The Climate Panic program of Internet-based treatment for panic disorder: A pilot study

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Abstract

The present paper reports the results of an open pilot trial of an Internet based clinician-assisted computerized cognitive behavioural treatment (CaCCBT) program for panic disorder. Ten participants meeting DSM-IV criteria for Panic Disorder with Agoraphobia were recruited. Over 9 weeks, participants completed 6 on-line lessons and homework assignments, received emails from a therapist, and contributed to an online discussion forum with other participants. Paired sample *t*-tests and effect sizes (Cohen's *d*) were calculated using an intention-to-treat design. Eighty percent of participants completed the 6 lessons. Medium to large pre- to post-treatment effect sizes were obtained on questionnaires measuring anticipatory and catastrophic thoughts, physical sensations associated with anxiety, agoraphobic avoidance, and depression. Seventy percent of participants did not meet criteria for panic disorder with agoraphobia at post-treatment. Mean therapist time spent per patient over the duration of the program was 206 minutes. These results are consistent with previous literature indicating that Internet-based treatment programs for panic disorder combined with individual and forum based therapist guidance can result in clinically significant improvements in outcomes for patients.

Keywords: Clinician assisted computerized cognitive behavioural therapy; panic disorder; treatment; Internet

Panic disorder (with or without agoraphobia) is a common mental disorder with 12 month prevalence in Australia of approximately 3.5% (Andrews, Henderson, & Hall, 2001) and is associated with considerable disability (Massion, Warshaw, & Keller, 1993). Panic disorder can be treated effectively with cognitive behavioural therapy (CBT) (Barlow, Ellard, Hainsworth, Jones, & Fisher, 2005; Butler, Chapman, Forman, & Beck, 2006; Otto, Smits, and Reese, 2004), however, in Australia only approximately 39% of people with panic disorder report seeking treatment in the preceding 12 months (Sanderson, Andrews, Corry, & Lapsley, 2003). Barriers to treatment seeking for panic disorder include the avoidance associated with the agoraphobia that is often present, as well as reasons common to low treatment seeking for other common mental disorders including barriers associated with geographical location, the lack of trained therapists, the potential expense of treatment, and lack of awareness about treatment options and effectiveness (Proudfoot, 2004; Titov, 2007).

One potential strategy for increasing the capacity of existing mental health services to treat panic disorder is to employ computers and Internet technology to assist in the administration of CBT, so called computerized CBT, or CCBT (Andrews & Titov, 2007; Titov, 2007) or computer-aided psychotherapy (CP) (Marks, Cavanagh, & Gega, 2007). A growing body of research indicates that CCBT programs, when combined with clinician assistance, can be effective in significantly reducing symptoms of many common mental disorders including depression (Andersson, Bergstrom, Hollandare, Carlbring, Kaldo, & Ekselius, 2005; Perini, Titov, & Andrews, submitted; Proudfoot, Goldberg, Mann, Everitt, Marks, & Gray, 2003), social phobia (Andersson, Carlbring, Holmstrom, Sparthan, Furmark, Nilsson-Ihrfelt, Buhrman, & Ekselius 2006; Carlbring, Gunnarsdóttir, Hedensjö, Andersson, & Ekselius 2007; Titov, Andrews, Choi, Schwencke, & Mahoney, 2008a; Titov, Andrews, Johnston, Schwencke, & Choi, in press; Titov, Andrews, & Schwencke, 2008b; Titov, Andrews, Schwencke, Drobny, & Einstein, 2008c), and panic disorder (Carlbring, Nilsson-Ihrfelt, Waara, Kollenstam, Buhrman, Kaldo, Söderberg, Ekselius, & Andersson 2005; Kiropoulos, Klein, Austin, Gilson, Pier, Mitchell, & Ciechomski, 2008; Klein, Richards, & Austin, 2006). Furthermore, randomized controlled

trials comparing Internet-based clinician-assisted CCBT (or CaCCBT) programs for panic disorder with face-to-face CBT programs have consistently demonstrated similar clinical outcomes between these two modes of administration (Carlbring et al., 2005; Kiropoulos et al., 2008; Schneider, Mataix-Cols, Marks, & Bachofen, 2005; Shandley, Austin, Klein, Pier, Schattner, Pierce, & Wade, 2008). Self-guided CCBT programs for panic disorder (Farvolden, Denisoff, Selby, Bagby, & Rudy, 2005; Klein, Shandley, Austin, & Nordin, submitted) have also resulted in statistically significant reductions in symptoms. However, consistent with the expectation that clinical support is required to treat panic disorder the effects sizes from CCBT for panic disorder are smaller than for CaCCBT programs.

While the results of CaCCBT and CCBT programs for treating common mental disorders such as panic disorder are encouraging, the use of such programs, while increasing, is not common in clinical practice. Successful implementation in standard clinical practice will depend on several factors including the replication of positive results from clinical efficacy and effectiveness trials, the cost effectiveness of such programs, and acceptability to clinicians and patients. Another issue likely to affect implementation involves the reliability of various versions of CaCCBT programs for similar disorders. Studies exploring the reliability of various versions of CaCCBT programs will help to determine the parameters and characteristics required for effective, reliable, and acceptable programs and their delivery.

The present study aimed to explore the efficacy of a new CaCCBT Internet-based program for the treatment of panic disorder in a small, open design, trial with 10 participants with a diagnosis of panic disorder with agoraphobia. The present study is part of a larger program examining the potential for providing education and treatment programs via the Internet for people with common mental disorders (www.climate.tv). Using a similar methodology, we have recently reported encouraging results for an Internet based treatment program for depression (Perini et al., submitted) and social phobia (Titov et al., 2008a; Titov et al., 2008b; Titov et al., 2008c; Titov, Andrews, Johnston, Schwencke, & Choi, in press). It was hypothesised that participants in the present study would show significant improvements on measures of symptoms of panic disorder and agoraphobia, and that the frequency of panic attacks would significantly decrease following treatment.

Method

Recruitment

Participants were recruited via a website designed for the overall research program (www.climateclinic.tv). This website provides information about common mental disorders, including panic disorder, and a link to apply online to join a research program. The first stage of the recruitment process involved participants completing questionnaires online to determine that they: (i) Were a resident of Australia; (ii) were at least 18 years of age, (iii) had access to a computer, the Internet, and use of a printer; (iv) were not currently participating in CBT; (v) were not using illicit drugs or consuming more than three standard drinks/day; (vi) were not currently experiencing a psychotic mental illness or severe symptoms of depression (defined as a total score > 23 or responding > 2 to Question 9 (suicidal ideation) on the Patient Health Questionnaire-Nine Item (PHQ-9) (Kroenke, Spitzer, & Williams, 2001); and (vii) if taking medication, had been taking the same dose for at least 1 month and did not intend to change that dose during the course of the program. Applicants who did not meet one or more of these criteria were immediately informed via an on-screen message and were sent an email thanking them for their application, regretting that they did not meet the inclusion criteria and encouraging them to discuss their symptoms with their primary care physician.

Participants who met the inclusion criteria then completed the following screening questionnaires online: The Social Phobia Screening Questionnaire (SPSQ) (Furmark, Tillfors, Everz, Marteinsdottir, Gefvert, & Fredrikson, 1999); the Generalized Anxiety Disorder – 7 Scale (GAD-7) (Spitzer, Kroenke, Williams, & Löwe, 2006), and several questions about the frequency and severity of their panic attacks. Applicants also completed a 25-item questionnaire about demographic details and treatment history.

Of the 16 people who applied to take part in the Panic program trial, 3 did not meet the inclusion criteria described above. The 13 remaining applicants were telephoned by the primary author (EW) who supplied more details about the program, and administered the Mini International Neuropsychiatric Interview Version 5.0.0 (MINI) (Sheehan, Lecrubier, Sheehan, Amorim, Janavs, Weiller, Hergueta, Baker, & Dunbar, 1998) to determine whether they met DSM-IV (American Psychiatric Association, 2000) diagnostic criteria for panic disorder (with or without agoraphobia). Three applicants did not meet diagnostic criteria for panic disorder (with or without agoraphobia) and were excluded from this study and advised about more appropriate treatment options. One of these applicants was also excluded because of concurrent CBT. The ten participants who met criteria for panic disorder were then administered the Panic Disorder Severity Scale (PDSS) (Shear, Brown, Sholomskas, Barlow, Gorman, Woods, & Cloitre, 1992), a 7-item clinician administered measure of the severity of panic disorder.

The study was approved by the Human Research Ethics Committee (HREC) of St Vincent's Hospital

(Sydney, Australia) and the HREC of the University of New South Wales (Sydney, Australia).

Participants

Ten people (6 female; 4 male), all meeting DSM-IV criteria for panic disorder with agoraphobia, met all inclusion criteria and agreed to participate in the trial. The mean age was 43.90 years (*SD* = 7.77), 70% reported being married or in a de facto relationship, and 30% reported they were single. Fifty percent were in full time employment, 40% were in part-time employment, and 10% (1) was an at home parent. Seventy percent of participants reported having previously talked to a health professional about mental health problems, and 40% reported currently taking medication for depression or symptoms of panic. Participants reported using the Internet for an average of 15.72 hours per week (SD = 11.16), with a range from 4 to 40 hours. Ninety percent of participants reported that they were either *confident* or *very confident* using computers and the Internet.

Outcome Measures

One week prior to beginning the trial, participants were asked to complete the following questionnaires administered online: The Mobility Inventory for Agoraphobia (MI) (Chambless , Caputo, Jasin, Gracely, & Williams, 1985), a modified version of the Agoraphobic Cognitions Questionnaire (ACQ) (Chambless, Caputo, Bright, & Gallagher, 1984), the Body Sensations Questionnaire (BSQ) (Chambless et al., 1984), and the Patient Health Questionnaire – 9 Item (PHQ-9) (Kroenke et al., 2001). Participants were also asked to estimate the number of panic attacks experienced over the past 7 days. All of these measures are considered valid and reliable to assess people with panic disorder with agoraphobia. The BSQ is a 17-item questionnaire that measures physical sensations, while the MI is a 26-item questionnaire with one optional question, measuring severity of symptoms of agoraphobia in two parts: Firstly participants rate avoidance when alone (MI-Alone) and, secondly, they rate avoidance when accompanied by a trusted person (MI-Accompanied). The ACQ measures cognitions frequently reported in agoraphobia. The version of the ACQ employed in the present study comprises the original 14 questions and 4 additional questions designed to derive more clinical details about symptoms. However, only scores from the 14 items of the original ACQ were included in analyses. The PHQ-9 is a valid and reliable measure of symptoms and severity of depression.

Changes in the PDSS, MI, ACQ, BSQ and frequency of panic attacks were considered the primary outcome measures, while changes in the PHQ-9 was a secondary measure. In addition to completing these questionnaires at pre- and post-treatment, participants were asked to also complete all questionnaires prior to the commencement of each lesson.

Treatment Program

The Panic program consists of four components: six online lessons, six homework assignments, participation in an online discussion forum, and regular email contact with a mental health clinician. Five of the online lessons were written by GA and based on the manual in Andrews, Creamer, Crino, Hunt, Lampe, and Page (2003), while EW wrote the lesson on cognitive therapy and modified the content of the other lessons. The contents of the lessons are consistent with best practice principles and techniques typically used in CBT programs for panic disorder (with or without agoraphobia). Part of the content of each lesson is presented in the form of an illustrated story about a young woman with panic disorder who, with the help of a therapist, learns to gain mastery over her symptoms. Principles and techniques of CBT described in the Climate Panic program include psychoeducation, hyperventilation control, cognitive restructuring, and behavioural experiments/exposure. Each lesson begins with a summary of the material described in the previous lesson. Each lesson also includes a printable summary and homework assignment. Participants were expected to complete the homework tasks prior to completing the next lesson. Participants were also expected to regularly post messages and homework assignments on a secure and confidential online discussion forum, using an alias. The forum software was phpBB 3.0.1.

One therapist (EW) moderated the forum and aimed to respond to postings within 24 hours. Participants were emailed by the therapist on an as-needs basis to either offer clinical advice or respond to a technical enquiry. The themes of the therapist's emails varied from reinforcement for continued participation and efforts, encouragement to practice the relevant treatment skills, encouragement to complete lessons and homework assignments, and enquiries about progress.

Treatment Procedure

The treatment program operated for 9 weeks and all participants began the Panic program at the same time. Participants were advised to complete the first two lessons within the first two weeks, then to complete the remaining 4 lessons on approximately a fortnightly basis, and to complete the six lessons within 9 weeks of starting. Feedback on questions was generally provided within 24 hours, and reminder emails were sent if necessary. Participants who had not logged into the program for 2 weeks and had not returned emails were telephoned by the therapist.

Therapist

One psychiatry registrar (EW) provided the clinical contact with participants. A research assistant provided administrative support to collate data. The duration of each contact with participants was recorded.

Statistical Analyses

Changes in outcome measures were evaluated using paired samples *t*-tests. All dependent variables except the post-treatment MI-Alone score were normally distributed. Effect sizes (Cohen's *d*) were calculated for all dependent measures, based on the pooled standard deviation of pre- and post-treatment scores. All analyses involved an intention-to-treat design.

Results

Attrition

Eight (80%) participants completed all six lessons within the required timeframe. Two (20%) participants withdrew from the program during treatment: One reported starting face-to-face treatment and withdrew after completing 3 lessons, while one was not able to be contacted, but completed 5 lessons. Post-treatment data across all outcome measures was obtained from 7/10 participants. Consistent with the intention-to-treat paradigm, the last available scores from the 3 participants who did not complete the post-treatment questionnaires were carried forward as their post-treatment scores. Post-treatment telephone interviews to administer the PDSS were conducted with 8/10 participants, with pre-treatment scores from the 2 participants who were not able to be interviewed at post-treatment carried forward.

Results of Outcome Measures

Paired sample *t*-tests (Table 1) revealed statistically significant improvements across all outcome measures (PDSS, ACQ, MI-Alone, MI-Accompanied, BSQ, PHQ-9, and frequency of panic attacks). Large effect sizes were found for the PDSS (1.65), ACQ (1.12), BSQ (1.26), and PHQ-9 (1.57). Moderate effect sizes were found on the MI-Alone (0.66) and MI-Accompanied (0.70).

Clinical Outcomes

At pre-treatment all participants met diagnostic criteria for panic disorder with agoraphobia. At post-treatment, as indicated by frequency of panic attacks in the past month, 30% (using the intention-to-treat paradigm) met diagnostic criteria for panic disorder with agoraphobia. Of the completers, at post-treatment only 1 met criteria for panic disorder. Significant changes were also observed in frequency of panic attacks. At pre-treatment all participants reported at least one panic attack in the previous 7-day period (mean = 2.45, *SD* = 1.42). At post-treatment, the mean number of panic attacks reported in the previous 7 days was 0.60 (*SD* = 1.07), with 7 participants reporting they had been panic free for the previous 7 days.

Time/Contact Events Per Participant

Including monitoring of the discussion forum and providing forum and email feedback, the average therapist time per participant was 206 min. An additional average 60 min per patient was required for administrative purposes, and the diagnostic telephone interview and administration of the PDSS required an additional 60 minutes. Over the duration of the treatment program a total of 75 emails were sent to participants (mean = 7.5, SD = 2.17), with a mean of 3.6 forum postings per patient, including those to the entire group. Participants posted a total of 187 posts to the forum (mean = 18.7, SD = 17.6).

Table 1
Results of Outcome Measures

Measure	Pre-Treatment *M*	Pre-Treatment *SD*	Post-Treatment *M*	Post-Treatment *SD*	Effect Size (Cohen's d)
Panic Disorder Severity Scale (PDSS)	15.70[b]	3.43	8.80[b]	4.80	1.65
Full panic attacks (last 7 days)	2.45[b]	1.42	0.60[b]	1.07	1.47
Agoraphobic Cognitions Questionnaire (ACQ)	35.30[b]	8.34	25.40[b]	9.35	1.12
Body Sensation Questionnaire (BSQ)	50.30[a]	16.74	32.80[a]	10.32	1.26
Mobility Inventory – Alone (MI)	54.90[b]	20.65	42.50[b]	16.97	0.66
Mobility Inventory – Accompanied (MI)	78.80[b]	28.65	60.00[b]	24.86	0.70
Patient Health Questionnaire – 9 Item (PHQ-9)	11.20[b]	5.29	4.30[b]	3.27	1.57

Table Note: Similar superscripts indicate means are significantly different (paired samples *t*-tests): a: $p < .05$. b: $p < .01$.

Discussion

The present study explored the clinical efficacy of an Internet-based CaCCBT treatment program for panic disorder using an open trial design with 10 participants. At pre-treatment all participants met diagnostic criteria for panic disorder with agoraphobia. Eight (80%) completed the six lessons in the required time, and post-treatment data was collected from 7 (70%) participants.

The first hypothesis, that participants would experience significant improvements on measures of symptoms of panic disorder and agoraphobia, was supported. Using an intention-to-treat model, statistically significant improvements were observed from pre- to post-treatment across symptoms of agoraphobic cognitions (ACQ), physical sensations (BSQ), and severity of agoraphobia, when alone (MI-Alone) and when accompanied (MI-Accompanied). These changes were reflected in large effect sizes on the ACQ and BSQ, of 1.12 and 1.26, respectively. Moderate effect sizes were found for the severity of agoraphobia when alone (MI-Alone = 0.66), and when accompanied (MI-Accompanied = 0.70). Significant pre- to post-treatment improvements were also observed on the PHQ-9, the secondary outcome measure. The large effect size (1.57) indicates that the treatment program also resulted in considerable improvements in mood.

The second hypothesis, that treatment would be associated with a reduction in frequency of episodes of panic attacks, was also supported. At pre-treatment all participants reported at least one panic attack in the previous two-week period but this number reduced to 30% of participants at post-treatment. This is consistent with the pattern of improvements observed from the other questionnaires. Furthermore, the number of participants meeting diagnostic criteria for panic disorder with agoraphobia reduced from 100% at pre-treatment to 30% at post-treatment.

These preliminary findings, while encouraging, are consistent with those reported in other CaCCBT programs for panic disorder. For example, the magnitude of the effect sizes on the measures of symptom of panic disorder and agoraphobia reported here (BSQ, ACQ, MI-alone, MI-Accompanied) are comparable to those reported by Carlbring et al. (2005). Furthermore, the amount of therapist time per participant in the present study was the same, if not less than the time usually required in face-to-face treatment, again, consistent with the results of previously reported Internet-based CaCCBT programs for panic disorder (Carlbring et al., 2005; Kiropoulous et al., 2008; Klein et al., 2006). Importantly, the pre-treatment severity of participants in the present study was comparable to those reported by similar research that has compared CaCCBT with face-to-face treatment (Carlbring et al., 2005; Kiropoulous et al., 2008), indicating that the treatment procedure reported here may also compare favourably in head-to-head studies of CaCCBT and face-to-face treatment.

These results also provide further, although preliminary, evidence that Internet-based CaCCBT programs for panic disorder can be successfully developed independently of established programs. This is perhaps not unexpected, given that strict adherence to standard treatment principles and an experienced clinician were involved.

Limitations

The generalisability of these results is limited by the absence of a control group and absence of a follow-up assessment. These issues will be addressed in a forthcoming randomised control trial (RCT) comparing a waitlist control condition with a treatment group, with follow-up at 6-months post-treatment. Data about the acceptability of the program was not collected in the present study, although qualitative reports from participants indicated that most found the treatment program generally acceptable. Questionnaires enquiring about treatment acceptability and satisfaction will be administered in that forthcoming RCT.

In conclusion, these preliminary, but encouraging results indicate that the Panic program was successful at reducing symptoms of panic disorder and agoraphobia at levels comparable to face-to-face treatment and other CaCCBT programs. If this finding is confirmed in forthcoming RCTs, a next step will be to explore, in detail, the parameters and characteristics of the different CaCCBT programs for panic disorder and other common mental disorders. This will help determine the characteristics required for effective, reliable, and acceptable programs and their delivery.

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Research Profile

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