

Telehealth, Computer-, and Internet-based Approaches to Treating Depression and Anxiety

Rebecca E. Lubin
VA Boston Healthcare System
150 South Huntington Avenue
Boston, MA 02130
Rebecca.Lubin@va.gov
857-364-6190

Alexander H. Jordan
VA Boston Healthcare System
150 South Huntington Avenue
Boston, MA 02130
Alexander.Jordan@va.gov
857-364-6291

Jennifer H. Wortmann
VA Boston Healthcare System
150 South Huntington Ave.
Boston, MA 02130
Jennifer.Wortmann@va.gov
857-364-5837

Jonathan L. Larson
VA Boston Healthcare System
150 South Huntington Ave.
Boston, MA 02130
Jonathan.Larson@va.gov
857-364-5832

Brett T. Litz
VA Boston Healthcare System
150 South Huntington Ave.
Boston, MA 02130
Brett.Litz@va.gov
857-364-4131

Abstract

There is a great need for evidence-based treatments for depression and anxiety that are cost-effective, efficiently delivered, and highly accessible. Telehealth, computer, and Internet interventions are efficacious and have the potential to broaden access to treatment for depression and anxiety. These interventions are cost-effective and increase treatment accessibility for individuals who would otherwise be unlikely to receive appropriate care, and their anonymity reduces the stigma of help-seeking. This chapter discusses these treatment approaches, their efficacy, and their limitations.

Keywords: anxiety disorders, cognitive behavioral therapy, computer-based therapy, depression, Internet-based therapy, psychotherapy, telehealth, telephone therapy, treatment, virtual reality therapy

Over one quarter of Americans experience an anxiety disorder at some point in their lives, and approximately one in six experience major depression (Kessler et al. (2005)). However, only a minority of these individuals receive adequate treatment (Kessler et al. (2003)). Consequently, there is a great need for evidence-based treatments that are cost-effective, efficiently delivered, and highly accessible (Wang et al. (2005); Greenberg et al. (1999)). Telehealth, computer, and Internet interventions have the potential to redress stigma and to broaden access to treatment for depression and anxiety (Kessler et al. (2005); Wang et al. (2005)) and have largely been found to be efficacious (e.g., Spek et al. (2007)). In this chapter, we review these interventions and the evidence supporting their efficacy for depression and anxiety disorders, and we discuss advantages and disadvantages of these types of treatment.

Interventions

Although evidence-based mental health treatment has traditionally involved lengthy face-to-face sessions with a trained therapist, typically in a specialty care setting, the majority of telehealth, computer-, and Internet-based treatment approaches were developed based on the idea that individuals can effectively use self-management strategies and assisted self-help to overcome depression and anxiety. Over the past 30 years, these approaches have evolved from telephone crisis lines to Internet-based interventions that rely on instructional text or video. Some treatments have even started to incorporate advanced technologies such as virtual reality.

Telehealth Approaches

Telephones have long been used by individuals seeking help for mental health concerns. Forms of telephone crisis intervention, from call-in radio stations to suicide hotlines administered by trained paraprofessionals, have existed since the 1970s (Haas et al. (1996)).

Starting in the late 1980s, researchers began to study the efficacy of standardized treatments delivered over the phone by mental health professionals. In contrast to later telehealth, computerized, and Internet-based treatments, these telephone treatments were typically very similar in structure to face-to-face treatments. The majority of research on these interventions has focused on highly structured cognitive behavioral therapies (CBT) delivered by trained therapists over 8 to 10 hour-long sessions.

Telephone CBT (T-CBT) is an effective intervention for depression. As with face-to-face CBT for depression, the treatment begins with education about symptoms and the theory behind CBT, and then proceeds to monitoring of daily thoughts and challenging thought patterns that contribute to depression. A meta-analysis indicated that patients who received T-CBT showed a significantly greater reduction in depressive symptoms than did those in control conditions (Mohr et al. (2008)). Moreover, in at least one study, T-CBT showed more efficacy than other telephone-administered psychotherapies, such as supportive emotion-focused therapy, in reducing depressive symptoms, although the difference in treatment gains between these two therapies disappeared at 12-month follow-up (Mohr et al. (2005)). Few studies have directly compared T-CBT to face-to-face CBT; in one study that did so, the therapies produced comparable improvements in depression during the course of the therapy, although the face-to-face patients showed more retention of their gains at long-term follow-up (Mohr et al. (2012)).

Fewer studies have examined telephone therapy for anxiety disorders than for depression, but the existing research supports its efficacy. For example, an adaptation of T-CBT for posttraumatic stress disorder (PTSD) that included exposure therapy components and a workbook was superior to assessment-only in reducing PTSD and depression symptoms over time (DuHamel et al. (2010)). Telephone-administered behavioral therapy has also been found to

be efficacious for panic disorder with agoraphobia as well as obsessive-compulsive disorder (OCD; Swinson et al. (1995); Lovell et al. (2006)).

Interactive Voice Response (IVR) systems are a less common form of telehealth treatment that combines the use of telephones with a computer system. Patients call into a computer system, which gives self-help recommendations or plays therapy modules based on the information that a patient enters into a touch-tone phone (Newman et al. (2011); Osgood-Hynes et al. (1998)). Osgood-Hynes et al. (1998) found that an IVR system supplemented by printed booklets was efficacious in treating depression. Several studies have also shown that successful behavioral treatment of OCD can be conducted through an IVR system (Bachofen et al. (1999); Marks et al. (1998)).

Computer-based Approaches

Early forays into computer-based psychotherapies were essentially computer-based versions of conventional talk therapies. For example, in a study of computer-based CBT for depression, a text-based computer program educated the patient about the treatment, assessed symptoms, presented key concepts, and assigned reading and homework assignments dependent on the responses of the patient (Selmi et al. (1990)). Patients who received this treatment showed significant improvement in depression symptoms, comparable to patients who had received CBT from a human clinician and significantly greater than the improvement of the waiting-list control group. More recent computer-based therapies have moved beyond text alone and incorporated interactive multimedia, including video. Patients in one such study showed a significant reduction in depression and anxiety symptoms compared to a treatment-as-usual control group at post-treatment and 6-month follow-up (Proudfoot et al. (2003)).

Another study examined the use of a computer program in a primary care setting to both guide novice clinicians in administering CBT and to deliver components of the therapy to patients with panic disorder, PTSD, GAD, or SAD via text and video demonstrations (Craske et al. (2009)). This treatment effectively reduced symptoms across all diagnoses and, moreover, illustrated the applicability and efficacy of this type of specialized intervention in a primary care setting.

Research suggests that virtual reality exposure therapy (VRET) is an effective treatment for a number of anxiety disorders, including specific phobias, PTSD, social anxiety disorder, and agoraphobia (Krijn et al. (2004); Parsons and Rizzo (2008)). As in real-life exposure therapy, patients undergoing VRET are exposed to fear-inducing stimuli in an increasing hierarchy generated by the clinician and patient. During each session of exposure, patients rate their discomfort. As discomfort drops in response to one stimulus, patients proceed to a more anxiety-provoking stimulus in the hierarchy. As a substitute for real-life or imagined encounters with stimuli, VRET uses computer images and other sensory inputs to simulate an anxiety-inducing situation. VRET allows clinicians to simulate situations that are difficult to engage in real life (e.g., flying or combat) and is sometimes more acceptable for patients who hesitate to expose themselves to feared stimuli (Powers and Emmelkamp (2008)). Evidence suggests that VRET is more effective than imagined exposure and produces equivalent outcomes to real-life exposure for specific phobias (Emmelkamp (2003)).

Specific phobias have also been effectively targeted by vicarious exposure, in which an individual uses an avatar in a computer program to undergo graduated exposure to a feared stimulus. For example, the patient moves the on-screen avatar closer to the stimulus (Newman et

al. (2011); Gilroy et al. (2000)). Vicarious exposure has also been tested as a treatment for OCD, but it did not produce significant reductions in symptoms (Clark et al. (1998)).

Internet-based Approaches

Internet-based treatments offer several advantages over standard in-person treatments, even those that are computer-based (Spek et al. (2007)). Like telehealth interventions, Internet treatments are accessible for patients who may find professional therapists difficult to visit due to location, lack of transportation, or lack of time. The Internet also provides a degree of privacy for patients, thereby reducing the stigma of seeking mental health care (Gega et al. (2004)). Finally, Internet therapies afford patients greater control over their mental health care; they can log in for a session when and where they would like (Lange et al. (2003)). Internet interventions thus allow for greater treatment availability than ever before and are receiving increasing research attention.

Depression

Internet interventions enjoy strong support as an efficacious form of treatment for depression, especially when incorporating some form of therapist support. Several I-CBT interventions have resulted in significantly lower depressive symptoms compared to control groups (e.g., Christensen, Griffiths, and Jorm (2004); Clarke et al. (2005)), and two meta-analyses of Internet interventions for depression found Internet interventions and face-to-face interventions to be equally efficacious (Andersson and Cuijpers (2009); Barak et al. (2008)). Notably, Andersson and Cuijpers's (2009) meta-analysis did not find a difference in efficacy between I-CBT interventions and Internet treatments deriving from other therapeutic orientations, although they cautioned that few non-CBT Internet treatments were available for comparison. In addition, despite the strong general support for Internet-based treatment of

depression, one meta-analysis found that Internet therapies for depression had a smaller mean effect size than Internet therapies for anxiety (Spek et al. (2007)).

Anxiety Disorders

Internet-based therapies have been found to be an effective method for treating anxiety disorders. A meta-analysis of randomized controlled trials of Internet CBT (I-CBT) interventions for depression and anxiety indicated that I-CBT produced a large mean effect size for anxiety disorders (Spek et al. (2007)).

Many trials of Internet interventions for anxiety disorders have examined their use in treating social anxiety disorder (SAD), with results suggesting efficacy similar to in-person treatments (e.g., Andersson et al. (2006); Carlbring et al. (2007)). For example, Hedman et al. (2011) assigned patients diagnosed with SAD to either in-person group CBT or an I-CBT treatment with therapist support. The I-CBT included text instructing patients in treatment components such as exposure and thought challenging, as well as a homework component with individualized written feedback provided by a therapist over online messaging. Participants in both treatment arms showed large improvements in social anxiety symptoms at post-treatment, and outcomes for the I-CBT patients were superior to group CBT outcomes at follow-up.

Several studies have also shown Internet interventions to be effective for PTSD (e.g., Hirai and Clum (2005); Klein et al. (2010); Spence et al. (2011); Knaevelsrud and Maercker (2007)). For example, in a randomized controlled trial, Lange et al. (2003) tested a therapy that was administered over an interactive website and that asked participants to complete a series of structured writing assignments (e.g., confronting the traumatic memory by writing about it in detail). After completing each assignment, the participant received written feedback from a

therapist. Participants in the treatment condition showed significantly greater symptom improvement than did those in the waiting list control condition (Lange et al. (2003)). Further evidence supporting online PTSD interventions comes from a trial comparing I-CBT to Internet-based supportive counseling (Litz et al. (2007)). After an initial in-person session in which the therapist helped the patient establish a hierarchy of stressful situations and taught relaxation and thought-challenging techniques, the I-CBT treatment consisted of self-guided exposure to the stressful situations. Participants were also asked to repeatedly write narratives of their trauma memory while logged on to the website. Both treatment arms showed a symptom decline over the course of the treatment, but participants in the I-CBT group showed greater reductions in PTSD, depression, and anxiety symptoms after six months and more patients who achieved high functioning at follow-up, compared to those in the supportive counseling group (Litz et al., 2007).

Although controlled trials have been less numerous than for SAD and PTSD, I-CBT interventions have also shown efficacy in the treatment of panic disorder (Wims et al. (2010); Kiropoulos et al. (2008); Klein, Richards, and Austin (2006)), generalized anxiety disorder (Robinson et al. (2010); Titov et al. (2009)), and OCD (Andersson et al. (2012)). As with the I-CBT treatments for SAD and PTSD outlined above, online interventions for these other anxiety disorders have typically consisted of instruction on thought-challenging and other important treatment elements, assignments to practice exposure to anxiety-provoking stimuli, and written electronic communication between the patient and a therapist. More limited evidence supports the efficacy of Internet-based interventions for specific phobias. Andersson et al. (2009) compared an Internet-delivered self-help treatment for spider phobia with in-person exposure

therapy and found that the in-person therapy produced clinically significant change for a larger proportion of patients, but the difference between the conditions disappeared at follow-up.

Limitations

While telehealth, computer, and Internet approaches to treating depression and anxiety are largely effective, the inclusion of therapist support via in-person, telephone, or email contact in these interventions appears to be an important factor in producing strong effects (Spek et al. (2007); Andersson and Cuijpers (2009)). Attrition rates, which are already higher for these interventions than for in-person treatments, are especially impacted when there is no therapist involvement in the intervention (Newman et al. (2011)). However, more recently, Lintvedt et al. (2013) found that I-CBT intervention without therapist support – that is, with no in-person, email, or telephone contact – significantly reduced depressive symptoms and negative thoughts, with these reductions maintained at 2-months post-treatment, although the attrition rate was quite high.

Additionally, there is some concern that Internet interventions are not appropriate for all individuals and symptom severities. Internet interventions may be less effective for severe cases of depression than for cases that are mild-to-moderate (Moritz et al. (2013)). Moreover, evidence suggests that some populations are more likely to utilize Internet interventions than others. Compared to those engaged in traditional outpatient treatment for depression and anxiety, those who engaged in an Internet-based treatment for the same disorders have been found to be older, more likely to be female, and more likely to be married (Titov et al. (2010)). Individuals without computer literacy or sufficient resources may be unable to access Internet interventions at all, a

limitation that could lead these interventions to exacerbate existing health access problems for the elderly and those with low income or education (Murray (2012); Wang et al. (2005)).

Finally, some researchers have expressed concern over safety and privacy issues in telephone and Internet interventions. Due to the distal nature of such treatments, therapists are limited in their ability to pick up on nonverbal cues from the patient (Lange et al. (2003)) and unable to act immediately when a patient is in danger (Spek et al. (2007)). Internet treatment approaches may present privacy concerns as well; cyber security is thus an important concern to address in all Internet interventions (Murray (2012)).

Conclusion

Despite these limitations, telehealth, computer, and Internet approaches to treating depression and anxiety have shown efficacy and fulfill several important needs in mental health care. The anonymity of these interventions reduces the stigma of help seeking (Gega et al. (2004)), and this treatment modality is cost-effective and accessible to some individuals who would otherwise be unlikely to receive treatment (see McCrone et al. (2004)). While these interventions must be used thoughtfully, their benefits provide a strong case for further advancement in their use as treatments for depression and anxiety.

Cross References

1. Anxiety, Panic and phobias, 5. Disorders of Negative Affect, 12. Posttraumatic Stress Disorder, 17. Clinical Assessment, 18. Cognitive Behavioural Psychotherapy, 19. Community Mental Health and Primary Care, 23. Evidence-Based Practice (EBP), 24. Exposure Therapy, 34. Psychotherapy, 35. Tele-Psychology, 84. Depression, 90. Obsessive-Compulsive Disorder, 143. Psychotherapy Effectiveness, 196. Virtual Reality Therapy, 261. Group Psychotherapy, 266. Exposure therapy for anxiety disorders, 267. Exposure therapy for PTSD

References

Andersson, G., Waara, J., Jonsson, U., *et al.* (2009). Internet-based self-help versus one-session exposure in the treatment of spider phobia: A randomized controlled trial. *Cognitive Behaviour Therapy* **38**(2), 114-120.

Andersson, G., Carlbring, P., Holmström, A., *et al.* (2006). Internet-based self-help with therapist feedback and in vivo group exposure for social phobia: A randomized controlled trial. *Journal of Consulting and Clinical Psychology* **74**(4), 677-686.

Andersson, G. and Cuijpers, P. (2009). Internet-based and other computerized psychological treatments for adult depression: A meta-analysis. *Cognitive Behaviour Therapy* **38**(4), 196-205.

Andersson, E., Enander, J., Andréén, P., *et al.* (2012). Internet-based cognitive behavior therapy for obsessive-compulsive disorder: a randomized controlled trial. *Psychological Medicine* **42**, 2193-2203.

Barak, A., Hen, L., Boniel-Nissim, M. and Shapira, N. (2008). A comprehensive review and a meta-analysis of the effectiveness of Internet-based psychotherapeutic interventions. *Journal of Technology in Human Services* **26**(2/4), 109-154.

Bachofen, M., Nakagawa, A., Marks, I. M., *et al.* (1999). Home self-assessment and self-treatment of obsessive-compulsive disorder using a manual and a computer-conducted telephone interview: Replication of a U.K.-U.S. study. *Journal of Clinical Psychiatry* **60**(8), 545-549.

Carlbring, P., Gunnarsdottir, M., Hedensjö, L., *et al.* (2007). Treatment of social phobia: Randomised trial of internet-delivered cognitive-behavioural therapy with telephone support. *British Journal of Psychiatry* **190**, 123-128.

Christensen, H., Griffiths, K. M., and Jorm, A. F. (2004). Delivering interventions for depression by using the internet: randomized controlled trial. *BMJ*, 328.

Clark, A., Kirkby, K. C., Daniels, B. A. and Marks, I. M. (1998). A pilot study of computer-aided vicarious exposure for obsessive-compulsive disorder. *Australian & New Zealand Journal of Psychiatry* **32**(2), 268-275.

Clarke, G., Eubanks, D., Reid, E., *et al.* (2005). Overcoming depression on the Internet (ODIN) (2): A randomized trial of self-help depression skills program with reminders. *Journal of Medical Internet Research* **7**(2), e16.

Craske, M. G., Rose, R. D., Lang, A., *et al.* (2009). Computer-assisted delivery of cognitive behavioral therapy for anxiety disorders in primary-care settings. *Depression and Anxiety* **26**, 235-242.

DuHamel, K. N., Mosher, C. E., Winkel, G., *et al.* (2007). Randomized clinical trial of telephone-administered cognitive-behavioral therapy to reduce post-traumatic stress disorder and distress symptoms after hematopoietic stem-cell transplantation. *Journal of Clinical Oncology* **28**(23), 3754-3761.

Gega, L., Marks, I. and Mataix-Cols, D. (2004). Computer-aided CBT self-help for anxiety and depressive disorders: Experience of a London clinic and future directions. *Journal of Clinical Psychology: In Session* **60**(2), 147-157.

Gilroy, L. J., Kirkny, K. C., Daniels, B. A., Menzies, R. G. and Montgomery, I. M. (2000). Controlled comparison of computer-aided vicarious exposure versus live exposure in the treatment of spider phobia. *Behavior Therapy* **31**(4), 733-744.

Greenberg, P. E., Sisitsky, T., Kessler, R. C., *et al.* (1999). The economic burden of anxiety disorders in the 1990s. *Journal of Clinical Psychiatry* **60**(7), 427-435.

Haas, L. J., Benedict, J. G. and Kobos, J. C. (1996). Psychotherapy by telephone: Risks and benefits for psychologists and consumers. *Professional Psychology: Research and Practice* **27**(2), 154-160.

Hedman, E., Andersson, G., Ljótsson, B., *et al.* (2011). Internet-based cognitive behavior therapy vs. cognitive behavioral group therapy for social anxiety disorder: A randomized controlled non-inferiority trial. *PloS ONE* **6**(3), e18001.

Hirai, M. and Clum, G. A. (2005). An Internet-based self-change program for traumatic event related fear, distress, and maladaptive coping. *Journal of Traumatic Stress* **18**(6), 631-636.

Kessler, R. C., Berglund, P., Demler, O., *et al.* (2003). The epidemiology of major depressive disorder: Results from the National Comorbidity Survey Replication (NCS-R). *Journal of the American Medical Association* **289**(23), 3095-3105.

Kessler, R. C., Berglund, P., Demler, O., *et al.* (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry* **62**(6), 593-602.

Kiropoulos, L. A., Klein, B., Austin, D. W., *et al.* (2008). Is internet-based CBT for panic disorder and agoraphobia as effective as face-to-face CBT? *Journal of Anxiety Disorders* **22**(8), 1273-1284.

Klein, B., Mitchell, J., Abbot, J., *et al.* (2010). A therapist-assisted cognitive behavior therapy internet intervention for posttraumatic stress disorder: Pre-, post- and 3-month follow-up results from an open trial. *Journal of Anxiety Disorders* **24**(6), 635-644.

Klein, B., Richards, J. C. and Austin, D. W. (2006). Efficacy of internet therapy for panic disorder. *Journal of Behavior Therapy and Experimental Psychiatry* **37**(3), 213-238.

Knaevelsrud, C. and Maercker, A. (2007). Internet-based treatment for PTSD reduces distress and facilitates the development of a strong therapeutic alliance: A randomized controlled clinical trial. *BMC Psychiatry* **7**, 13.

Krijn, M., Emmelkamp, P. M. G., Olafsson, R. P. and Biemond, R. (2004). Virtual reality exposure therapy of anxiety disorders: A review. *Clinical Psychology Review* **24**(3), 259-281.

Lange, A., Rietdijk, D., Hudcovicova, M., *et al.* (2003). Interapy: A controlled randomized trial of the standardized treatment of posttraumatic stress through the Internet. *Journal of Consulting and Clinical Psychology* **71**(5), 901-909.

Lintvedt, O. K., Griffiths, K. M., Sørensen, K., *et al.* (2013). Evaluating the effectiveness and efficacy of unguided internet-based self-help intervention for the prevention of depression: a randomized controlled trial. *Clinical Psychology and Psychotherapy* **20**, 10-27.

Litz, B. T., Engel, C. C., Bryant, R. A. and Papa, A. (2007). A randomized, controlled proof-of-concept trial of an Internet-based, therapist-assisted self-management treatment for posttraumatic stress disorder. *American Journal of Psychiatry* **164**(11), 1676-1684.

Lovell, K., Cox, D., Haddock, G., *et al.* (2006). Telephone administered cognitive behavior therapy for treatment of obsessive compulsive disorder: randomized controlled non-inferiority trial. *BMJ* **333**, 883.

Marks, I. M., Baer, L., Greist, J. H, *et al.* (1998). Home self-assessment of obsessive-compulsive disorder. Use of a manual and a computer-conducted telephone interview: two UK-US studies. *British Journal of Psychiatry* **172**, 406-412.

McCrone, P., Knapp, M., Proudfoot, J., *et al.* (2004). Cost-effectiveness of computerized cognitive-behavioural therapy for anxiety and depression in primary care: randomized controlled trial. *British Journal of Psychiatry* **185**, 55-62.

Mohr, D. C., Hart, S. L., Julian, L., *et al.* (2005). Telephone-administered psychotherapy for depression. *Archives of General Psychiatry* **62**, 1007-1014.

Mohr, D. C., Vella, L., Hart, S., Heckman, T. and Simon, G. (2008). The effect of telephone-administered psychotherapy on symptoms of depression and attrition: A meta-analysis. *Clinical Psychology: Science and Practice* **15**, 243-253.

Mohr, D. C., Ho, J., Duffecy, J., *et al.* (2012). Effect of telephone-administered vs face-to-face cognitive behavioral therapy on adherence to therapy and depression outcomes among primary care patients: A randomized trial. *Journal of the American Medical Association* **307**(21), 2278-2285.

Moritz, S., Schröder, J., Meyer, B., and Hauschildt, M. (2013). The more it is needed, the less it is wanted: Attitudes toward face-to-face intervention among depressed patients undergoing online treatment. *Depression and Anxiety* **30**, 157-167.

Murray, E. (2012). Web-based interventions for behavior change and self-management: Potential, pitfalls, progress. *Medicine 2.0* **1**(2), e3.

Newman, M. G., Szkodny, L. E., Llera, S. J. and Przeworski, A. (2011). A review of technology-assisted self-help and minimal contact therapies for anxiety and depression: Is human contact necessary for therapeutic efficacy? *Clinical Psychology Review* **31**, 89-10.

Osgood-Hynes, D. J., Greist, J. H., Marks, I. M., *et al.* (1998). Self-administered psychotherapy for depression using a telephone-accessed computer system plus booklets: An open U.S.-U.K. study. *Journal of Clinical Psychiatry* **59**(7), 358-365.

Parsons, T. D. and Rizzo, A. A. (2008). Affective outcomes of virtual reality exposure therapy for anxiety and specific phobias: A meta-analysis. *Journal of Behavior Therapy and Experimental Psychiatry* **39**(3), 250-261.

Powers, M. B. and Emmelkamp, P. M. G. (2008). Virtual reality exposure therapy for anxiety disorders: A meta-analysis. *Journal of Anxiety Disorders* **22**, 561-569.

Proudfoot, J., Goldberg, D., Mann, A., *et al.* (2003). Computerized, interactive, multimedia cognitive-behavioural program for anxiety and depression in general practice. *Psychological Medicine* **33**, 217-227.

Robinson, E., Titov, N., Andrews, G., *et al.* (2010). Internet treatment for generalized anxiety disorder: A randomized controlled trial comparing clinician vs. technician assistance. *PLoS ONE* **5**(6), e10942.

Selmi, P. M., Klein, M. H., Greist, J. H., Sorrell, S. P. and Erdman, H. P. (1990). Computer-administered cognitive-behavioral therapy for depression. *American Journal of Psychiatry* **147**(1), 51-56.

Spek, V., Cuijpers, P., Nyklicek, I., *et al.* (2006). Internet-based cognitive behaviour therapy for symptoms of depression and anxiety: a meta-analysis. *Psychological Medicine* **37**, 319-328.

Spence, J., Titov, N., Dear, B. F., *et al.* (2011). Randomized controlled trial of Internet-delivered cognitive behavioral therapy for posttraumatic stress disorder. *Depression and Anxiety* **28**(7), 541-550.

Swinson, R. P., Fergus, K. D., Cox, B. J. and Wickwire, K. (1995). Efficacy of telephone-administered behavioral therapy for panic disorder with agoraphobia. *Behaviour Research and Therapy* **33**(4), 465-469.

Titov, N., Andrews, G., Kemp, A. and Robinson, E. (2010). Characteristics of adults with anxiety or depression treated at an Internet clinic: Comparison with a national survey and an outpatient clinic. *PLoS ONE* **5**(5): e10885.

Titov, N., Andrews, G., Robinson, E., *et al.* (2009). Clinician-assisted Internet-based treatment is effective for generalized anxiety disorder: Randomized controlled trial. *Australian & New Zealand Journal of Psychiatry* **43**(10), 905-912.

Wang, P. S., Lane, M., Olfson, M., *et al.* (2005). Twelve-month use of mental health services in the United States: Results from the National Comorbidity Survey Replication. *Archives of General Psychiatry* **62**(6), 629-640.

Wims, W., Titov, N., Andrews, G. and Choi, I. (2010). Clinician-assisted Internet-based treatment is effective for panic: A randomized controlled trial. *Australian & New Zealand Journal of Psychiatry* **44**, 599-607.