such as videoconferencing, can be of benefit to more than rural and remote clients. Videoconferencing technology could be used within metropolitan areas to provide clinicians with increased work flexibility and clients with more convenient access to services (Gorton, 2008). Clients that are frail or do not have adequate transport may one day be able to access specialised services from home or a near-by general practice.

Within the broader context of telemental health, study two demonstrates that the cross-pollination of digital media for providing mental health services is possible. Study two was primarily concerned with the merging of video and text-based interactions but there is little reason why digital clinical practice could not encompass other technologies. For example, remote clients could be treated using a combination of video, text and virtual reality exposure exercises, and possibly conduct computerised treatments for homework.

Despite the array of technologies that can be used to treat clients, a digital interaction might not always be what is best for the client. For example, Simpson (2009) notes that some clients may prefer to interact via a digital media because they are interpersonally avoidant and the technology helps maintain their avoidance. It could be argued that the participant reported in study two provides such an example. Although John stated that he preferred interacting via the technology, interacting via remote media may have also reinforced his interpersonal avoidance. Thus, the interpersonally avoidant client may be better served by receiving in-person treatment because it may provide a greater degree of interpersonal exposure than videoconference.

The converse is also possible, whereby a client prefers in-person interaction but they may therapeutically benefit more from having exposure to remote communication. Therefore it is recommended that clinicians practicing via digital media be mindful of if the technology is helping or hindering the client's therapeutic growth. It may also be appropriate with some clients to begin treatment via one form of media and then as therapy progresses transition into another form. For example, with a client who experiences anxiety in interpersonal interactions it may be better to begin treating them via a remote technology, then transition to in-person treatment sessions as the client improves, or vice-versa for the interpersonally dependent client.

6.4 Barriers to Further Implementation of Videoconferencing Services

There are several barriers to further implementation of videoconferencing services that are worthy of mention. The first barrier pertains to the dissemination of recent telemental health research. If clinicians are not informed of the recent research findings then they may harbour inaccurate beliefs about the utility of videoconference-based treatment. Collectively the research literature indicates that there is little difference between in-person and videoconference-based outcomes pertaining to cost-effectiveness, diagnosis, satisfaction and the working alliance, and there is growing evidence regarding treatment outcomes. Therefore clinicians should be informed of these research findings, which could be done through providing professional workshops aimed at educating clinicians.

The second barrier pertains to the training of clinicians and helping them adapt to the new technology. May et al. (2001) conducted an ethnographic study on the ways clinicians' resisted videophones in their clinical practice. They found that many clinicians in their study were willing to use video to interact with clients but when they began using it they found it difficult to practice via video in the same manner that they did in-person. Consequently many of the clinicians objected to practicing via videoconference. Typical adjustments include strict turn taking in conversations, minimal movement and greater use of verbal empathy. However, the study by May et al. was conducted on videophones as opposed to modern videoconferencing equipment and therefore it is unclear if clinicians will also be resistant to better quality technology. Nevertheless, the work by May et al. (2001) highlights the need to help clinicians adjust to interacting via new forms of media.

The diffusion of innovations theory (Rogers, 2003) posits that new technologies/innovations are adopted based on the relative advantage (how much better is the new innovation), compatibility (how much does the innovation fit with current skills), complexity (how easy is the innovation to learn and comprehend), trial-ability (how easily the innovation can be trialled) and observe-ability (do others see the positive outcomes from implementation). When a technology is lacking in these areas then it is unlikely to be adopted. At present, the converging evidence suggests that mental health services via videoconference are better than no treatment (Richardson et al., 2009) and they are cheaper than equivalent in-person services (Simpson, 2009). Also videoconferencing has been trialled in numerous settings (Grady & Singleton, 2011; Mannion et al., 1998; Nelson et al., 2004). Therefore

treatment via videoconference meets the criteria for advantage and trial-ability. However, digital interactions may require the clinician to adjust their way of interacting and it is not common practice to conduct sessions via videoconference. Consequently, there are some compatibility issues, which could be addressed with further training. There is also a lack of observe-ability, which will hopefully rectify with increasing clinician use of the technology as the field matures.

Rogers (2003) also asserts that the adoption of a new technology/innovation goes through stages; from knowledge (learning about the new innovation) persuasion (developing favourable attitudes), decision (beginning to adopt), implementation (using the technology), to confirmation regarding its use and acceptance. Although this is not always a linear progression, generally speaking, telemental health implementation is currently at the knowledge stage whereby ongoing learning about the innovation is still occurring. Therefore it may be some time before favourable attitudes develop on a large scale and decisions about adopting it into clinical practice begin to occur. If organizations such as the Australian Psychological Society and/or the Australian Health Practitioner Regulation Agency were to support clinicians and the provision of mental health services via videoconference through optional professional development training workshops then the process of technology adoption may be accelerated.

The dissemination of science typically goes through a series of linear stages from theory, to pilot research, to efficacy research, to effectiveness research and then if successful new technology becomes implemented. Glasgow and Chambers (2012) argue that the implementation of new technology in the field of health science has been slow because of adherence to this linear process. If new technology is to be adopted in a timely manner then a more dynamic approach to research may be needed. By designing research trials with stakeholders directly in mind the findings of the research may become implemented sooner (Glasgow and Chambers, 2012). For example, if the aim is to conduct RCT investigating the differences between in-person and videoconference-based treatment then it should be centred around the needs of a specific stakeholder that desires those services. The outcome of such a study would directly inform the stakeholder as to whether or not they should continue providing services via the new technology. If the results of such a study supports the use of the technology then the stakeholders and the organisation it represents can simply continue with the implementation of the technology. Whereas currently, many of the

telemental health RCT's have been designed and implemented in academic settings and external stakeholders have to extrapolate from the findings of that research to make decisions on whether or not they should adopt the technology in their own context. Consequently, the lack of research directly relevant to specific external stakeholders remains a barrier to further implementation of telemental health services

Johnson, Ford and McCluskey (2012) investigated how different methods of promoting new practices increased access and retention of best practice services within the context of addiction treatment. The aim was to increase service providers' use of best addiction treatment practices, such as providing a walk in treatment service, scheduling evening appointments, making the service easy for clients to find, and providing appointment reminders. The use of these practices was promoted in the media, national newsletters, professional newsletters, conferences and professional announcements at the state and local level, and the outcome data was the number of visits the website with further information received, the number of people who signed up to provide feedback on adoption and implementation of best practices and the frequency that service providers reported that they had implemented best practices. Data was also collected on professional peer influence. The results indicated that national professional newsletters produced both the largest Internet interest and likelihood of adoption. But the survey data indicate that peer staff was the greatest influence in shifting an individual service provider from considering adoption to implementation. This research indicates that in order to overcome barriers to adopting new technologies awareness needs to be increased through national professional media. Then if influential staff in an organisation learn to adopt the new technology, it becomes more likely that other staff members will also adopt the new technology. However, future research is needed to determine if these findings in the adoption of clinical technology also applied to the adoption of technological devices.

Another barrier that needs to be considered is the infrastructure to support videoconferencing services. Australia is the largest island in the world and for most of it there is less than 0.1 person per square kilometre (ABS, 1998). Some companies, such as SkyMesh (www.skymesh.com.au) can provide access to the Internet via a satellite to anyone in Australia regardless of their location. However, such services at present are limited to speeds of 512/128 kbps, which are not sufficient for providing high quality videoconferencing. The 3G networks provide Internet speeds of up to 42Mbps, which is sufficient for videoconferencing. However, 27% of Australia

households do not have access to these services (ABS, 2011) and therefore the people in these areas are unable to engage in high quality videoconferencing. Although the proportion of people with access to the Internet is increasing over time (ABS, 2011) it is unclear at this stage as to which model of service delivery would best serve the needs of rural and remote clients. For example, would it be best to place videoconferencing devices in remote GP-practices or would it be best to engage clients on personal computers in their homes? Also there is the issue of how best to integrate videoconferencing devices onto user-friendly software that clinicians find easy to use. At present there is no clear answer to these issues and it is likely that many different systems and models of service delivery will be trialled in the future. According to Lovejoy, Demireva, Grayson, and McNamara (2009) the way to advance the practice of online psychotherapy in the initial stages is by conducting ongoing research so that the barriers to implementation can be addressed, which should lead in-turn to future adoption of the technology.

6.5 Recommendations For Future Research

6.5.1 Non-Inferiority Analyses

All future RCT's comparing in-person to videoconference-based psychotherapy should be designed from the outset as a non-inferiority or equivalence trial and should be of sufficient size for adequate power. Many of the prior studies (Bouchard et al., 2004; Mitchell et al., 2008; Nelson et al., 2003) have employed statistical methods designed to see if one media for delivering therapy is significantly better than the other and were not intended to determine if one intervention is significantly equal to another. Greene et al. (2008) provide instructive guidelines on how to design a non-inferiority trial. However, as was the case in study one, obtaining a large enough sample for a sufficient test of non-inferiority can be challenging. But when the overall aim is to determine if one intervention results in outcomes that are 'as good as' another intervention a non-inferiority trial design is the most appropriate (Greene et al., 2008).

6.5.2 Longer Follow-up

Future studies should aim to have a longer follow-up time-period than that used in study one. For example, Mitchell et al. (2008) measured participant symptoms at both 3-months and 12-months following treatment. By measuring symptoms at

greater intervals after follow-up stronger assertions can be made about the enduring impact of the interventions.

6.5.3 Benefits of Videoconferencing Over In-Person

Although reduced cost is an obvious benefit, there are several other potential benefits of videoconference-based treatment (see Section 2.4 in chapter two). Examples include increased access to culturally relevant services, remote access to frail clients and increased clinician safety. However, it is not clear how to best implement videoconferencing services so that these potential benefits can become a reality. For example, does the implementation of videoconferencing services result in increased access to culturally relevant services or are there additional barriers that need to be overcome? Videoconferencing services assure clinician safety but are violent inmates accepting of treatment via videoconference and are the clinical outcomes equivalent to in-person? Future research should aim to determine to what extent these potential benefits are actually of benefit to clients.

Prior research (Simpson et al., 2005) along with the findings of study two indicates that some clients may find treatment via videoconference to be less interpersonally anxiety provoking than in-person treatment. Future research could aim to measure interpersonal anxiety through a questionnaire and assess the relationship between interpersonal anxiety and clinical outcomes. For example, do clients high in interpersonal anxiety benefit more from treatment via remote media than in-person?

Although non-significant, slightly better outcomes via videoconference (small to medium effect) compared to in-person were observed in study one and in some prior studies (Fortney et al., 2007; Nelson et al., 2006). It is possible that this slightly better but non-significant effect may become significant in a meta-analysis if this trend continues. Such a difference could either indicate allegiance effects or it may reflect that treatment via videoconference results in slightly better outcomes. At this stage of research development it remains unclear, but it is a trend that should be noted if it occurs in future research.

6.5.4 Different Clinical Settings

Preliminary videoconferencing research has begun in areas pertaining to inpatient (Grady & Singleton, 2011), emergency services (Mannion, Fahy, Duffy, Broderick, & Gethins, 1998) and incarcerated individuals (Nelson et al., 2004).

Again, further RCT's are needed to ascertain if the findings of outpatient studies also apply to other clinical settings. There is little reason thus far to assume that services in these environments would result in different outcomes but until such research is done it will remain unknown. Initial pilot case studies are also needed to determine how telemental health services can best be provided to private homes. Given the increasing use of videoconference-based social media software, such as Facebook and Skype it is likely that future health providers may administer mental health services directly to a client's personal residence. Such availability may increase the frequency with which clients use mental health services. Given that such technology is already integrated into modern computers and does not require additional costs, such as independent telephone lines and a dedicated videoconferencing device, clinicians may be more willing to integrate such services into their existing practice. Future pilot research is also needed investigating the effect of mobile videoconferencing devices, such as the iPhone and iPad, upon telemental health services. Important questions include; do mobile devices increase accessibility to services, what are the unique ethical and legal issues associate with the use of mobile devices, and is psychotherapy via mobile devices as effective as when provided via stationary videoconference devices? Qualitative research will also be needed to determine what effect a handheld videoconferencing device has on the clinical interaction. For example, if a client is pacing around the room with the device in their hand, how does this affect a clinician's satisfaction with the media and their ability to observe what is happening in the room?

6.5.5 Remote Versus Distal Interaction

As noted above in the Limitations Section 4.3.5, the participants in study one may have felt comfortable interacting and doing exposure exercises via videoconference because they knew that their therapist was within the same building. If something went wrong it would be possible for the therapist to intervene. In a prior study (Cowain, 2001) where the clinician was remotely situated from the participant, it was noted that the participant was concerned about the therapist being far away and not able to intervene if something went wrong in an exposure exercise. Once the efficacy and effectiveness of videoconference-based treatment is firmly established it will then be important to see if the degree of physical distance plays a role in treatment compliance and treatment outcomes. For example, clinical outcomes could

be compared between participants receiving treatment from a therapist that is in the same building, to when the therapist is in a different city or country.

6.5.6 Digital Compensation

Ideally, it would also be advantageous to determine how much the adjustments needed for interaction via videoconference influence clinical outcomes. For example, sometimes when interacting via videoconference the clinician has to rely on verbal empathy to a greater extent than when interacting in-person. It may be beneficial to conduct some qualitative interviews with participants who take part in larger RCT's to determine how such adjustments influences their experience of the clinical interaction. The findings of qualitative research could then be used to develop guidelines for clinicians on how to best adjust their interpersonal behaviour to accommodate the digital media.

6.5.7 Matching Services To Client Needs

Again, once treatment via videoconference has been extensively researched it may then be necessary to turn attention towards the potential interaction between media and personality. For example, by obtaining a measure of both a client's personality and their symptom measures from pre, post and follow-up it may then be possible to determine which kinds of clients are most likely to benefit from which media; in-person, videoconference, text, telephone, computer-aided or a combination.

6.5.8 Inter-rater Reliability of Diagnosis

Future studies should aim to administer structured diagnostic tools, such as the SCID, via videoconference and have the primary therapist and an external clinician independently diagnose the participants. This would allow the inter-rater reliability of the diagnosis to be determined, which would help determine the accuracy of the diagnosis of participants in the study and thus increase the internal validity of the study.

6.5.9 Specific RCT Treatment Populations

Some prior RCT videoconferencing research has been conducted with disorder specific populations (Bouchard et al., 2004; Mitchell et al., 2008; Morland et al., 2010; Morland et al., 2011) and the research in this thesis has expanded these findings

by demonstrating a degree of effectiveness with a mixed diagnostic participant groups. However further RCT's are needed on disorder specific populations. For example, at present there are no RCT's in the videoconferencing literature pertaining to generalised anxiety disorder, bi-polar, psychosis or social phobia. Therefore it will be important to replicate studies such as that conducted by Mitchell et al. (2008) and Morland et al. (2011) but with different clinical disorders.

6.5.10 Mixed Methods Research

Like the research associated with this thesis, future research should aim to encompass the use of both quantitative and qualitative research designs. Large RCT's consume a substantial amount of resources and time therefore it can be beneficial to conduct adjunct research projects to help provide depth to the quantitative research. Qualitative methods could include focus groups and direct observation to collect data regarding user experiences of telemental health technology. Questions could also be explored as to whether or not the pace and content of language used via telemental health is different from what occurs in-person. Qualitative analysis using methods such as discourse and content analysis may be possible along side quantitative research if a mixed design is developed from the outset of the research.

6.5.11 Training Graduate Students In Telemental Health

Future qualitative research needs to be conducted to investigate graduate student perceptions of telemental health services. It is important to find out if new professionals who are already familiar with the technology are open to using telemental health technology in their future practice. If graduate students are found to be resistant to using the technology then research will need to be conducted as to whether or not education programs and workshops involving the technology increase graduate acceptance of the technology.

Although only one clinician was involved in the research associated with this thesis, the experiences of the author may be useful in guiding future graduates in the use of CBT over videoconference. It is the author's opinion that learning to interact via videoconference for clinical purposes should be done in-vivo by role-playing client-therapist interactions (or engaging in supervision with an experienced telemental health clinician) and be preceded by little or no training leading up to the practice session. The reason being that many of the limitations of videoconferencing,

such as a limited visual view, not making quick movements, adjusting eye contact and greater reliance on verbal interaction are intuitively realised and comprehended within a few minutes of interacting via the media. Then once already interacting via the media the graduate can be taught specific skills likely to be unique to the software they are using, such as working with digital whiteboards or engaging in simultaneous typing and video. Behavioural experiments within the context of CBT should be devised around the needs of the client; therefore creative experiments limited to the client room need to be devised. Graduate clinicians can't be taught creativity but it may help if they practice a few scripted exposure activities via videoconference with their supervisor, such as touching something dirty in the room (OCD treatment related) or engaging in a hyperventilation activity (panic disorder treatment related). Training regarding working with cognitive worksheets via videoconference will be dependent on what additional technology and software is available to the graduate, such as the ability to control the client's computer or the ability to scan client documents through to the therapist. Such differences means that each telemental health service will be slightly different, particularly as technology changes and advances, therefore universal videoconference-based training sessions may be of limited use. It may be better to allow the student to interact via videoconference with an experienced clinician so that they can learn in-vivo how to work via their unique telemental health circumstances.

6.5.12 Suggestions For Future Research

In light of the findings presented in this thesis and the current evidence in the literature the most logical next step for future research is to conduct more RCT's, preferably multisite investigations. Future RCT's need to be focused on a chosen clinical disorder and be designed around a non-inferiority analysis with three, six and 12-month follow-up measures. Given the resource intensive nature of RCT's it may be advantageous to plan concurrent qualitative studies within larger RCT's aimed at further investigating the specific benefits and limitations of treatment via videoconference. In the long run, once multiple RCT's have been done meta-analyses could then be conducted which should provide more conclusive evidence about the efficacy and effectiveness of videoconference-based psychotherapy.

6.6 Conclusions

Technology will continue to expand and improve at a rapid pace. Therefore it is important that researchers and clinicians continue to keep abreast of these new developments and conduct on-going research in order to appropriately investigate them. As technology becomes more integrated with our everyday lives it is likely that consumers of mental health services will begin to demand services that are convenient and accessible. Videoconferencing technology is ideally suited to such demands. The results of this thesis provide important data supporting the continued implementation of telemental health services, and in particular videoconferencing.

Together, the two studies in this thesis support the effectiveness of videoconference-based mental health treatment and illuminate the directions for future research. It is hoped by the author that this thesis is used to provide empirical support for the use of videoconferencing technology to provide remote psychological services and to inspire future directions for telemental health research.

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doi:10.1016/j.chb.2008.06.003

Every reasonable effort has been made to acknowledge the owners of copyright material. I would be pleased to hear from any copyright owner who has been omitted or incorrectly acknowledged.

Appendixes

Appendix A: Curtin University Human Research Ethics Committee Ethics Approval Letter

memorandum

| | |
|---------|--|
| To | Dr Clare Rees Psychology |
| From | A/Professor Stephan Millett, Chairperson, Human Research Ethics Committee |
| Subject | Protocol Approval HR 97/2009 |
| Date | 8 May 2009 |
| Copy | Dr Lynn Roberts, Psychology Daniel Robert Stubbings, Psychology Graduate Studies Officer, Faculty of Health Sciences |

Curtin 
University of Technology

Office of Research and Development
Human Research Ethics Committee

TELEPHONE 9266 2784
FACSIMILE 9266 3793
EMAIL hrec@curtin.edu.au

Thank you for your application submitted to the Human Research Ethics Committee (HREC) for the project titled "The Efficacy & Effectiveness of Videoconference-Based Cognitive-Behavioural Therapy for the Treatment of Psychological Disorders: A Multi-Method Investigation". Your application has been reviewed by the HREC and is **approved** subject to the conditions detailed below:

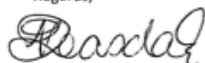
1. Please amend the Participant Information Sheet – Clients as indicated below and provide a copy of the new version the Research Ethics Office.
 - a. The language of this Information Sheet is perhaps too technical for the clients. The language is suitable for the therapists but not the clients.
 - b. To resolve this please include a cover page to the Client PIS which provides a half page overview of what the project is about and what is required of participants.
 - c. Please ensure this is written in very simple plain English. Refer to the Guidelines on the Ethics Website <http://research.curtin.edu.au/guides/human.cfm#Consentforms>
 - d. Please include the sentence stating 'see over for more detail of the project'.

Please do not commence your research until your response to the above conditions has been approved by the Executive Officer.

Please note the following:

- Reference Number: **HR 97/2009**. Please quote this number in any future correspondence.
- Approval of this project is for a period of twelve months **01-09-2009 to 01-09-2010**. To renew this approval a completed Form B must be submitted before the expiry date **01-09-2010**.
- If you are a Higher Degree by Research student, data collection must not begin before your Application for Candidacy is approved by your Divisional Graduate Studies Committee.
- The following standard statement **must be** included in the information sheet to participants:
This study has been approved by the Curtin University Human Research Ethics Committee (Approval Number HR 97/2009). If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth, 6845 or by telephoning 9266 2784 or by emailing hrec@curtin.edu.au.
- It is the policy of the HREC to conduct random audits on a percentage of approved projects. These audits may be conducted at any time after the project starts. In cases where the HREC considers that there may be a risk of adverse events, or where participants may be especially vulnerable, the HREC may request the chief investigator to provide an outcomes report, including information on follow-up of participants.

Regards,



A/Professor Stephan Millett
Chair Human Research Ethics Committee

Appendix B: Basic Information Sheet For Telemental Health Research

Information Sheet For Clients

Project Coordinator: Daniel R. Stubbings (Ph. 9266 2559)
Project Supervisors: Dr. Clare Rees (Ph. 9266 3039)
Dr. Lynne Roberts (Ph. 9266 7183)

What Is The Research About?

Traditionally, therapists treat clients in the same room. However, many people do not have direct access to such services. Recent advances in computer technology have made it possible to see and hear someone who is not in the same room. This form of contact is called videoconferencing. Hence, the purpose of this research is to study how successful treatment is via this medium.

What Will Happen To Participants?

The first one or two sessions will be to determine a diagnosis. These sessions will be done by a therapist in person. Then, you will be randomly selected to receive treatment either in-person or via videoconference. Therapy done in-person will not be different from standard practice. If selected to receive treatment via videoconference you will not be in the same room as your therapist. When you arrive at the clinic you will be guided into a private room. In this room you will be able to hear and see your therapist via a computer. You will not need to know how to use the computer. All participants will be asked to complete several brief questionnaires. These questionnaires will be given to you when treatment begins and 12-weeks later, when treatment ends. Finally, these questionnaires will be sent to you by post (with a paid return envelope) 6-weeks after treatment has ended.

Further Information

See over for more details of the project.

Thank you for your time and interest in this research.

Project Coordinator: Daniel R. Stubbings

This study has been approved by the Curtin University Human Research Ethics Committee (Approval Number HR 97/2009). If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth, 6845 or by telephoning 9266 2784 or by emailing hrec@curtin.edu.au.

Appendix C: Additional Information Sheet For Telemental Health Research

Information Sheet For Clients: Additional Information

Project Coordinator: Daniel R. Stubbings (Ph. 9266 2559)
Project Supervisors: Dr. Clare Rees (Ph. 9266 3039)
Dr. Lynne Roberts (Ph. 9266 7183)

Study Aim

The aim of this research is to investigate how effective psychotherapy administered via videoconference is compared to psychotherapy administered in-person. Videoconferencing technology enables people who are not in the same location to interact in real-time and this is accomplished by using computers to transmit audio-visual information across a secure network. This research will be influential in determining the utility of videoconferencing technology for providing remote clinical psychology services in the future.

Procedure Involved

If you choose to take part in this study you will be randomly selected to receive treatment either in-person or via videoconference. If you are selected to receive psychotherapy in-person your experience will not differ from routine clinical practice. If chosen to receive psychotherapy via videoconference your first assessment session will be conducted in-person and all subsequent sessions will be conducted via videoconference, you will not be in the same room with the therapist. You will be asked to complete several short questionnaires before treatment, after treatment and then again 6-weeks following the final session.

Benefits

Psychotherapy is a scientifically validated method of treating psychological difficulties, particularly with regards to problematic anxious and depressive feelings. However, no guarantee can be given that treatment will be successful. Psychotherapeutic treatment is expected to last for 12 weeks and if treatment is unsuccessful you will be offered the option of attending additional therapy and/or being referred to a free external agency. By taking part in this research you will be providing a valuable contribution to scientific research in psychotherapy. Also, if you decide to take part in this study you will not be charged for the services.

Risks

If you are selected to receive treatment in-person the risk is identical to the risk associated with routine practice. Unfortunately, some aspects of psychotherapy, such as learning to overcome fears, can be a mildly distressing experience in the short-term. However, all such experiences will be monitored by the treating therapist and you will not be forced or coerced into anything you don't want to do. If you are selected to receive treatment via videoconference there is a risk that the psychotherapy provided might not be as effective as if provided in-person. However, no previous research, without exception, has indicated that psychotherapy via videoconference is less effective than when provided in-person. Nevertheless, at present there is insufficient research to assert that psychotherapy via videoconference is as effective as when provided in-person.

Your Rights

You may withdraw from this research without reason at any stage of the research. Withdrawal will not affect your rights or the responsibilities of the researcher. If you wish to withdraw from the study you can choose to continue treatment at the Curtin Psychology Clinic, minimum fees will apply, or you can be referred to a free external government agency. If you would like to continue treatment at the clinic but perceive that you may have difficulty paying the minimum fee then it may be possible to arrange a payment schedule suitable to your needs.

Confidentiality

All records will be kept confidential. You will be identified by number throughout the study and your name-number code will be stored separately in a computer file accessible only to the researcher. The transmission of videoconferencing data will be conducted via a secure network. All sessions are recorded and will only be viewed by the therapist and their relevant supervisor. Once the study is completed the videotapes will be wiped. The case files and questionnaire data will be kept for a period of 5 years, after which they will be destroyed. Published or unpublished data from the study will not contain any identifying details.

Further Information

You are encouraged to discuss any concerns about the research with the Project Coordinator or the Project Supervisors. They can be contacted on the numbers provided above. Alternatively, if you wish to speak to someone not directly involved with the research (for example, about the information you have received, the conduct of the study, your rights as a participant, or to lodge a complaint) you may contact the Curtin University Human Research Ethics Committee Secretariat on 9266 2784.

Thank you for your time and interest in this research.

Daniel R. Stubbings
Project Coordinator

This study has been approved by the Curtin University Human Research Ethics Committee (Approval Number HR 97/2009). If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth, 6845 or by telephoning 9266 2784 or by emailing hrec@curtin.edu.au.

Appendix D: Consent Form For Telemental Health Research

Consent Form

Project Coordinator: Daniel R. Stubbings (Ph. 9266 2559)
Project Supervisors: Dr. Clare Rees (Ph. 9266 3039)
Dr. Lynne Roberts (Ph. 9266 7183)

I, _____
agree to the procedures of this research as outlined to me. I have been given the opportunity to ask questions about this research and to discuss my concerns. I acknowledge that the nature and purpose of this research, as well as the possible risks and benefits, have been explained to my satisfaction.

I have read and received a copy of the Information Sheet and I understand that I will not be identified in any published material.

I understand that my involvement in this research is completely voluntary and that I may withdraw from the research at any stage without prejudice.

Signature

Date

This study has been approved by the Curtin University Human Research Ethics Committee (Approval Number HR 97/2009). If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth, 6845 or by telephoning 9266 2784 or by emailing hrec@curtin.edu.au.

Appendix E: Assumption Testing

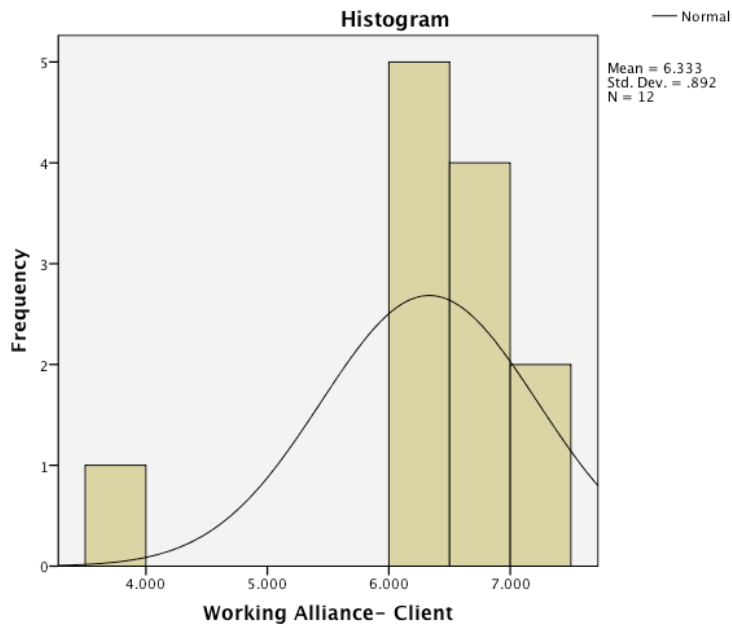


Figure 14. Working Alliance- client scores distribution in the videoconferencing condition

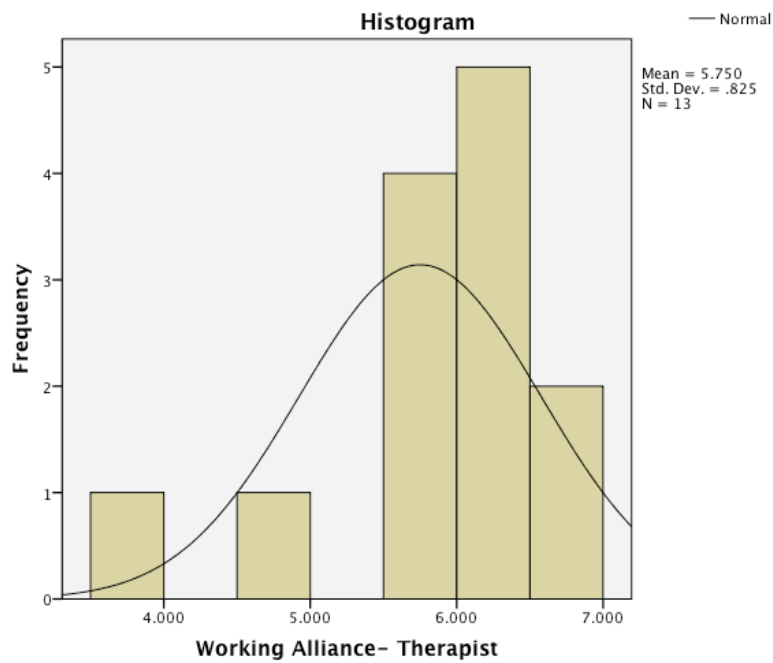


Figure 15. Working Alliance- therapist scores distribution in the videoconferencing condition

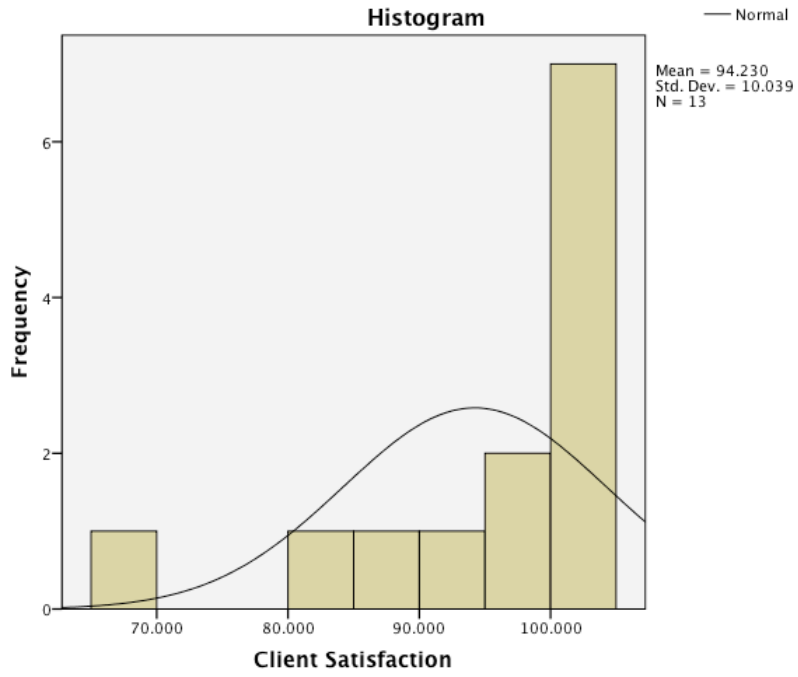


Figure 16. Client Satisfaction scores distribution in the videoconferencing condition

Appendix F: Anecdotal Findings & Therapist Reflections

Study two explored in detail how combined videoconference and text chat technology influenced one participant's therapeutic experiences. However, there were several anecdotal experiences with other participants who took part in study one that may be of clinical interest. Some of these experiences were similar to what was reported in study two and some were unique to that client-therapist interaction. These participant and therapist experiences are briefly described below.

Participant A

Participant A was young man with OCD who had obsessive intrusive thoughts about accidentally making a deal with the devil. The participant received minimal education, had poor short-term memory and had difficulty attending to long sentences. He was not able to directly say what the content of his intrusive thoughts were and his explanations of them were complicated, convoluted and difficult for both the participant and therapist to understand and remember. Therefore a decision was made to use the text-chat feature concurrently with the video interaction to make a log of the logic of his intrusive thoughts and to help the participant follow the thread of conversation. The approach appeared to help him remember what was being discussed and helped him to gain visual exposure to his intrusive thoughts.

As treatment progressed Participant A became able to say his intrusive thoughts aloud in the presence of the therapist via videoconference. However, the participant was unable to say the content of his intrusive thoughts when he was not in the therapist's presence. The participant had begun to believe that it was safe to assert the thoughts in the therapist's presence but not when he was alone. Therefore a stepping-stone exposure exercise was needed that was in-between saying the thoughts in the presence of the therapist and saying them alone. Interacting via telemental health technology made such an exposure exercise possible. The exposure task consisted of minimizing the video window so that the image of the therapist could not be seen, thus creating an environment where the participant was 'alone' in the room, but could still be monitored from the therapist's computer. The advantage of this is similar to moving out of frame (described in chapter five), it allowed the participant to feel like they were alone in the room but without compromising the therapist's vision of the participant. Thus it provides a graded exposure experience in-between the therapist presence and the therapists 'true' absence.

Participant B

Participant B was a young woman who was suffering from OCD and comorbid Narcissistic Personality Disorder. In the early stages of therapy she commented that she felt like she was being watched. However, as therapy progressed she said that she felt more relaxed and able to focus on the interaction. Combined text-video also helped her to communicate the content of her profane sexual intrusive thoughts, which she, like the participant in study two, went on to verbally discuss after she had mentioned them in text. Towards the latter stages of her treatment Participant B became able to cry openly via the telemental health technology. When a participant cries in-person it can be appropriate to hand the participant a tissue and lean forward in the chair, both of which aim to communicate a physical 'presence'. Via videoconference it is not possible to do either of these. Consequently, via videoconference the therapist may rely more on verbal empathy, for example "*if I was there in-person I would hand you a tissue*". Such adjustments for interaction via videoconference have also been noted by Simpson et al. (2005).

Participant C

Participant C was a middle-aged woman with chronic depression and an impulse control disorder not otherwise specified. She was the first participant to utilise thought diaries remotely via a Word document. Conducting the thought diaries via the technology was very much the same as conducting them in person but with the added benefit of being able to easily modify the content and provide multiple print outs of the content.

Participant D

Participant D was a man in his 50's who was also suffering from OCD. In the first session Participant D reported that he initially felt like he was talking to a computer screen but as the session went on that feeling faded and he was able to relate via the technology. Similar comments to this were made by several of the other participants in study one.

Participant E

Participant E was a young man with OCD who had intrusive thoughts of violently maiming people. This participant also had intrusive thoughts about the therapist but was unable to express what they were. The technique of the therapist moving out of screen was first used with this participant. This appeared to help him articulate the violent thoughts, which became a stepping-stone exposure task to being able to tell the therapist his thoughts directly. Although Participant D became able to express his intrusive thoughts he was unable to engage in direct eye contact while saying them. Eye contact via videoconference is typically not direct because the location of the participant's eyes on the therapist's screen is lower than the location of the camera. However, when the camera is integrated with the screen, as it is with an Apple iMac, then this difference between eye level and the camera is minimal. Consequently, Participant E was able to confront his fear that if he looked someone in the eyes and had a violent intrusive thought he might act on them. This experience, along with those reported by the participant in study two, indicate that eye contact work can be achieved via videoconference. However, not being in the room with this participant was both a benefit and a hindrance. The participant reported that he found it easier to disclose his thoughts because he had a reduced fear that he could actually act on them. But the participant also reported that being remote prevented him from being truly able to test if he would act on his thoughts. This participant's example highlights the need for clinicians working via videoconference to find creative ways of engaging participants and the need to have complementary in-person exposure experiences outside of the video therapy for some participants.

Additional Therapist Experiences

One benefit of interacting with clients via distance technology is that there is no risk of transmitting an illness between client and therapist. The therapist observed this once when sick with a cold but was not so unwell as to prevent attending clinical appointments. Appointments via videoconference were conducted and ameliorated any concerns about the therapist passing on his cold. Although this may seem like a trivial issue, it would be an extremely relevant issue if videoconferencing were used to provide crisis therapy to clients under infection control.

Another difference between in-person and videoconference-based interactions is the eye contact. In some cultures it is the person that speaks who looks

at the listener and it is the listener who provides intermittent eye contact whereas in other cultures it can be the opposite (Berko, Wolvin, & Wolvin, 2010). Via videoconference the eye contact is neither of these scenarios. Both the participant and therapist primarily stare directly at the image of each other projected on the monitor. Via the Apple iMac computers the eye contact is almost in line with the camera but not completely. In the research associated with this thesis, when the therapist wanted to project an image with 100% direct eye contact with the participant he focused his eyes at the camera instead of the participant's eyes projected via the monitor. Such adjustments to interpersonal interactions have also been noted by Simpson et al. (2005). Again, this issue may be a trivial one but it is worth noting because therapists and participants new to interacting via videoconference may need to learn to make such adjustments.