AN EMPIRICAL TEST OF CALM FOR PD:
A COMPUTER-ADMINISTERED LEARNING MODULE FOR PANIC DISORDER

DISSERTATION

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ABSTRACT

While cognitive behavioral interventions have been effectively used to treat panic disorder for the last 20 years, this type of therapy still remains inaccessible to the majority of potential patients due to lack of availability and high cost. Alternative treatment modalities such as remotely delivered therapy, brief therapy and bibliotherapy have been explored as potential alternatives yet effective treatment is still out of reach for the average person with a panic disorder diagnosis. The present study is a pilot test of the first, multimodal, computer-based treatment for panic disorder. Participants with a primary diagnosis of panic disorder with or without agoraphobia (N=22) were matched on overall symptom severity and severity of agoraphobic symptoms. Matched participants were randomly assigned to receive immediate treatment or a delayed treatment control. Interview and self-report measures of symptoms were collected pre- and post-intervention. The findings suggest that CALM may provide a highly effective, inexpensive and accessible treatment for patients with panic disorder. Conclusions about the future applicability of this new intervention as well as a discussion of problems with external validity due to differential rates of attrition are presented.
This project is dedicated to Matt, Brad and my parents. Without these four people, none of the best things in my life would have been possible.
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# TABLE OF CONTENTS

Abstract ................................................................................................................. ii  
Dedication ............................................................................................................... iii 
Acknowledgements ............................................................................................... iv  
Vita......................................................................................................................... v  

## Chapters:

1. Introduction ...................................................................................................... 1  
   1.1 Cognitive-behavioral Treatment of PD .......................................................... 2  
      1.1.1 Efficacy of CBT Interventions ............................................................... 2  
      1.1.2 Availability and Cost-effectiveness of CBT for PD .............................. 5  
      1.1.3 Alternative Treatment Modalities ......................................................... 7  
         1.1.3.1 Remote Therapy .............................................................................. 7  
         1.1.3.2 Brief Interventions ........................................................................ 10  
      1.1.4 Bibliotherapy ...................................................................................... 14  
      1.1.5 Summary ........................................................................................... 24  
   1.2 Computer-administered Treatments for PD ................................................. 24  
      1.2.1 Adjunctive Computer Treatments ......................................................... 26  
      1.2.2 Stand-alone Computer Treatments ....................................................... 28  
   1.3 Conclusions ............................................................................................... 29  

2. The Present Study ............................................................................................ 30  
   2.1 CALM for PD ............................................................................................ 31  
      2.1.1 Mode of Delivery ................................................................................ 31  
      2.1.2 The Therapist and Group ................................................................... 32  
      2.1.3 Treatment Content ............................................................................ 32  
   2.2 Research Design and Methods ................................................................. 34  
      2.2.1 Design ............................................................................................... 34  
      2.2.2 Participants ........................................................................................ 34  
         2.2.2.1 Inclusion criteria ......................................................................... 34  
         2.2.2.2 Exclusion criteria ....................................................................... 35  
      2.2.3 Procedure ........................................................................................... 35  
         2.2.3.1 Immediate Treatment .................................................................. 36  
         2.2.3.2 Delayed Treatment Procedure ................................................... 37  
   2.3 Measures .................................................................................................. 38  
      2.3.1 Diagnostic Interviews ........................................................................ 38  

CHAPTER 1

INTRODUCTION

Since the panic disorder (PD) diagnosis was formally introduced (DSM-III; APA, 1980), the disorder has been recognized as a serious problem in the psychological and medical communities. Lifetime prevalence rates for PD with and without agoraphobia are similar to that of most Axis I psychological disorders, ranging from 1.5% to 3.4% (Kessler, et al., 1998; Markowitz, Weissman, Oulette & Lish, 1989). Yet, the symptoms of PD prompt more visits to primary-care physicians (Katon, 1996) and hospital emergency rooms than other disorders (Weissman, 1991). These visits often result in expensive physical evaluations (Katon, 1996). Similarly, it has been shown that as many as 60% of patients who seek psychotherapy for anxiety-related problems meet criteria for PD (Michelson et al., 1996). In addition to this disproportionate use of medical resources, people who suffer from PD experience a lower quality of life than that of many other psychological disorders. Patients with PD show a higher rate of medication usage, marital problems, and substance abuse and are more likely to receive financial support from the government than patients with other disorders, including major depressive disorder (Weissman, 1991).
1.1 Cognitive-behavioral Treatment of PD

1.1.1 Efficacy of CBT Interventions

Fortunately, effective treatments for panic disorder have been developed and empirically supported. Although various modalities have been used effectively, meta-analyses of the treatment outcome literature have consistently demonstrated that multi-modal, cognitive-behavioral therapy (CBT) offers the most effective treatment for this disorder, when compared with pharmacological and other psychosocial interventions. Additionally CBT shows comparatively low dropout and relapse rates.

There have been a number of meta-analyses of the treatment of panic disorder in the past 15 years but only a few of the more recent investigations have been methodologically rigorous in their inclusion and exclusion criteria, their analytic strategies and their inclusion of both panic symptoms and agoraphobic avoidance symptom measures. These more recent analyses require that studies use an experimental design, random assignment to treatment conditions and control conditions (e.g., Westen & Morrison, 2001). They typically include both psychosocial and pharmacological treatments although some have focused on CBT in comparison to other psychological interventions. These studies support the conclusion that CBT is the most efficacious treatment for PD when compared with other modes of treatment when short and long-term effect sizes as well as attrition and relapse rates are considered.

Clum et al. (1993) conducted the first such meta-analysis. Twenty-nine studies from the years 1964 to 1990 were selected for their methodological rigor. The authors included overall mean effect sizes as well as the effect size for each dependent variable at post-treatment and follow-up. Both completer and intent-to-treat data were included.
These data were used to compare the effects of medication (anti-depressants, benzodiazepines, and other drugs) to CBT interventions (exposure, psychological coping/multi-modal CBT and combination CBT treatments). The authors concluded that multi-modal CBT interventions, including exposure, relaxation training and cognitive restructuring generally led to the strongest effect size for the reduction of symptoms across measures including panic frequency. The exception was that exposure-based treatments appeared to be the most effective interventions for panic symptoms ($d=1.09$) and avoidance ($d=1.03$).

A later meta-analysis of the PD treatment outcome literature conducted in 1995 (Gould, Otto & Pollack), reached similar conclusions with a larger sample size ($N = 43$ studies). The effectiveness of CBT interventions, including in vivo exposure, cognitive therapy, and multi-modal interventions in studies ranging from 1974 to 1994, was compared to that of pharmacological and combined treatments. The authors concluded that CBT interventions were more efficacious than pharmacological treatments (including anti-depressants and benzodiazepines) although the effect size estimates in this investigation were smaller than the earlier Clum et al. study ($d=.68$ and .47 respectively for CBT and pharmacology). Of the CBT interventions, in vivo was the most effective overall measure, while multimodal treatments including cognitive restructuring were most effective for the treatment of panic symptoms.

Westen and Morrison (2001) published the most recent and most stringent meta-analysis for the treatment of PD. They examined the efficacy of psychosocial treatments for the treatment of panic disorder with and without agoraphobia in a meta-analysis of treatment outcome studies published from 1990 to 1998. The authors analyzed 17 studies
from “high-quality, high-profile journals” as part of a larger meta-analytic study including treatment outcome studies of depression and generalized anxiety disorder (GAD). Data were included if participants in the investigation had been randomly assigned to treatment conditions and the study included a control group of wait-list, pharmacotherapy or another psychosocial intervention. In addition to effect sizes, the authors calculated the percentage of patients who showed clinically significant improvement and complete recovery. Intent-to-treat, completer analyses and short-term versus long-term effects were also examined. The overall, mean effect sizes for the impact of CBT interventions between- and within-subjects were high, \( d = .8 \) and 1.55 respectively. Sixty-three percent of the panic patients who completed treatment significantly improved from pre- to post-treatment. When intent-to-treat analyses were conducted, 54% of participants evidenced clinically significant change. Mean residual panic symptoms were low, with participants reporting an average of .7 panic attacks per week at post-treatment assessment. A few of the studies provided 12- 18 month (\( N = 3 \)) and 24-month (\( N = 2 \)) follow-up data. These studies indicated that participants who had participated in CBT interventions continued to show a strong effect on overall panic symptoms (\( d = 1.0 \) and 2.1 respectively). The one study that included intent-to-treat analyses at 12-18 month follow-up indicated that 73% of the original sample maintained their treatment gains. Despite these encouraging findings, the authors cautioned that the external validity of their analysis is questionable as most investigations had stringent exclusionary criteria, including the frequent exclusion of patients with moderate to severe agoraphobia. They also acknowledge that their own strict criteria for inclusion in the
overall analysis resulted in the exclusion of some potentially sound and informative investigations.

In light of the above findings, it appears that CBT offers the most effective treatment option for PD with and without agoraphobia. Additionally, CBT results in lower dropout and relapse rates. When coupled with the strong treatment impact and the tendency for patients to maintain treatment gains, it appears that CBT is the treatment of choice for PD.

1.1.2 Availability and Cost-effectiveness of CBT for PD

In addition to its efficacy, CBT for the treatment of PD appears to be the most cost-effective, therapeutic option. Gould et al. (1995) compared the estimated cost of individual and group CBT to pharmacotherapy over a 2-year period. Group-administered CBT was the least expensive intervention ($600) followed by treatment using imipramine ($912 with medication and psychiatric visits included). It is also reasonable to expect that CBT will be less expensive because of its lower relapse rate (Craske, Maidenber & Bystritsky, 1995) and time-limited approach (Newman, 2000).

Yet, despite the existence of such cost-effective treatments for PD, relatively few people seek treatment. Data from the National Comorbidity Survey indicates that only 66% of people mention their symptoms to a health care professional in the first year they experience PD symptoms (Olfson, Kessler, Berglund & Lin, 1998). Furthermore, only 85% of the people who report symptoms to a health-care professionally seek treatment for the disorder (Zimmerman & Mattia, 2000). Even fewer are treated with effective CBT interventions (Taylor, 1989).
Two primary factors are thought to account for the low participation rates in CBT for PD: the high cost of treatment and lack of accessibility (Cote et al., 1994). While CBT is a more cost-effective means of treating PD than other empirically supported approaches, it is time-consuming for the therapist and thus is financially out of reach for many people (Craske et al., 1995). Even when patients are insured, insurance companies are less likely to reimburse patients for psychological treatment than for medical disorders. An estimated 76% of people with mental disorders delay treatment because of the cost and they are at least twice as likely as those with medical disorders to be denied insurance coverage for treatment (Druss & Rosenheck, 1998). Finally, while group therapy is traditionally the most cost-effective delivery method, long waiting lists in smaller clinics while the staff gathers enough clients to form a group, makes the use of individual treatment more likely.

Difficulties accessing CBT for PD present an even larger barrier to treatment. Cognitive-behavioral interventions are usually only available in large cities making treatment seeking inconvenient or impossible for many potential clients (Cote et al., 1994). Additionally, the prevalence of agoraphobic symptoms in the PD population make it even less likely that locations that offer CBT are within reach (Holden et al., 1983). In order to maximize the utilization of CBT in the PD population, less expensive and more accessible treatment options are needed. Fortunately, a number of alternative treatment modalities have received empirical support in the past decade. The most common alternatives to traditional CBT for the treatment of PD include the remote-delivery of treatment, brief therapy, and bibliotherapy.
1.1.3 Alternative Treatment Modalities

1.1.3.1 Remote Therapy

As was previously discussed, accessibility can be a greater obstacle for patients with an additional agoraphobia diagnosis. For that reason, researchers have administered therapy remotely via telephone or the Internet. Typically, these interventions are designed to focus on agoraphobic symptoms using in-vivo therapy techniques. The efficacy of these remote delivery methods has been empirically supported in three, independent, randomized controlled trials (RCTs).

Two studies have demonstrated the effectiveness of CBT delivered via telephone for the treatment of agoraphobic symptoms in patients with PD. In the first of these the authors compared the effectiveness of an exposure-based treatment delivered via telephone to a credible treatment control (McNamee et al., 1989). Participants who met criteria for PD with agoraphobia and who were housebound were randomly assigned to receive telephone self-exposure instruction with supplemental bibliotherapy or a relaxation instruction control intervention.

Each participant received instruction from a therapist via telephone over the course of 12 weeks totaling 2-hours. Observer ratings, in which raters were blind to treatment condition, showed that the experimental group evidenced a significant decrease in agoraphobic symptoms from pre- to post- treatment as well as from pre-treatment to follow-up, while the control group did not improve. It is important to note that the findings of this study are limited by a small sample size, the failure of participants to return self-report measures, a high dropout rate, and the failure of the investigators to
administer an assessment of panic symptoms (McNamee et al., 1989). Yet, the strong
effect of the exposure-based intervention in a between-subjects analysis\(^1\) is encouraging.
In a more recent test of remotely delivered therapy, Swinson and colleagues (1995)
compared the efficacy of a telephone-based, exposure treatment to a delayed treatment
control. Patients from a rural area, who met criteria for a primary diagnosis of PD with
agoraphobia, were randomly assigned to participate in 10, weekly, 1-hour therapy
sessions over the telephone (\(N = 20\)) or waited 10-weeks before a second assessment (\(N
= 22\)). Patients in the active treatment condition showed significant improvement on all
symptom measures, including agoraphobia and general anxiety, from pre- to post-
treatment. The wait-listed group did not show improvement on any panic-related
measures. Participants in the active treatment condition maintained treatment gains, or
showed further improvement, at 3- and 6-month follow-up assessments. Effect size
analyses show that the intervention had a moderate effect on anxiety and agoraphobia (\(d
= .72\) and \(.74\)).

Finally, Carlbring et al. (2001), recently evaluated an updated version of remote-
contact treatment delivered via email (\(N = 9\)), in which the clients received unlimited
access to the therapist (mean therapist contact time of 90 minutes). The email interaction
with the therapist was supplemented with bibliotherapy instruction delivered over the
Internet. The treatment was a multimodal, CBT intervention similar to panic-control
therapy. The researchers compared the outcome for this active therapy group to that of a

\(^1\) In this and all subsequently discussed studies, effect sizes were calculated for the purposes of this paper
using Cohen’s \(d\) with pooled pre-treatment standard deviations. When needed, unweighted mean effect
sizes were used in favor of weighted calculations because of the small differences in sample sizes between
studies within each comparison (Hedges & Olkin, 1985).
wait-list control group (N = 12). Patients in the active treatment condition showed significant pre- to post-treatment change. Additionally, subjects who participated in the treatment showed significantly lower symptom levels than the wait-list group on all panic-related measures at post-treatment but were almost comparable to the control group on agoraphobic symptoms. An examination of the effect sizes and 95% confidence intervals for the intervention indicates that it had a significant moderate effect on panic intensity (d = .75) but that the moderate effects on panic frequency and agoraphobic symptoms (d = .72 and .74 respectively) were nonsignificant. Why did the email-based treatment fail to significantly impact agoraphobia when the other two remote-delivery interventions were effective? One possible explanation is that the sample in the former study was only slightly agoraphobic\(^2\), while the participants in the previous two telephone-based treatments were severely agoraphobic many even housebound as in the McNamee et al. (1989) investigation. It may be that very agoraphobic patients may be more motivated to participate in treatment.

Another possible explanation for the discrepant findings across modalities is that the two telephone-based treatments were primarily in vivo exposure-based and addressed agoraphobic symptoms, while the email treatment included multiple components. Additionally, of the three interventions, the email-based treatment provided comparatively less therapist contact (approximately 1 ½ hours per client) and relied heavily on bibliotherapy. It may be that the therapist contact provided in the telephone

\(^2\) These statements regarding the level of agoraphobia in the three studies in question were based on our examination of the pre- and post-treatment scores on the agoraphobia measures (the Fear Questionnaire in the McNamee et al. and Swinson et al. studies and the Mobility Inventory in the Carlbring et al. study) and a comparison with the clinical norms for these two measures (Marks and Matthews, 1979; Chambless et al., 1985. The means for the MI were recalculated for this comparison for the Carlbring et al. study because their scores were reported incorrectly.
treatment is an essential ingredient in the treatment of agoraphobic symptoms in this modality.

The findings of these three remote-delivery studies suggest that this mode of treatment delivery is effective for panic-related symptoms. This may be an effective solution to the accessibility issue as therapists could provide therapy to clients who are unable to leave their homes or reach the treatment clinic. Unfortunately, these interventions still require a clinician’s time, and thus still may be too costly for some patients.

1.1.3.2 Brief Interventions

In the past 10 years, researchers have developed another alternative to traditional therapy that offers effective treatment at a reduced cost. By providing brief versions of the standard CBT interventions for PD, the therapist reduces the amount of time spent with a client. In general, these brief treatments provide a condensed version of standard treatments and include adjunctive materials as a supplement, typically bibliotherapy, also called book therapy. To date, there have been four well-controlled studies of brief CBT for the treatment of PD either with or without supplemental bibliotherapy and they all indicate that brief therapy offers an effective treatment alternative to standard interventions.

While a few uncontrolled studies of the use of brief therapy without supplementary materials have been performed (Alford et al., 1990; Westling & Ost, 1999), Craske et al. (1995) conducted one of the few controlled studies in which brief therapy was used without the addition of supplemental materials. Patients with (67%) or without agoraphobia were randomly assigned to receive brief CBT (N = 16) or non-
directive supportive therapy (N = 13) in four, weekly sessions of variable length (60-90 minutes). The CBT intervention was a condensed version of panic-control therapy with the exclusion of in vivo exposure instructions.

Patients in the CBT group showed improvement from pre- to post-treatment on clinician-rated worry about panic and self-reported phobic distress. The control group did not show significant change on any panic-related measures. Neither group showed improvement on agoraphobic symptoms. An examination of the effect sizes for the treatment group indicates that CBT had a strong effect on panic frequency (d = 1.02) but a nonsignificant effect on agoraphobia (.). CBT participants showed clinically significant change on panic frequency and panic-related worry but only 38% of them met recovery criteria, compared to 7% of the control participants. The authors noted that the rate of recovery for the experimental group was lower than is typically found with CBT administered over a longer period. The treatment was most likely ineffective in treating agoraphobic symptoms due to the exclusion of in vivo exposure training module. The authors suggest that the inclusion of supplementary materials, such as audiotapes, may improve recovery rates in future studies.

Other researchers have included supplementary materials in their original investigations of brief therapy. Cote and colleagues (1994) conducted the first RCT that compared a reduced-contact intervention including supplemental bibliography to a standard treatment protocol. Patients with or without agoraphobia were randomly assigned, in blocks determined by symptom severity, to receive the reduced-contact intervention (N =12) or the standard treatment (N=10) over the course of 17 weeks. The standard treatment participants attended 17, weekly sessions while the session frequency
was reduced to 7 sessions with 8 supplemental phone conversations with a therapist in the brief treatment group. Both groups were given a bibliotherapy manual to supplement the live therapy.

Both treatments were very successful with participants showing improvement on all symptom measures from pre- to post- treatment and continued gains at 6- and 12-month follow-up. At the final assessment period, 100% and 91% of the standard treatment and reduced contact groups, respectively, had achieved panic-free status. No significant differences between groups were found on any symptom measures.

Clark et al. (1999) similarly compared a brief cognitive therapy (CT) intervention with a bibliotherapy supplement (N = 14) to a standard intervention (N = 14) and a wait-list control. Participants in the brief therapy condition received approximately half the therapist contact (mean contact = 6.5 hours) as the standard treatment group (mean contact = 12 hours). Participants in both treatment groups showed significant improvement on all symptom measures from pre- to post treatment while the waitlist group did not improve on any measures. These gains were maintained at 3- and 12-month follow-up and the treatment groups did not significantly differ from each other.

Botella and Garcia-Palacios (1999) conducted another study with a brief intervention, similar to the one that Craske et al. (1995) used, but with the inclusion of supplemental materials. Participants with a primary diagnosis of PD with (74%) or without agoraphobia were randomly assigned to receive a standard length CBT intervention (10 weeks; N =10) or a 5-week version of the same treatment (N = 10). The standard treatment included psychoeducation, cognitive therapy, breathing retraining,
minimal in vivo exposure, and instruction on “distraction” techniques, delivered in weekly, 50-minute sessions. The brief version of the treatment appeared relatively comparable, with the exception of in vivo exposure and distraction instruction, and was supplemented with bibliotherapy and an audiotape.

Both groups showed significant pre-to post-treatment changes on all panic and agoraphobic symptom measures. The groups did not show differential rates of improvement except that the CBT participants evidenced a greater decrease in the number of panic-related symptoms they reported from pre- to post-treatment. An examination of the effect sizes for the two conditions indicates that both treatments had an impact on panic frequency. Although inconsistencies in the data presented by the authors made it difficult to calculate the effect of the standard treatment on agoraphobic symptoms, the brief intervention had a large effect (d=1.80). While measures of clinically significant change were rather low at post-treatment for the standard and brief therapy groups, 50% and 30% respectively, these rates were acceptable at a 1-year follow-up assessment (standard = 70%; brief = 80%). Unfortunately, the sample size was too small to find statistical differences between two active treatment conditions at any assessment point. However, the strong effect of the brief intervention on symptoms indicates that 5 sessions of therapist-administered treatment with supplemental materials was a successful treatment approach.

Overall, these controlled studies of the impact of brief interventions on PD with and without agoraphobia support the use of these alternatives to standard treatment. While in most cases, standard length, comparison treatments resulted in slightly more
improvement. In all but one study (Craske et al., 1995), the brief interventions resulted in large effect size differences from pre- to post-treatment. The failure of the Craske et al. intervention to affect change in agoraphobic symptoms is easily explained by the lack of in vivo exposure training in their brief intervention.

While remotely delivered treatments make CBT more accessible, they fail to obviate the need for costly contact with a therapist. Even when briefer versions of these treatments are used, they still require some therapist contact (Carlbring et al., 2001). Additionally, while they appear to offer an effective treatment for agoraphobia-related symptoms, there is little data supporting their use for the treatment of panic. Brief interventions, on the other hand, are clearly effective for the treatment of both panic and agoraphobia especially when adjunctive bibliotherapy is included. Yet, while they provide a less expensive CBT alternative, they still require a therapist and thus do not solve the accessibility problem associated with longer interventions.

1.1.4 Bibliotherapy

For the last 20 years, bibliotherapy, defined as therapy delivered in book format for the purposes of this paper, has provided an alternative to therapist-administered treatment that is both cost-effective and highly accessible. Typically, bibliotherapy interventions for PD include one or two chapters with educational information about the nature of panic disorder followed by chapters in which the therapeutic techniques included in standard, multi-modal CBT interventions are described. Practice assignments, at the end of each chapter, provide instructions akin to what a therapist would assign to a client at the end of a therapist-administered, CBT session.
Meta-analyses of self-help approaches for psychological disorders have demonstrated that bibliotherapy is effective for many conditions and is most useful for the treatment of anxiety and problems related to skill deficits and weight loss (Marrs, 1995; Gould & Clum). Marrs (1995) synthesized 15 controlled studies in which the experimenters administered self-help approaches for the treatment of anxiety, as part of a larger meta-analytic investigation. The large mean effect size estimate (d = .91) signifies that self-help approaches are effective for fear-related disorders. The 95% confidence interval for this estimate, in which the strength of the effect was moderate to high (.73; 1.08), reinforces this conclusion.

While the above-mentioned meta-analyses suggest that self-help is generally effective for the treatment of anxiety disorders, more information is needed to determine how well bibliotherapy impacts panic-related symptoms. A number of RCTs of bibliotherapy for the treatment of PD have been conducted in the past 10 years. The best-studied intervention is “Coping with Panic” developed by George Clum (1990). Coping with Panic is an 11-chapter book that includes instruction on psychoeducation, coping mechanisms, cognitive restructuring, paradoxical intention, exposure (interoceptive and in vivo) and the elimination of avoidance behavior.

Two studies have examined the efficacy of Coping with Panic, without the addition of other media (Gould, Clum & Shapiro, 1993; Lidren et al., 1994). Specifically, Gould et al. (1993) asked participants (N = 11) who met criteria for PD with or without agoraphobia to complete Coping with Panic in a 4-week period. The researchers compared the effect of this intervention with a therapist-administered version
of Clum’s treatment delivered in a group format (N = 9). A wait-list control group was also included in the study (N =11). The therapist-administered treatment consisted of eight, 1-hour, group sessions of “Guided Imaginal Coping”, which was described as an adaptation of the bibliotherapy intervention.

Overall, the bibliotherapy group showed the most pre- to post-treatment symptom change but neither of the groups evidenced a significant improvement on agoraphobic avoidance. Specifically, while both active treatment groups showed improvement on panic-related cognitions and panic attack symptoms, the bibliotherapy condition showed a superior rate of improvement on panic frequency. None of the groups evidenced significant change on agoraphobic avoidance or the average severity of their panic attacks.

When the authors compared the groups on a non-standard measure of clinical improvement devised by the first author, whereby a 50% rate of symptom reduction or panic-free status was considered clinically improved, the bibliotherapy group showed a superior rate of improvement to the therapist-administered treatment and wait-list groups. An examination of the size of the effects and the associated confidence intervals for the bibliotherapy intervention indicates that while bibliotherapy had a strong effect on panic frequency (d=1.54), it had a small, non-significant effect on panic symptoms (d=. 36) and agoraphobic avoidance (d=. 38).

Clum’s research group conducted a similarly designed study a year later and found stronger support for the use of Coping with Panic as a self-administered treatment for panic and agoraphobia (Lidren et al., 1994). As in their previous study, participants who met criteria for PD with (83%) or without agoraphobia were randomly assigned to
bibliotherapy (N = 12), therapist-administered treatment (N = 12), or a wait-list control group (N = 12). Patients in the active treatment conditions evidenced superior performance when compared to the wait-list group on all panic-related measures at post-treatment. As in the previous study, participants in the bibliotherapy condition showed marginal pre- to post-treatment change on agoraphobic avoidance but in this case, the bibliotherapy group showed a significantly higher rate of change than the wait-list participants.

How can we explain the differences in effectiveness of bibliotherapy between these two studies? One potential explanation is that the higher sample size in the more recent study could be allowing researchers to find differences with increased statistical power. Yet, an analysis of the effect sizes of the two active treatment groups in both studies (see ) shows that the effect sizes for the two appear dissimilar. The bibliotherapy intervention had a strong effect on panic symptoms, panic frequency and agoraphobic avoidance in the Lidren et al. study (1994) while as was previously discussed, a strong effect was only evident for changes in panic frequency in the Clum et al. study (1993).

Another potential explanation for the differential findings of these two tests of Coping with Panic could be the increase in duration of the intervention in the latter study (Lidren et al., 1994) to 8 weeks from the 4 weeks used in the earlier investigation (Gould et al., 1993). It may be that this intervention affects panic frequency early in treatment followed by changes in panic-related symptoms and agoraphobic avoidance. An additional factor to consider is the much lower incidence of agoraphobia in the latter study when compared to the former, less successful intervention (94% and 30% agoraphobia respectively).
While it appears that Coping with Panic is effective for the treatment of panic and agoraphobic symptoms when patients have access to it for an 8 week period, the generalizability of these findings are limited because the experimenters required bibliotherapy participants to monitor their symptoms weekly. In a naturalistic setting, patients would not have this type of monitoring. It could be that self-monitoring increases demand characteristics and influence the efficacy of the intervention (Febbraro, Clum, Roodman & Wright, 1999).

As a test of the impact of monitoring on treatment outcome, Clum’s group compared treatment outcome for participants who completed the bibliotherapy alone (N = 17), bibliotherapy with monitoring (N = 15) and monitoring alone (N = 13) to a wait-list control condition (N = 18; Febbraro et al., 1999). The researchers used an eight-week intervention as in their previous study and a larger sample size. None of the conditions differed statistically from each other although two of the three panic indices in the bibliotherapy with monitoring group were moderate while all of the bibliotherapy alone estimates were low. Monitoring alone appeared to have a moderate effect on panic symptoms and agoraphobic avoidance.

Only 6% of the participants in a combined active treatment group analysis evidenced reliable change on agoraphobic symptoms while none of the participants met this criterion for change in panic-related symptomatology. Therefore, it appears that monitoring affects the efficacy of the Coping with Panic intervention. Yet, these findings should be interpreted with caution because only 75% of the participants met criteria for current PD at the time of treatment in the Febbraro et al. investigation (1999). The other subset of the sample was included because they experienced panic-related symptoms in
the two weeks before the beginning of the study. Additionally, the rate of agoraphobia in the sample was not presented and there was a high dropout rate (32%). Yet, the failure of the 8-week treatment in this study challenges the conclusion that Coping with Panic is effective in this longer format.

Similar care should be taken in evaluating a follow-up to the Febbraro et al. (1999) study in which Wright and colleagues (2000) examined the effect of a 6-month, relapse-prevention protocol on some of the participants from the previous treatment protocol. Thirty-six of the completers from the previous study were randomly assigned to receive relapse-prevention (N = 17) or to serve as a wait-list control group (N = 19). The relapse-prevention component included 6-month access to a written intervention derived from Coping with Panic, which focused on preventing relapse. Monthly 15-minute phone conversations with a therapist were used to encourage and assess compliance in addition to maximizing the curative and preventative effects of the intervention. Retrospective report of change in panic-related symptoms revealed that the relapse prevention group significantly improved on measures of panic frequency, panic cognitions, anticipatory anxiety and agoraphobic avoidance, but not coping skills. Wait-listed participants failed to show significant change across the relapse prevention period.

The strength of the effects of the Wright et al. intervention on panic-related symptoms is difficult to calculate accurately due to inconsistent reporting. Yet, it appears that the relapse prevention component, as noted by the authors, was more effective than the treatment itself. While multiple variables may be responsible for this difference including selection biases and increased exposure to the material, the authors attribute the
success of the intervention to the inclusion of monthly, 15-minute phone calls. The authors note that the phone calls were well received by the participants.

The conclusions that can be drawn from the above findings are limited. In order to fully determine the effectiveness of the Coping with Panic intervention, future investigations should administer the treatment to a sample that meets the full criteria for PD with agoraphobia, in the absence of required self-monitoring compared to a monitoring group and a therapist-contact group.

Additionally, the treatment itself should be examined. From the above findings, one may be tempted to conclude that Coping with Panic is as effective as or more effective than therapist-administered live therapy. Yet, it is important to note that in both cases in which live therapy was included, bibliotherapy was compared to a therapist-administered treatment derived from the bibliotherapy intervention. The experimenters did not compare Coping with Panic to an empirically supported treatment for PD, such as panic control therapy. Such a comparison would give a better picture of the comparability of bibliotherapy to therapist-administered treatment.

Barlow and Craske have written a workbook (Mastery of your Anxiety and Panic; MAP; 1994) that parallels therapist-administered, panic-control therapy. This workbook is typically used in conjunction with therapist-administered treatment but was used as a bibliotherapy intervention in one published study (Hecker, Losee, Fritzler & Fink, 1996). Hecker and colleagues tested the effectiveness of the MAP intervention used as a bibliotherapy treatment. Sixteen patients with an Axis I diagnosis of PD or PDA (after two subjects dropped out and were replaced) were randomly assigned to self-directed (N = 8) or therapist-led treatment (N = 8).
Participants in the self-directed condition completed the 15 chapters of the MAP workbook alone over a 12-week period. These clients met with a therapist four times to receive assignments and assessments. The other group was led through the MAP workbook in 12-weekly, individual sessions with a therapist. At post-treatment, the groups evidenced statistically similar levels of symptom change, possibly failing to evidence a difference due to a small sample size.

Using a conservative criterion, 49% and 37.5% of the self-directed and therapist-led participants respectively showed clinically significant change. Similarly, 40% of the self-directed and 20.6% of therapist-directed participants achieved high-end state functioning by the 6-month follow-up assessment. These percentages were noticeably lower when dropouts were included in the analyses. The dropout rate was marginally higher in the self-directed condition (N = 3) when compared to the absence of dropouts in the therapist-led condition. As there was not a significant difference between the two groups at pre-treatment, the authors were not able to explain this difference. It is important to note that 61% of the sample was diagnosed with Axis II disorders. Yet, the authors attribute this to over zealous graduate students who conducted the diagnostic interviews and the authors do not think that their sample was as highly disordered as these estimates would indicate.

While it is difficult to make a definitive statement about the efficacy of bibliotherapy for PD, the cumulative findings of the above-mentioned studies suggest that these interventions are not as effective as empirically supported therapist-administered treatments, brief therapy interventions or remotely delivered treatment. Why are these bibliotherapy interventions relatively unsuccessful? In the case of Coping with Panic, it
is possible that the intervention itself is less than optimal given the low to moderate impact of this intervention when delivered as a therapist-assisted treatment. While the protocol includes treatment components similar to those of panic-control therapy, such as in vivo exposure and cognitive restructuring, a substantial part of the treatment is devoted to teaching coping mechanisms. These coping mechanisms serve as safety behaviors that may prevent clients from habituating during in vivo and interoceptive exposure sessions (Clark, 1999).

Another potential explanation for the relatively low effect sizes in the above bibliotherapy investigations may be that bibliotherapy fails to engage and motivate clients, resulting in poor performance. Holden et al. (1983) reported the findings from a series of case studies (N = 6) in which agoraphobic women participated in a multi-modal bibliotherapy intervention. While this investigation did not include a control group or a standardized number of sessions and thus is not useful in our evaluation of the efficacy of bibliotherapy interventions, the authors’ examination of compliance and response to treatment may give some insight into the bibliotherapy experience. The treatment, similar to Coping with Panic in its inclusion of psychoeducation, cognitive restructuring, and in vivo exposure instruction, failed to stimulate compliance in the participants. When the authors explored the cause of this lack of compliance, participants reported a lack of motivation and boredom in addition to idiosyncratic excuses.

The lack of motivation may affect treatment outcome via reduced compliance with treatment related assignments. While Clum and colleagues typically assess compliance with instructions to read Coping with Panic using a quiz on the written material, they have not measured their clients’ compliance with between-chapter
assignments. Unmotivated clients who may not have practiced newly acquired skills would be unlikely to succeed in treatment as compliance with CBT homework has been shown to be highly predictive of treatment success (Schmidt & Woolaway-Bickel, 2001).

Another explanation for the low success rate for bibliotherapy interventions may be that some facets of treatment are difficult to communicate in a written format. Gould & Clum (1995) attempted to solve this potential limitation by adding video and audio components to the traditional Coping with Panic intervention in order to improve upon the instruction previously provided in a written format. Patients were recruited from the university and surrounding community. Of the final sample (N = 20), 84% met criteria for agoraphobia in addition to PD. Patients were assessed before receiving treatment, at post-treatment, and eight weeks after the completion of the intervention. They were matched on their pre-treatment level of behavioral avoidance and then randomly assigned to receive the four-week self-help intervention or a wait-list control. The self-help treatment included Coping with Panic, a psychoeducational videotape about PD and diaphragmatic breathing instruction. A progressive muscle relaxation audiotape was also provided to each treatment participant.

Analyses indicated that the self-help group showed a significant decrease in panic-related symptoms from pre- to post-treatment and at follow-up, including panic-attack severity, panic-related cognitions, avoidance, and the ability to cope with panic, while the WL control group did not show these differences. When the groups were compared at post-treatment, the only statistical differences were on panic frequency and fear of panic from pre- to follow-up assessment. At post-treatment, the self-help and control participants, respectively, were panic-free. The failure to find group differences
in symptom change could be attributable to a lack of statistical power, yet the intervention yielded a relatively low rate of patients who achieved a panic-free status (46%).

1.1.5 Summary

Three alternative CBT treatment modalities, (remotely-delivered treatment, brief therapy and bibliotherapy) provide potential solutions to the low rate of treatment seeking in the panic-disordered population. Unfortunately, none of these treatment options is ideal. While remote and brief therapy are highly effective, they remain costly and inaccessible for some participants. On the other hand, bibliotherapy is cost-effective and accessible to all literate individuals. Unfortunately, it is not reliably effective and appears to be unpalatable to some clients. Until recently, these three alternatives were all that was available to people who were unable to receive traditional CBT. Fortunately, with the evolution of computer technology, it may be possible to provide a self-help approach that is cost-effective, accessible, and efficacious with the use of computer-administered treatment.

1.2 Computer-administered Treatments for PD

Computers have been used in the treatment of anxiety disorders for almost 25 years. Historically, these interventions were used to provide systematic desensitization for specific phobias and non-clinical anxiety (e.g., Biglan, Villwock & Wick, 1979). Initially, technology was limited and these treatments were similar to bibliography in that they provided solely written information. Despite the text-based nature of these treatments, people continued to develop them because they were more interactive than bibliotherapy, took less of a clinician’s time, and were thus more cost-effective.
With the development of technology, computers now offer almost limitless possibilities for making self-help treatment accessible and interactive. Initially, one may conclude that computers are not as cost-effective as bibliotherapy because of the cost of the computer itself. Fortunately, home computers are becoming more prevalent each year (Economics and Statistics Administration, Bureau of the Census, 2002). Additionally, the majority of American workers have access to a work computer (Census, 2002). It has been estimated that 66% of the population regularly used computers 2 years ago and this number is steadily increasing (U.S. Department of Commerce Report, 2002).

The cost of attaining a home computer has also dropped substantially and a complete system is now available for less than the cost of a course of group CBT for one person (Dell- $499). Computer treatments themselves could be available for a nominal fee as low as $2 to cover the cost of copying a CD and mailing the treatment. This is even lower than that of bibliotherapy because currently, participants in this type of treatment are required to buy the self-help book.

There are a number of potential benefits associated with computer interventions. They provide the potential for perfectly controlled treatment delivery, 24-hours a day (Newman, Consoli, & Taylor, 1999). Additionally, the treatment can be more confidential and less stigmatized than traditional interventions. Finally, with the advent of new multi-media software, these treatments can be highly individually tailored and include video and audio components.

As computer technology has advanced, development of computerized versions of bibliotherapy and therapist-administered treatments have begun to provide an alternative to the traditional modes of treatment delivery. Computer-administered treatment (CAT)
interventions are self-help approaches in which treatment is delivered via a computer. The utility of CAT interventions parallels that of bibliotherapy, ranging from providing a supplement to traditional treatment at varying degrees to serving as a stand-alone treatment in its own right.

In CAT, the computer presents all didactic information and therapeutic interventions, while in alternative, adjunctive computer interventions the computer is a supplement to traditional therapy. Most commonly, researchers have tested the use of computer-based applications as adjuncts to brief therapy although one study has examined a treatment protocol that could potentially be used as a stand-alone intervention. Despite the long history of the use of computers in the treatment of anxiety disorders, relatively few treatments have been developed and empirically supported for the treatment of PD.

1.2.1 Adjunctive Computer Treatments

Recently, it has become more common for researchers to add computer-administered instruction to supplement brief therapy interventions. This material, typically delivered via palmtop computer, is more individualized and interactive than bibliotherapy or videotape supplements. For example, Newman and colleagues (1996; 1997) have developed a computer program for a palm-top that includes two modules that lead the patient through cognitive restructuring and diaphragmatic breathing practice. A diary function is included for periodic symptom ratings.

Newman et al. (1997) evaluated the efficacy of a live, 4-session, CBT intervention with eight weeks in which their adjunctive computer therapy was available.
Patients with a primary diagnosis of panic disorder with or without agoraphobia were randomly assigned to receive brief therapy with adjunctive computer treatment (N = 9) or a standard 12-session, panic control therapy protocol (N = 9). Patients in the brief therapy condition received an abbreviated version of the standard treatment in four, weekly sessions, totaling six hours of live treatment.

During a baseline period, participants in both groups were allowed to use palmtop computers in a “diary only mode”. After their first session, clients in the adjunctive computer treatment group were instructed to switch their computers to a “treatment-plus-diary mode”. They were allowed to use the computer for the remainder of the intervention (12 weeks) as needed while standard therapy patients continued with to use the computer solely as a diary for recording their symptoms once a day.

At post-treatment, both groups showed significant improvement on all panic-related symptoms. The 12-session, standard therapy group showed a higher rate of clinically significant change and functional recovery on panic frequency and fear of body sensations. At 6-month follow-up, both groups retained their treatment gains and the groups did not differ on reliable change and recovery indices. An examination of the effect sizes for this intervention shows that there was a strong effect on panic (d= 1.58) but a smaller, non-significant effect on agoraphobic avoidance (d= .85; 95% CI = 0, 1.77) for computer supplemented therapy. As acknowledged by the authors, this study was also limited because it did not include a non-treatment control group or a comparison group in which patients completed the abbreviated treatment without computer access. As this study provides the only controlled test of this supplementary, palm-top
intervention for the treatment of PD, larger RCTs are needed to determine the true
efficacy of this intervention.

Kenwright, Liness and Marks (2001) have tested another supplemental computer
intervention, although they have not validated it in a randomized controlled trial and their
sample was comprised of patients who met criteria for one of a number of disorders
(agoraphobia-N=14, social phobia-N=9, specific phobias-N=8 and GAD-N=1). A nurse
administered the intervention, a computerized treatment called Fear Fighter. The
computer was used to supplement approximately 2/3 of the time typically spent with
participants in the standard form of this intervention. Unfortunately, this supplemental
computer program does not appear promising as there was a small, non-significant effect
on total phobia scores on the FQ (d=.35, 95%CI - .03, .73).

1.2.2 Stand-alone Computer Treatments

To date, the majority of stand-alone CAT interventions, in which computers are
used as the sole treatment provider, have been treatments for specific phobias or phobic
anxiety conditions. The findings indicate that these treatments are useful in alleviating
these specific fears. Ghosh and Marks (1987) have conducted the only published study
using a potentially stand-alone treatment of PD with agoraphobia via the computer. Their
exposure-based treatment directs patients using onscreen text through designing fear and
avoidance hierarchies and exposure practice assignments. This treatment was not used as
a pure CAT intervention because a therapist delivered the treatment rationale in the
computer-based condition as well as the other two therapy groups and the patients met
with the psychiatrist each week, with a mean total of time spent with a therapist at 2.7 hours for the computer group.

Patients with a primary diagnosis of PD with agoraphobia were randomly assigned to one of three treatment conditions: CAT (N = 15), bibliotherapy (N = 13) and therapist-administered treatment (N = 12). The computer treatment was delivered via a desktop, personal computer while the therapist-administered treatment was conducted by a psychiatrist. Patients received treatment for eight sessions of variable length. Patients in all groups showed significant improvement on measures of panic and agoraphobia. Analyses did not reveal any statistically significant differences between treatment groups. The results of effect size analyses indicate that all of the treatment incarnations had a strong effect on panic frequency. While the treatment strongly impacted agoraphobic symptoms in the therapist-administered and bibliotherapy conditions, the CAT had a moderate but non-significant effect on agoraphobic avoidance (d=. 67 ; CI(95%) 0, 1.39).

1.3 Conclusions

While computers offer the ability to present self-help treatments that have the benefits of bibliotherapy with added potential for engagement, the treatments reported to date do not indicate that these treatments are developed enough to provide effective treatments for PD with agoraphobia. Computer interventions are needed which use new technology to increase compliance, motivation and engagement as well as to deliver treatments that are as effective as standard CBT interventions.
CHAPTER 2

THE PRESENT STUDY: DESIGN AND METHODS

The present study provides the first test of the feasibility and effectiveness of CALM, a new, computer-administered treatment for PD and agoraphobia. CALM is the most sophisticated self-help treatment to date. It includes video, audio and text as well as a “therapy group” played by actors. This treatment takes the next step in developing an accessible, cost-effective, self-help treatment for panic disorder by improving upon traditional bibliotherapy and earlier computer-based interventions. Our goal in designing this treatment was to create a self-help approach that resembles live, therapist-administered treatment, with the intention of making a more palatable, motivating and thus effective intervention.

Participants, with a primary diagnosis of PD with or without agoraphobia, were randomly assigned to an immediate or delayed treatment control condition. The participants in the immediate treatment group received 10 sessions of CALM, twice per week. While the others participated in a 5-week wait-list control period followed by treatment. Measures of panic and agoraphobic symptoms were administered at the beginning and end of the 5-week treatment or wait-list period, serving a dual purpose as a pilot investigation of the feasibility of this new treatment as well as its efficacy.
2.1 CALM for PD

CALM for PD (Computer-administered Learning Module for Panic Disorder) is a multi-modal treatment including psychoeducation as well as in vivo and interoceptive exposure training.

2.1.1 Mode of Delivery

CALM was delivered via desktop PC. It was developed, by Kelly Woolaway-Bickel, using Macromedia Director software and includes video, audio, and text. Approximately two thirds of the treatment is comprised of audio accompanied by text. The rest of the treatment is video-based with supplementary text. The computer program is moderately interactive. In addition to the above, participants respond to onscreen quiz questions during the psychoeducational portion of treatment. Correct responses are required for the patient to proceed to the next module. An incorrect response is followed by a review of the preceding material and a chance to redo the quiz. This process continues until the client has grasped the material.

The other interactive portion of the treatment allows the patient to choose from a menu of options providing personally-relevant information about between-session exercises. For example, a client who finds standing in lines difficult can select that option from a menu of feared situations and learn graduated exposure-based exercises to overcome this difficulty.

While it is intended that CALM will eventually administered via CD where convenient for the patient, this initial administration of the intervention was delivered in the Anxiety and Stress Disorders Clinic (ASDC) on the Ohio State University campus.
By administering the treatment at regular appointments, we were able to monitor completion of the treatment.

2.1.2 The Therapist and Group

A computer therapist (KWB) narrates the treatment, by video and audio. Pilot testing has shown that the video therapist is perceived positively and is seen as demonstrating important, non-specific attributes that are thought to predict success in treatment (e.g., empathy and unconditional positive regard; Woolaway-Bickel & Schmidt, 2001). In addition to the therapist, there is a prototypical therapy group played by three professional actors of varying ages and ethnicities. Each group member is introduced in Session 1 with a 5-10 minute monologue. After Session 1, they participate in each subsequent session by reporting on their between-session, exposure practice from the previous week and designing plans for the upcoming week.

2.1.3 Treatment Content

The treatment is based on a 10-week therapist-administered treatment that has been used in the ASDC. The first two sessions include psychoeducation in which the participant is introduced to the nature and causes of PD. The remainder of the treatment centers on in vivo and interoceptive exposure. Exposure is presented in the context of fading safety behaviors and adopting an anti-phobic approach. Safety behaviors are any action that is used to prevent or reduce an inaccurately perceived, false threat or its consequences. These behaviors include avoidance of situations and sensations, the use of companions, cognitive avoidance (e.g., distraction), compulsive behaviors and substance use. Patients are taught to fade the use of safety maneuvers gradually. This results in graduated exposure to feared situations and body sensations.
The other focus of the treatment is the adoption of an anti-phobic attitude and behavior, which is a mild form of paradoxical intention. For example, if a patient fears fainting in public the anti-phobic complement to this is to pretend to faint in a public place. Similarly, if someone fears the experience of a racing heart, he or she would engage in interoceptive exposure exercises in order to bring on those sensations. The patients are taught to do anti-phobic exercises that result in no more than mild levels of anxiety.

A pilot study of the therapist-administered variation of the Safety Aid Treatment described above indicates that this type of treatment is effective. Participants were randomly assigned to receive treatment in a group format or participate in a wait-list control. Where the CALM module being tested in this study targets PD, the therapist-administered treatment was designed to address a number of anxiety disorders including PD, social phobia, agoraphobia and specific phobias. CALM includes only the panic and agoraphobia-related information from this treatment.

Preliminary analyses of pre- to post- treatment data from participants with a primary diagnosis of panic disorder with or without agoraphobia (N=9) who participated in the active treatment condition in this therapist-administered trial, indicated that this treatment has a strong, within-subjects effect on anxiety, panic and agoraphobic symptoms.
2.2 Research Design and Methods

2.2.1 Design

Twenty-two participants (see power analysis below) were matched on severity of panic and agoraphobic symptoms and randomly assigned to one of two treatment conditions: treatment via CALM or a delayed treatment control condition, in a matched-pairs design. Panic-related symptoms were assessed at baseline (baseline), immediately before the intervention phase (Time 1) and at post-treatment (in week 6; Time 2).

2.2.2 Participants

Participants were recruited from the community and OSU campus through advertisements in the newspaper. One hundred forty-seven people responded to the advertisement. Of those who responded to the ad, 52 people reported panic symptoms and expressed initial interest in the treatment. These participants were screened on the telephone using a brief, structured interview. Thirty-seven participants met our inclusion criteria and were invited for an in-person, diagnostic interview. Thirty-two people were interviewed as potential candidates for the intervention and were asked to participate in the study. Twenty-two people completed the baseline self-report questionnaires in addition to the interview and agreed to participate in the study. The final sample was predominately female (73%), Caucasian (91%) and employed full-time (55%). Their ages ranged from 21 to 65 years with a mean of 42 years of age (see Table 7 in Results section for group distributions).

2.2.2.1 Inclusion criteria

1. Primary diagnosis of panic disorder with or without agoraphobia.

2. Patients had to be between 18 and 65 years of age.
3. Patients who were currently taking medication for the treatment of panic disorder on a regular basis had to be willing to keep their dosage constant through the 6-week evaluation period.

2.2.2.2 Exclusion Criteria

People were not asked to participate in the study if they met any of the following criteria:

1. Lifetime history of bipolar disorder, schizophrenia, or organic mental disorders.

2. Current suicidal ideation.

3. Lifetime history of severe medical disorders that could complicate panic disorder including cardiovascular, respiratory or renal disorders, stroke, epilepsy or hypertension. This information will be collected during the diagnostic interview.

4. Initiation or reinitiation of tricyclic antidepressants, SSRI’s, or MAO inhibitors during the past 6 months.

5. Initiation or reinitiation of benzodiazepines in the past 30 days.


7. Initiation or reinitiation of psychotherapy in the 3 months before the treatment trial.

2.2.3 Procedure

After the phone interview, participants who were not subsequently invited to visit the lab for a more thorough assessment were referred to other treatments in the community as was appropriate as the ASDC was not taking any new clients at the time of this study due to clinic reorganization.
All substantive interactions with clients were conducted by trained research assistants (assessments) or advanced undergraduate students (subsequent appointments) in order to reduce interactions with the therapist from the computer intervention (KWB).

The initial assessment, as well as the post-treatment assessment, included the administration of the Anxiety Disorders Interview Schedule for the DSM-IV (ADIS-IV), conducted by a trained administrator who was blind to treatment condition. The majority of interviews were audio/videotaped with participant approval. All pretreatment interviews for clients who continued the treatment protocol, were rated by a second trained interviewer. The raters had a 96% rate of agreement (kappa = .78).

Participants who qualified for the treatment study after the Time 1 interview were matched with another participant and were randomly assigned to receive immediate treatment or wait 5-weeks to begin a delayed treatment. Participants in the immediate treatment condition began treatment within two weeks of the Time 1 assessment interview. Validated self-report measures of panic-related symptoms were completed after the interview and returned to the experimenter in person or by mail (in the delayed treatment group). A brief symptom questionnaire was completed by participants daily for 1-week after the initial assessment to establish a baseline level of panic-related symptoms.

2.2.3.1 Immediate Treatment

The treatment was administered twice weekly at scheduled appointments. At each appointment, a trained undergraduate administrator asked the participant to complete a symptom monitoring form for the intervening period between sessions. These forms were used to alert the experimenter to any drastic changes in symptoms. After the
subject completed the monitoring form, the student administrator began the computer session and left the room until the session was completed. All interactions between the research assistants and the participants were audio taped to ensure compliance with the study protocol. Time 2 self-report measures were administered immediately after the tenth treatment session. The Time 2 assessment was conducted subsequently by a trained interviewer who was blind to treatment condition and was conducted in the same manner as the pre-treatment interview either in-person or by telephone.

2.2.3.2 Delayed-treatment procedure

Participants in the delayed treatment group were asked to complete monitoring forms twice weekly during the 5-week waiting period and to mail them in addressed, stamped envelopes to the experimenter. This monitoring was necessary for two reasons. First, as was discussed above, monitoring appears to have a significant impact on self-help procedures (Febbraro et al., 1999). We intended the inclusion of symptom monitoring in the control condition to help ensure that the two conditions were as comparable as possible in this respect. Additionally, the primary investigator used these measures to make sure that participants in the control group did not show significant decrements in functioning that might have required immediate intervention. After completion of the 5-week wait-list period, participants were reassessed as described above and then received treatment within two weeks. No further assessments of these participants were included in this analysis although clients in the control group were asked to report symptom levels during the course of treatment.
2.3 Measures

2.3.1 Diagnostic Interviews

2.3.1.1 Anxiety Disorders Interview Schedule-IV (ADIS-IV)

The ADIS-IV (Di Nardo, Brown, & Barlow, 1994) is a semi-structured interview that provides a detailed assessment of each anxiety disorder as well as other Axis I disorders. The ADIS-IV has demonstrated adequate inter-rater reliability for PD although obtaining a consistent rating of agoraphobia has been problematic in the past (Brown, Di Nardo, Lehman, & Campbell; 2001). Clinician-ratings of symptom severity were collected during the Time 1 interview using the MC-PAS rating scale that accompanies the ADIS-IV.

2.3.1.2 Telephone Screening Interview

The telephone interview was derived from the ADIS-IV and utilizes diagnostic screening questions and health-related questions to quickly identify unqualified participants.

2.3.2 Symptom Measures

The following self-report measures were administered at each assessment period.

2.3.2.1 Beck Anxiety Inventory (BAI)

The BAI (Appendix A) is a reliable and valid measure of anxiety symptoms, which have little overlap with depression (Beck, Epstein, Brown & Steer, 1988). The questionnaire is a 21-item self-report measure and has been adequately normed on PD samples with and without agoraphobia as well as on other anxiety disorders and normal control participants.
2.3.2.2 Mobility Inventory for Agoraphobia (MI)

The MI (Appendix B) is a 4-part self-report measure designed to assess the severity of agoraphobic avoidance as well as panic symptoms (Chambless, Caputo, Jasin, Gracely & Williams, 1985). Participants rate the degree to which they avoid feared situations when alone and when accompanied on a 6-point Likert scale. Participants also rate the frequency of panic attacks in the past week. This measure has been shown to be reliable and valid in both clinical and non-clinical samples (Chambless et al., 1985).

2.3.2.3 Fear Questionnaire (FQ)

The FQ (Appendix C) is a 24-item, self-report measure that is used to measure phobic anxiety and related depression (Marks & Mathews, 1979). It has been shown to be reliable and valid. The agoraphobia subscale, which has been normed in an agoraphobic sample, was used in the present study.

2.3.2.4 Body Sensations Questionnaire and the Agoraphobic Cognitions Questionnaire

The BSQ and ACQ (Appendices D and E) are complementary measures of symptoms associated with panic disorder and agoraphobia (Chambless, Caputo, Bright & Gallagher, 1984). Both the 15-item ACQ and 18-item BSQ are scored on a 6-point Likert scale and have been shown to be reliable and valid (Chambless & Gracely, 1989). They have been normed on both clinical and community samples (Chambless et al., 1884), and reportedly discriminate between people with PD and other disorders as well as non-clinical controls. The ACQ measures cognitions associated with panic disorder and includes 2 subscales: loss of control and physical concerns. The BSQ yields a total score that indicates the degree to which the person fears anxiety-related symptoms.
2.3.2.5 Anxiety Sensitivity Index (ASI)

The ASI (Appendix F) is a 16-item measure of the fear of anxiety-related symptoms (Reiss, Peterson, Gursky & McNally, 1986). The measure has been shown to be reliable and valid (Reiss et al., 1986) and has been adequately normed on people at varying severity levels of PD with and without agoraphobia as well as other anxiety disorders and non-clinical samples.

2.3.2.6 Beck Depression Inventory-II (BDI-II)

The BDI-II (Appendix G) was used to assess depression at Time 1 and 2. This revised version of the original BDI includes 21-items that provide a reliable and valid assessment of depressive symptoms (Beck, Steer & Brown, 1996).

2.3.2.7 Safety Maneuver Questionnaire (SMQ)

The SMQ (Appendix H) was initially administered as a measure of the use of safety behaviors at Time 1 and 2. At the time this study was designed it appeared that this measure indicate that was reliable and valid (Woolaway-Bickel et al., 2002). After subsequent study, the authors determined that the scoring of this measure was problematic and in need of further study thus the data from this measure were not included in the present paper.

2.3.2.8 Demographic Form

Clients completed a four-item demographic form (Appendix I) that includes age, gender, ethnicity, and employment status.

2.3.2.9 Symptom Monitoring Form
A symptom monitoring form (Appendix J) was adapted from the standard weekly monitoring form used in the ASDC at the time the study was designed. This measure was used to screen for drastic increases in anxiety or depression during the course of the treatment-monitoring period so that the lead investigator would be able to address these issues if they arise. Additionally, participants in the delayed treatment group completed these forms weekly, via postal mail, during the wait-list period.

2.3.3 Treatment-specific Measures

2.3.3.1 Technology Questionnaire (TQ)

A 6-item questionnaire (Appendix K) designed to assess a participant’s comfort with technology was administered before the treatment.

2.3.3.2 Pre- and post-treatment CALM Questionnaires

Participants completed two, 4-item questionnaires, before and after the experimental phase of the study (Appendix L and M), to assess their comfort with the CALM program.

2.3.3.3 Client Satisfaction Questionnaire (CSQ)

The CSQ (Appendix N; Larsen, Attkisson, Hargreaves & Nguyen, 1979) is an 8-item questionnaire with a 4-point Likert scale. This measure allows clients to express their satisfaction with the treatment and has room for written comments. This questionnaire was administered at post-treatment and was collected for future treatment development purposes.
2.3.3.4 Treatment Credibility and Expectancy Questionnaire (TCEQ)

A 4-item questionnaire (Appendix O) designed to assess the participants’ reaction to the treatment rationale and their expectations for the treatment, was administered after the second session in the immediate treatment group. This questionnaire was patterned after the Credibility/Expectancy Questionnaire used by Devilly & Borkovec (2000).

2.3.4 Compliance Ratings

Compliance ratings were completed by K.W.B. as described by Schmidt and Woolaway-Bickel (2000). Homework forms, completed by clients, were evaluated each week on the following quality assessment scale: 0 = poor, 1 = marginal, 2 = fair, 3 = good, 4 = very good, 5 = excellent. Reliability ratings using this method are typically high for both quantity and quality (Schmidt & Woolaway-Bickel, 2000). In previous studies using this measure, the therapist relied heavily on verbal reports in addition to completed homework forms to assign compliance ratings. Due to the nature of this study, verbal reports were unavailable. This made it difficult to obtain an accurate and detailed estimate of patient compliance. The quality of homework completed was rated either “fair” or “good” for all clients across sessions with little variability between or within groups. Therefore, the ratings of these forms were not used in subsequent analyses but may have served as an incentive for clients to complete their homework. Participant ratings of quantity and quality were not collected because these ratings have been shown to have little predictive utility or reliability (Schmidt & Woolaway-Bickel, 2000).

2.4 Power Analysis

An a priori power analysis, using Statistica, was conducted to determine the sample size to be used in this investigation. We expected that the present treatment
would be as effective as brief therapy with supplemental materials rather than other computer interventions due to the factors addressed in previous sections. An expected effect size of $d=1.25$, which was lower than the mean effect size for the brief therapy with supplemental materials for panic and agoraphobic symptoms ($d = 1.70$ and 1.74 respectively), was used for this estimate. This analysis indicated that a total sample size of 22 participants (11 per group) would be sufficient to test the above hypotheses as proposed below (power $> .80$).
CHAPTER 3

RESULTS

3.1 Preliminary Analyses

Prior to conducting outcome analyses, the data were examined to ensure that they met the assumptions for parametric tests. Self-reported panic frequency (from the Mobility Inventory) and credibility of the treatment/expectancies for recovery (CEQ) were skewed, violating the assumption of normality. In order to normalize the distributions, a logarithmic transformation was applied to all panic frequency scores and credibility/expectancy scores. The transformed data were used for all subsequent analyses. Prior to the logarithmic transformation of the credibility and expectancy scores, the scores were reflected because they were negatively skewed. Additionally, the variance in Credibility/Expectancy Questionnaire (CEQ) scores at Time 1 was significantly different for the treatment and waitlist groups (Levene’s F= 4.6). Thus, the earlier logarithmic transformation of these scores additionally served to reduce heteroscedasticity.

The Mobility Inventory (Accompanied and Alone) and the Fear Questionnaire provided a total of three subscales measuring agoraphobic symptoms. As these subscales were significantly correlated at each assessment (r = .55-.94), Time 1 and 2 composite agoraphobia subscales were constructed by standardizing each subscale and summing
them at each assessment interval. These agoraphobia composite scores were used for all subsequent analyses.

3.2 Attrition

Both groups appeared to have high attrition rates upon visual inspection (27% of the treatment group and 55% of the waitlist group dropped out prior to study completion). A chi-square analysis revealed a marginally significant difference in the rate of attrition between the two groups ($\chi^2(1, \ N = 22) = 2.93, \ p < .10$). Due to the negative impact of differential attrition on internal and external validity (Ribisl et al., 1996), we proceeded under the assumption that attrition was different between the two groups.

In an attempt to explain the differential attrition between the treatment groups, hierarchical regression analyses were conducted to assess the impact of Time 1 symptoms, demographic, and treatment-related variables on attrition. These analyses indicated that the majority of pretreatment indices did not significantly predict attrition. Gender and credibility of treatment/expectations for recovery were the only significant predictors of attrition. As these variables were not significantly correlated with each other ($r = 0.22, \ p > .05; \ n = 22$), another regression analysis was conducted using gender and credibility/expectancy as predictors of attrition. This combination of variables accounted for 46% of the variance in attrition ($F [2, 19] = 8.223, \ p < .01; \ R^2 = .46$) suggesting that these two variables were significant predictors of attrition but that a large percentage of the variance in attrition remained unexplained.

Independent t-tests were conducted to look for differences in symptom levels or demographic variables between the immediate and delayed treatment groups at Time 1. The groups did not significantly differ on any measure of pretreatment symptoms except
for fear of body sensations (BSQ; Table 2). Additionally, Pearson correlations revealed that Time 1 and 2 symptoms were not significantly correlated for any outcome measure except depression (BDI; Table 2). The correlation between the agoraphobic symptom composite index at Time 1 and 2 was marginally significant (Table 2).

3.3 Completer Analyses

We hypothesized that participants in the treatment group would show significantly greater improvement on all symptom measures and PD diagnosis from pre-to post-treatment (Time 1 to Time 2) than the control group. Despite the apparent equivalence of symptoms at Time 1 and the lack of correlation between most symptoms over time as described above, Analyses of Covariance (ANCOVAs) were conducted for each of the treatment outcome variables at Time 2, covarying Time 1 symptoms in order to examine symptom change.

One-way (group) ANCOVAs were conducted to test the hypothesis for each post-treatment symptom measure. Effect sizes and 95% confidence intervals for these effects were computed for each outcome measure by group (Cohen’s d). The results of these analyses are presented in Table 8. Participants in the treatment group reported significantly fewer panic attacks, fewer agoraphobic symptoms and less depression at Time 2 than the wait list group, when the variance due to Time 1 symptoms was removed. Differences between groups on changes in anxiety sensitivity were marginally significant. While the other analyses were nonsignificant, the effect sizes for the
Table 1- Hierarchical regression analyses and Independent t-tests at Time 1-

The differences between groups on demographic variables at Time 1.

<table>
<thead>
<tr>
<th>Pretreatment Index</th>
<th>Regression Analyses: predictor = pretreatment index; criterion= attrition</th>
<th>Independent t-tests (Chi-Square): Differences between groups at Time 1</th>
<th>Central Tendency&lt;sup&gt;1&lt;/sup&gt; (Variability)</th>
<th>t(df)/ β&lt;sup&gt;2&lt;/sup&gt; (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β*</td>
<td>R&lt;sup&gt;2&lt;/sup&gt;</td>
<td>F</td>
<td>Mode</td>
</tr>
<tr>
<td>Gender</td>
<td>-.47</td>
<td>.22</td>
<td>5.54&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Female = 8</td>
</tr>
<tr>
<td>Age</td>
<td>.14</td>
<td>.02</td>
<td>.40</td>
<td>40.67</td>
</tr>
<tr>
<td>Ethnicity (Caucasian = 20; Black = 1; Hispanic = 1)</td>
<td>.11-.23</td>
<td>.08</td>
<td>.86&lt;sup&gt;c&lt;/sup&gt;</td>
<td>Mode= Caucasian</td>
</tr>
<tr>
<td>Employment Status (Full-time=12; Unemployed = 2; Part-time = 3; Student = 1; Homemaker = 4)</td>
<td>-.30 -.14</td>
<td>.21</td>
<td>1.10</td>
<td>Mode= Full time</td>
</tr>
<tr>
<td>Medication Status - SSRI's (None = 14; SSRI = 8)</td>
<td>-.07</td>
<td>.01</td>
<td>.10</td>
<td>Mode = None</td>
</tr>
<tr>
<td>Medication Status - Benzodiazepines (None = 15; PRN = 7)</td>
<td>.23</td>
<td>.05</td>
<td>1.13</td>
<td>Mode = None</td>
</tr>
</tbody>
</table>

Notes: <sup>a</sup> df = (1, 20) unless otherwise noted; β* = standardized beta weights; <sup>b</sup> p<.05; <sup>c</sup> df = (4, 17); <sup>d</sup> df = (2, 19), <sup>e</sup> p<.001; <sup>f</sup> Means with standard deviations are presented for continuous variables and modes are presented for categorical variables; <sup>m</sup> p<.01; PRN = as needed; SSRI = Selective serotonin reuptake inhibitor.
Table 2- Hierarchical regression analyses and Independent t-tests at Time 1-
The differences between groups on symptom variables at Time 1.

<table>
<thead>
<tr>
<th>Pretreatment Index</th>
<th>Regression Analyses: predictor = pretreatment index; criterion= attrition</th>
<th>Independent t-tests (Chi-Square): Differences between groups at Time 1</th>
<th>Central Tendency (Variability)</th>
<th>t(df)</th>
<th>β²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β*</td>
<td>R²</td>
<td>F</td>
<td></td>
<td>Waitlist</td>
</tr>
<tr>
<td>Anxiety Sensitivity (Anxiety Sensitivity Index)</td>
<td>.18</td>
<td>.03</td>
<td>.68</td>
<td>34.64 (15.71)</td>
<td>30.73 (9.00)</td>
</tr>
<tr>
<td>Panic Frequency (Mobility Inventory)</td>
<td>-.37</td>
<td>.14</td>
<td>3.2m</td>
<td>3.90 (4.93)</td>
<td>2.77 (4.32)</td>
</tr>
<tr>
<td>Anxiety (Beck Anxiety Inventory)</td>
<td>-.03</td>
<td>.001</td>
<td>.02</td>
<td>22.63 (9.85)</td>
<td>18.82 (7.53)</td>
</tr>
<tr>
<td>Depression (Beck Depression Inventory II)</td>
<td>.20</td>
<td>.04</td>
<td>.84</td>
<td>19.00 (10.00)</td>
<td>16.46 (7.06)</td>
</tr>
<tr>
<td>Agoraphobia Composite Variable</td>
<td>.22</td>
<td>.05</td>
<td>1.05</td>
<td>3.91 (4.93)</td>
<td>2.77 (4.32)</td>
</tr>
<tr>
<td>Panic-related Cognitions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-ACQ</td>
<td>.14</td>
<td>.02</td>
<td>.38</td>
<td>2.34 (.91)</td>
<td>2.36 (.75)</td>
</tr>
<tr>
<td>-BSQ</td>
<td>.06</td>
<td>.004</td>
<td>.07</td>
<td>2.29 (.89)</td>
<td>3.47 (.52)</td>
</tr>
<tr>
<td>Primary Diagnosis (PD with or without Ag)</td>
<td>.15</td>
<td>.04</td>
<td>.78</td>
<td>Mode=PDA</td>
<td>Mode=PDA</td>
</tr>
<tr>
<td>Presence of Secondary Diagnosis</td>
<td>.15</td>
<td>.02</td>
<td>.46</td>
<td>Mode = None</td>
<td>Mode = None</td>
</tr>
</tbody>
</table>
Notes: \(^a\) df = (1, 20) unless otherwise noted; \(^b\) \(\beta^*\) = standardized beta weights; \(^c\) df = (4, 17); \(^d\) df = (2, 19); \(^e\) \(p < .001\); \(^f\) Means with standard deviations are presented for continuous variables and modes are presented for categorical variables; \(^m\) \(p < .01\); PRN = as needed; SSRI = Selective serotonin reuptake inhibitor. ACQ = Agoraphobia Cognitions Questionnaire; BSQ = Body Sensations Questionnaire

difference between groups was moderate to high for all measures except for agoraphobic cognitions (ACQ), which yielded a small effect size between the two groups.

3.4 Controlling for threats to internal validity

While we were able to identify gender and credibility/expectancy of treatment as contributors to differential attrition between groups, there was still a large portion of the variance in attrition that was unexplained. Since it is unlikely that the remaining variance was due to completely random factors (Ribisl et al., 1996), we chose to limit the threat to internal validity by examining a subset of the sample in which both members of the initial matched pairs, who were randomly assigned to groups, completed the study. This reduced sample was used for the remainder of the statistical analyses.

These pairs were matched on interviewer-rated, overall symptom severity and agoraphobic symptom severity at Time 1 and then each member of the matched pair was randomly assigned to a treatment group. The severity ratings were made on a scale that ranges from 1 to 7 (CGIS) but in our initial, full sample had a more limited range of 2 to 5. The reduced sample of five matched pairs used for the later analyses retained the same range of overall symptom severity. Agoraphobic symptom severity ratings were made using a scale that ranged from 0 to 4 (MC-PAS). The full and reduced samples both covered the full range of agoraphobic symptoms using this measure. A scatter plot of the
initial severity and agoraphobia ratings for the five matched pairs that were retained in the reduced sample are depicted in Figure 1.

As with the completer analysis, Pearson correlations were conducted to investigate the relation between symptom measures at Time 1 and 2. None of the symptoms correlated at Time 1 and 2. Again, despite the lack of correlation between Time 1 and 2 measures, ANCOVAs were conducted on symptoms at Time 2, covarying symptoms at Time 1, as a test of symptom change. The results of these analyses are presented in Table 5. Anxiety sensitivity, agoraphobic symptoms and depression remained significantly improved at Time 2 for the treatment group when compared to the

Figure 1- Initial agoraphobic symptom severity and overall symptom severity of the matched pairs in the reduced sample.

![Graph showing initial agoraphobic symptom severity and overall symptom severity of matched pairs.](image-url)
waitlist participants. The means\(^3\) for the two groups at each time period have been included in Figures 2a through 2h.

Table 3- Pearson Product Moment Correlations between Time 1 and 2 Symptoms for Completers (N=13) and matched pairs sample (N=10).

<table>
<thead>
<tr>
<th>Measure</th>
<th>Full sample Pearson Correlation (r)</th>
<th>Matched sample Pearson Correlation (r)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Time 1 and Time 2)</td>
<td>(Time 1 and Time 2)</td>
</tr>
<tr>
<td></td>
<td>N=13</td>
<td>N=10</td>
</tr>
<tr>
<td>Anxiety Sensitivity Index</td>
<td>.13</td>
<td>.03</td>
</tr>
<tr>
<td>Panic Frequency</td>
<td>.12</td>
<td>.36</td>
</tr>
<tr>
<td>Beck Anxiety Inventory</td>
<td>.35</td>
<td>.40</td>
</tr>
<tr>
<td>Beck Depression Inventory</td>
<td>.62*</td>
<td>.68*</td>
</tr>
<tr>
<td>Agoraphobia Composite</td>
<td>.53*</td>
<td>.44</td>
</tr>
<tr>
<td>Agoraphobic Cognitions Questionnaire</td>
<td>.16</td>
<td>.19</td>
</tr>
<tr>
<td>Body Sensations Questionnaire</td>
<td>.00</td>
<td>-.08</td>
</tr>
</tbody>
</table>

Note: * p<.05

\(^3\) Graphs of the three agoraphobia subscales that comprised the agoraphobia composite measure have been included for illustrative purposes.
Table 4: Completer Analysis: ANCOVAs of Symptoms at Time 2 Covarying Symptoms at Time 1

<table>
<thead>
<tr>
<th>Symptom Measure</th>
<th>Mean (SD) Treatment Group</th>
<th>Mean (SD) Waitlist Group</th>
<th>F</th>
<th>Effect Size d (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panic Attack Frequency (Number of PA’s in past week)</td>
<td>.50 (.84)</td>
<td>3.5 (2.65)</td>
<td>8.64*</td>
<td>1.73 (.31; 2.85)</td>
</tr>
<tr>
<td>Anxiety Sensitivity</td>
<td>14.00 (7.84)</td>
<td>38.00 (14.83)</td>
<td>4.94m</td>
<td>2.20 (.65; 3.37)</td>
</tr>
<tr>
<td>Agoraphobic Symptom Composite</td>
<td>-1.70 (1.29)</td>
<td>2.72 (2.43)</td>
<td>19.73**</td>
<td>2.46 (.84; 3.66)</td>
</tr>
<tr>
<td>Beck Anxiety Inventory</td>
<td>11.25 (9.07)</td>
<td>19.30 (14.76)</td>
<td>1.02</td>
<td>.70 (.50; 1.79)</td>
</tr>
<tr>
<td>Agoraphobic Cognitions Questionnaire</td>
<td>27.13 (7.30)</td>
<td>30.20 (9.04)</td>
<td>.37</td>
<td>.38 (-.77; 1.48)</td>
</tr>
<tr>
<td>Body Sensations Questionnaire</td>
<td>38.81 (19.59)</td>
<td>51.40 (18.47)</td>
<td>1.54</td>
<td>.66 (-.54; 1.74)</td>
</tr>
<tr>
<td>Beck Depression Inventory</td>
<td>4.38 (5.26)</td>
<td>23.00 (12.97)</td>
<td>9.34*</td>
<td>2.11 (.59; 3.27)</td>
</tr>
</tbody>
</table>

Notes: *p<.05; ** p<.01; m p<.01
### Table 5: Matched Pairs: ANCOVAs of Symptoms at Time 2 Covarying Symptoms at Time 1

<table>
<thead>
<tr>
<th>Symptom Measure</th>
<th>Mean (SD) Treatment Group</th>
<th>Mean (SD) Waitlist Group</th>
<th>F (df=1)</th>
<th>Effect Size d (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panic Attack Frequency (Number of PA’s in past week)</td>
<td>.75 (.96)⁹</td>
<td>3.5 (2.65)⁹</td>
<td>2.85</td>
<td>1.38 (-.31; 2.70)</td>
</tr>
<tr>
<td>Anxiety Sensitivity</td>
<td>14.00 (7.84)</td>
<td>38.00 (14.83)</td>
<td>14.00**</td>
<td>1.87 (.25, 3.13)</td>
</tr>
<tr>
<td>Agoraphobic Symptom Composite</td>
<td>-1.92 (1.03)</td>
<td>1.92 (2.59)</td>
<td>11.29*</td>
<td>1.95 (.30, 3.22)</td>
</tr>
<tr>
<td>Beck Anxiety Inventory</td>
<td>13.20 (10.13)</td>
<td>19.3 (14.76)</td>
<td>.31</td>
<td>.48 (-.82; 1.69)</td>
</tr>
<tr>
<td>Agoraphobic Cognitions Questionnaire</td>
<td>25.00 (7.31)</td>
<td>30.20 (9.04)</td>
<td>.99</td>
<td>.63 (-.69; 1.84)</td>
</tr>
<tr>
<td>Body Sensations Questionnaire</td>
<td>2.17 (.62)</td>
<td>2.35 (.89)</td>
<td>1.69</td>
<td>.23 (-1.03; 1.45)</td>
</tr>
<tr>
<td>Beck Depression Inventory</td>
<td>4.6 (4.98)</td>
<td>19.4 (8.44)</td>
<td>8.28*</td>
<td>1.85 (.25; 3.13)</td>
</tr>
</tbody>
</table>

Notes: ⁹ N= 4 for this cell; ** p<.01; *p<.05; ⁹ p<.01
Figure 2a: Mean scores on outcome measures at Time 1 and 2 for the matched sample- ASI.

![Bar graph showing Anxiety Sensitivity (ASI) scores for Treatment and Waitlist groups at Time 1 and Time 2. The graph indicates a significant difference (P<.05) between the groups at Time 2.]

Figure 2b: Mean scores on outcome measures at Time 1 and 2 for the matched sample- MI-Accompanied.

![Bar graph showing Agoraphobic Avoidance-When Accompanied scores for Treatment and Waitlist groups at Time 1 and Time 2. The graph shows a decrease in scores for both groups at Time 2.]

54
Figure 2c: Mean scores on outcome measures at Time 1 and 2 for the matched sample- ACQ.

![Graph showing mean scores on Panic-related Cognitions (ACQ) for Treatment and Waitlist at Time 1 and 2. The graph indicates a significant difference (P<.05) between the two groups at Time 2.]

Figure 2d: Mean scores on outcome measures at Time 1 and 2 for the matched sample- MI-Alone.

![Graph showing mean scores on Agoraphobic Avoidance-When Alone (MI) for Treatment and Waitlist at Time 1 and 2. The graph indicates a significant difference (P<.05) between the two groups at Time 2.]

55
Figure 2e: Mean scores on outcome measures at Time 1 and 2 for the matched sample- BSQ.

Figure 2f: Mean scores on outcome measures at Time 1 and 2 for the matched sample- BAI.
Figure 2g: Mean scores on outcome measures at Time 1 and 2 for the matched sample- BDI.

Figure 2h: Mean scores on outcome measures at Time 1 and 2 for the matched sample- FQ.
3.5 Diagnostic Change

In addition to symptom change on self-report measures, we predicted that more participants in the treatment group would show recovery from panic disorder over the course of the study than those in the delayed treatment group. Changes in primary and secondary diagnoses were examined for the two groups between Time 1 and 2. At Time 1, 18 of the participants met criteria for a diagnosis of panic disorder with agoraphobia, 10 of them were in the waitlist group and 8 in the treatment group. Four participants started the protocol with a diagnosis of panic disorder without agoraphobia. Three of these people were in the treatment group and one was in the waitlist group. Of the 13 participants who completed the protocol, two patients did not receive a panic disorder with or without agoraphobia diagnosis at Time 2. None of the participants in either group from the reduced sample (matched) evidenced a change in panic disorder diagnosis over the course of treatment.

At Time 1, six participants had at least one secondary Axis I diagnosis, five of them were in the waitlist group. A chi-square analysis, conducted to determine whether the difference in the presence of a secondary diagnosis was statistically different between the two groups, indicated a marginal effect ($\chi^2 (1,22) = 3.67; p<.01$). Secondary diagnostic status stayed the same for all retained participants from Time 1 to Time 2. These diagnoses included major depressive disorder (N=2), dysthymia (N=1), specific phobia (N=3), somatization disorder (N=1) and posttraumatic stress disorder (N=1).

3.6 Clinically Significant Change

We predicted that the change in symptoms made by participants in the treatment group would be clinically significant and would be reflected in intent-to-treat analyses. Once the data were collected, the planned intent-to-treat analyses were not conducted as the
differential attrition between the groups could not be reliably explained and was likely to have resulted in biased analyses (Ribisl et al., 1996). Cutoff scores indicating that participants were more functional than dysfunctional were calculated (Criterion c; Jacobson & Truax, 1991). The percentage of participants in the treatment and waitlist groups at Time 1 and 2 for each of the dependent measures whose symptoms were lower than this cutoff are presented in Figures 3a through 3h.

For each dependent measure, the group that received immediate treatment showed a greater percentage of patients in the functional range of symptoms at Time 2. Additionally, there was an increase in the number of participants who achieved functional symptom levels from Time 1 to Time 2 in the treatment group. In contrast, the percentage of participants in the waitlist group who were at a functional symptom level decreased for a number of variables across the intervention phase of the study.

Figures 3a-3h - Percentages of patients who met criteria for clinically significant change at Time 1 and Time 2
Agoraphobia (MI-accompanied)

Agoraphobia (FQ)

General Anxiety (BAI)

Panic-related Cognitions (ACQ)
3.7 Reliable Change in Symptoms

A Reliable Change Index (Jacobson & Truax, 1991) was calculated for each participant and expressed in terms of the percentage of patients who evidenced reliable change in anxiety sensitivity and depression4. Only 10% (N=1; RCI = -2.35) of the participants in the treatment group showed reliable change in anxiety sensitivity and 10% (N=1; RCI = -2.90) in depression at Time 2. None of the participants in the waitlist group evidenced reliable change from Time 1 to Time 2.

3.8 Individual Symptom Change

While formal analyses of symptoms regularly assessed during the baseline and intervention phases were not planned nor conducted, we have included figures depicting

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4 These two measures were used because the previous ANCOVAs indicated a statistically significant difference between the treatment groups. The agoraphobia scores were not used because norms were not available for this composite measure.
change in panic attack frequency, anxiety, depression and other panic-related indices for each matched pair in the reduced sample (Appendix P). We expected that symptoms would stabilize during the baseline period for both groups. Additionally, we predicted that the treatment group would show a gradual reduction of symptoms over time, yielding a graphical pattern similar to a habituation curve, while the waitlist group would remain at or around the baseline level of symptoms across time. The data depicted in Appendix P do not match these predictions.

The most notable observation is that scores are highly variable across both the baseline and intervention phases for the majority of the measures and the majority of participants. In general, there is a pattern whereby participants in the treatment group show a greater downward trend in symptoms from the beginning to the end of the intervention phase than the waitlist group. Yet, this is not consistent for all treatment participants. Worry, including worry about future panic attacks, worry about the consequences of panic and worry about bodily sensations, appears to fit the predicted pattern more closely than the other symptom measures although again, there are a number of exceptions.

3.9 Satisfaction with Treatment

Mean satisfaction with treatment scores were computed for each item on the CSQ for participants in the treatment group. We predicted that patients who received treatment would be generally satisfied with the intervention represented by a modal score of 3 or greater (scale ranges from 1 to 4) on each item of the CSQ. The mean scores for each item on the CSQ ranged from 3.5 to 3.9, indicating that participants who completed the treatment were moderately to highly satisfied with the program.

4.0 Preference for CALM vs. Therapist-delivered Treatment
At Time 2, eight participants completed the post-treatment CALM questionnaire. Dependent t-tests\textsuperscript{5} were conducted to look for changes in preference for therapist-delivered vs. computer treatment from Time 1 to Time 2. Despite the small sample included in this analysis, participants who completed the treatment protocol evidenced a significant increase in the likelihood of selecting CALM as opposed to therapist-delivered treatment from Time 1 to Time 2 (t (7) = 2.34, p<.05).

\textsuperscript{5} Scores were dummy coded for this analysis.
The present study provided a preliminary test of the efficacy of CALM, a computer-administered learning module, to treat panic disorder. It was predicted that CALM would lead to symptom reduction and diagnostic change for participants with a primary diagnosis of panic disorder in comparison to a delayed treatment group. The findings indicate that the intervention resulted in improvement on a number of self-reported symptom measures, although symptom change was not reflected in the elimination of panic disorder for the majority of participants during the 6-week intervention period. Additionally, this study provided a demonstration of the utility of the intervention in an outpatient clinic setting. While the intervention was rated as highly palatable by participants who completed the treatment, there was more attrition than expected in both groups. The rate of attrition appeared higher in the delayed treatment group indicating that the use of CALM as an intervention following a delayed treatment may be problematic.

CALM led to a significant reduction in critical panic-related symptoms. Participants in the immediate treatment group showed a significant reduction in panic frequency, agoraphobic symptoms, anxiety sensitivity, and depression across the intervention period when compared to the control group. The evidence of these treatment gains persisted when sample size was reduced to improve internal validity for all but panic frequency. An examination of the
strength of the intervention (effect sizes) on self-reported symptoms indicates that the treatment had a strong effect on the primary panic-related symptoms (panic frequency, agoraphobic symptoms and anxiety sensitivity) as well as depression. Between-subject effect sizes (Cohen’s d) ranged from 1.38 to 1.95 in the present study. These effects are visibly higher than, or at least comparable to, the similarly calculated effects of standard length, therapist-administered treatments for panic disorder (mean between-subjects d = .8; Westen & Morrison, 2001). Additionally, CALM had a mild to moderate effect on all other panic-related symptoms although the effects were not statistically significant.

Despite the apparent reduction of symptoms in the immediate treatment group, only a couple of the participants recovered from panic disorder during the intervention period. Why is there this discrepancy between symptom-reduction and diagnostic status? One possibility is that while participants improved from pre- to post-treatment, the six week assessment interval was too short for diagnostic change to occur. This hypothesis was supported by informal interviews conducted with the majority of clients approximately 1-month after the completion of treatment. Most of the clients that we interviewed reported continued treatment gains and the complete remission of panic disorder during the intervening period. Another possible explanation for the discrepancy between self-reported symptoms and diagnostic status in the immediate treatment group is that participants were attempting to please the experimenter by reporting a remission of symptoms on the self-report measures. Yet, if this were the case, one would expect a parallel effect on the posttreatment diagnostic interviews. It is more likely that panic disorder was overdiagnosed by the interviewers, despite their extensive training, as structured clinical interviews are known to lead to inflated rates of Axis I diagnoses.
An examination of the time series data for the individual participants yields other questions about the change in symptoms across the intervention period. While we predicted that symptoms would gradually decrease for the immediate treatment group over the course of treatment, these ratings were highly variable and did not show the predicted pattern in many cases. One possible explanation for this lack of continuity is that the short-interval between assessments, a day for the baseline period and a few days for the intervention phase, was more sensitive to change and thus resulted in greater variability across time. Another potential explanation is that the self-report measure used for the between-session assessment is unreliable and invalid. It may be that the use of psychometrically proven measures would be advantageous in future studies despite the obvious problems with such an approach (e.g., more time needed for assessments; practice effects).

While this study yielded some interesting findings, this investigation had a number of limitations. The most critical issue was the high and differential rate of attrition between groups. The dropout rates of the self-help (bibliotherapy) interventions previously described ranged from 0% to 38%, while the present study dropout rates were 27% in the treatment group and 55% in the waitlisted group. This is especially notable because one of the goals of the present study was to produce a more engaging, palatable intervention to improve the rate of retention. One plausible explanation for the high, differential attrition rate was that at the time of recruitment, our clinic was in a transition phase and therapist-administered treatment was not available. Subsequent to the initiation of the study, therapists became available in our clinic and clients in both groups were alerted to this development for ethical reasons. It may be that clients were willing to participate in a self-help intervention, and a 50% chance in being randomly assigned to a delayed treatment condition, when other alternatives were not available. The differential rate of attrition may also be explained by participants who
began the study with the intention of seeking other treatment alternatives if they were
subsequently randomly assigned to a 5-week delay. This hypothesis is supported by the fact
that all but one of the participants who dropped out of the delayed treatment group did so in
the two weeks prior to being alerted to their group assignment. The groups may have also
had a differential rate of attrition because participants were willing to try a novel treatment
approach if they could begin immediately but were unwilling to wait over a month before
beginning such an approach.

The high rate of attrition jeopardizes the internal and external validity of the present findings.
In order to control for threats to internal validity, we reduced our sample, and subsequently
our statistical power, by retaining only those participants from matched pairs in which both
members completed the study protocol. Unfortunately, this further limited the external
validity of the study. We can only predict that CALM may be effective for participants
similar to those who completed the study, specifically, highly motivated individuals.

The obvious way to improve external validity and statistical power in the present
investigation would be to continue to recruit participants for the study and collect more data.
Unfortunately, it is not ethical given to continue the treatment study in its present incarnation
given the current availability of therapist-delivered treatment options in our clinic.

Withholding treatment from people when effective treatments are available is unethical
(Elliott & Brow, 2002). The use of a delayed treatment control group was ethically justified
when this study was implemented because other treatment alternatives were not available.
Once effective, proven treatments were available, we were ethically obligated to offer these
services to clients. As was described above, this most likely contributed to our high attrition
rate.
Fortunately, despite the limited external validity of the present findings, the collection of further data is not necessary. The current study was designed to provide a pilot test for the first version of CALM. The data collected to date addresses CALM’s efficacy adequately enough to conclude that CALM, and other future computer-based self-help interventions, are worth revising, developing and testing. The next step in validating CALM is to conduct a larger treatment outcome study with a standard treatment control group to compare the efficacy of CALM to the most effective treatment available for panic disorder. The success of CALM in the present study provides a justification for a larger investigation as well as some insight into potential problems that could hinder future endeavors.
REFERENCES


Dell.com; price quote obtained on June 29, 2002 from [www.dell.com](http://www.dell.com).


73


APPENDIX A

BECK ANXIETY INVENTORY

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by each symptom during the PAST WEEK, INCLUDING TODAY, by placing an X in the corresponding space in the column next to each symptom.

<table>
<thead>
<tr>
<th>Not at all</th>
<th>Mildly: It did not bother me much</th>
<th>Moderately: It was very unpleasant, but I could stand it</th>
<th>Severely: I could barely stand it</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Numbness or tingling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Feeling hot</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Wobbliness in legs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Unable to relax</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Fear of the worst happening</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Dizzy or lightheaded</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Heart pounding or racing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Unsteady</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Terrified</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Nervous</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Feelings of choking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Hands trembling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Shaky</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Fear of losing control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Difficulty breathing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Fear of dying</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Scared</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Indigestion or abdominal discomfort</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Faint</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Face flushed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Sweating (not due to heat)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FEAR QUESTIONNAIRE-AGORAPHOBIA SUBSCALE

Choose a number from the scale below to show how much you would avoid each of the situations listed below because of fear or other unpleasant feelings. Then write the number you chose on the line beside each situation.

0--------1------------2----------3-----------4------------5-----------6-----------7------------8
Would not        Slightly  Definitely      Markedly               Always
avoid it        avoid it               avoid it           avoid it                   avoid it

1. Traveling alone by bus or coach ________
2. Walking alone in busy streets ________
3. Going into crowded shops ________
4. Going alone far from home ________
5. Large open spaces ________
BODY SENSATIONS QUESTIONNAIRE

Please indicate the degree to which you find the following body sensations distressing when you are anxious. Rate the degree to which these feelings are troubling using the following scale.

1    =    Not frightened or worried by this sensation
2    =    Rarely frightened or worried by this sensation.
3    =    Frightened by this sensation about half the time.
4    =    Frightened by this sensation most of the time.
5    =    Extremely frightened by this sensation.

You may use numbers halfway between this list when you think it is appropriate. For example, 3 ½ or 4 ½. Write your score in the blank next to each thought.

1. Heart palpitations ________
2. Pressure in chest ________
3. Numbness in arms or legs ________
4. Tingling in fingertips ________
5. Numbness in another part of your body ________
6. Feeling short of breath ________
7. Dizziness ________
8. Blurred or distorted vision ________
9. Nausea ________
10. Butterflies in stomach ________
11. Knot in stomach ________
12. Lump in throat ________
13. Wobble or rubber legs ________
14. Sweating ________
15. Dry throat ________
16. Feeling disoriented and confused ________
17. Feeling disconnected from your body only partly present ________
AGORAPHOBIC COGNITIONS QUESTIONNAIRE

Please indicate the degree to which the following thoughts occur to you when you are anxious. Rate the frequency of these thoughts using the following scale:

1 = Thought never occurs  
2 = Thought rarely occurs  
3 = Thought occurs half the time  
4 = Thought occurs most of the time  
5 = Thought always occurs

You may use a number halfway between this list when you think it is appropriate. For example, 3½ or 4½. Write you score in the blank next to each thought.

Thoughts

1. I am going to throw up __________
2. I am going to pass out __________
3. I must have a brain tumor __________
4. I will have a heart attack __________
5. I will choke to death __________
6. I am going to act foolish __________
7. I am going blind __________
8. I will not be able to control myself __________
9. I will hurt someone __________
10. I am going to have a stroke __________
11. I am going to go crazy __________
12. I am going to scream __________
13. I am going to babble or talk funny __________
14. I will be paralyzed by fear __________
APPENDIX E

ANXIETY SENSITIVITY INDEX

INSTRUCTIONS: Circle the one phrase that best represents the extent to which you agree with the item. If any of the items concern something that is not part of your experience (e.g., "it scares me when I feel shaky" for someone who has never trembled or had the "shakes"), answer on the basis of how you think you might feel if you had such an experience. Otherwise, answer all items on the basis of your own experience.

1. It is important to me not to appear nervous.

   VERY LITTLE   A LITTLE   SOME     MUCH     VERY MUCH

2. When I cannot keep my mind on a task, I worry that I might be going crazy.

   VERY LITTLE   A LITTLE   SOME     MUCH     VERY MUCH

3. It scares me when I feel 'shaky' (trembling).

   VERY LITTLE   A LITTLE   SOME     MUCH     VERY MUCH

4. It scares me when I feel faint.

   VERY LITTLE   A LITTLE   SOME     MUCH     VERY MUCH

5. It is important to me to stay in control of my emotions.

   VERY LITTLE   A LITTLE   SOME     MUCH     VERY MUCH

6. It scares me when my heart beats rapidly.

   VERY LITTLE   A LITTLE   SOME     MUCH     VERY MUCH
7. It embarrasses me when my stomach growls.

VERY LITTLE    A LITTLE    SOME    MUCH    VERY MUCH

8. It scares me when I am nauseous.

VERY LITTLE    A LITTLE    SOME    MUCH    VERY MUCH

9. When I notice that my heart is beating rapidly, I worry that I might have a heart attack.

VERY LITTLE    A LITTLE    SOME    MUCH    VERY MUCH

10. It scares me when I become short of breath.

VERY LITTLE    A LITTLE    SOME    MUCH    VERY MUCH

11. When my stomach is upset, I worry that I might be seriously ill.

VERY LITTLE    A LITTLE    SOME    MUCH    VERY MUCH

12. It scares me when I am unable to keep my mind on a task.

VERY LITTLE    A LITTLE    SOME    MUCH    VERY MUCH

13. Other people notice when I feel shaky.

VERY LITTLE    A LITTLE    SOME    MUCH    VERY MUCH

14. Unusual body sensations scare me.

VERY LITTLE    A LITTLE    SOME    MUCH    VERY MUCH

15. When I am nervous, I worry that I might be mentally ill.

VERY LITTLE    A LITTLE    SOME    MUCH    VERY MUCH

16. It scares me when I am nervous.

VERY LITTLE    A LITTLE    SOME    MUCH    VERY MUCH
APPENDIX F

BECK DEPRESSION INVENTORY II

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

<table>
<thead>
<tr>
<th>1. Sadness</th>
<th>3. Past Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0 I do not feel like a failure.</td>
</tr>
<tr>
<td>1</td>
<td>1 I have failed more than I should have.</td>
</tr>
<tr>
<td>2</td>
<td>2 As I look back, I see a lot of failures.</td>
</tr>
<tr>
<td>3</td>
<td>3 I feel I am a total failure as a person.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Pessimism</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Loss of Pleasure</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
</tbody>
</table>
5. **Guilty Feelings**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I don’t feel particularly guilty.</td>
</tr>
<tr>
<td>1</td>
<td>I feel guilty over many things I have done or should have done.</td>
</tr>
<tr>
<td>2</td>
<td>I feel quite guilty most of the time.</td>
</tr>
<tr>
<td>3</td>
<td>I feel guilty all of the time.</td>
</tr>
</tbody>
</table>

9. **Suicidal Thoughts or Wishes**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I don’t have any thoughts of killing myself.</td>
</tr>
<tr>
<td>1</td>
<td>I have thoughts of killing myself, but I would not carry them out.</td>
</tr>
<tr>
<td>2</td>
<td>I would like to kill myself.</td>
</tr>
<tr>
<td>3</td>
<td>I would kill myself if I had the chance.</td>
</tr>
</tbody>
</table>

6. **Punishment Feelings**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I don’t feel I am being punished.</td>
</tr>
<tr>
<td>1</td>
<td>I feel I may be punished.</td>
</tr>
<tr>
<td>2</td>
<td>I expect to be punished.</td>
</tr>
<tr>
<td>3</td>
<td>I feel I am being punished.</td>
</tr>
</tbody>
</table>

10. **Crying**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I don’t cry anymore than I used to.</td>
</tr>
<tr>
<td>1</td>
<td>I cry more than I used to.</td>
</tr>
<tr>
<td>2</td>
<td>I cry over every little thing.</td>
</tr>
<tr>
<td>3</td>
<td>I feel like crying, but I can’t.</td>
</tr>
</tbody>
</table>

7. **Self-Dislike**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I feel the same about myself as ever.</td>
</tr>
<tr>
<td>1</td>
<td>I have lost confidence in myself.</td>
</tr>
<tr>
<td>2</td>
<td>I am disappointed in myself.</td>
</tr>
<tr>
<td>3</td>
<td>I dislike myself.</td>
</tr>
</tbody>
</table>

11. **Agitation**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I am no more restless or wound up than usual.</td>
</tr>
<tr>
<td>1</td>
<td>I feel more restless or wound up than usual.</td>
</tr>
<tr>
<td>2</td>
<td>I am so restless or agitated that it’s hard to stay still.</td>
</tr>
<tr>
<td>3</td>
<td>I am so restless or agitated that I have to keep moving or doing something.</td>
</tr>
</tbody>
</table>

8. **Self-Criticism**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I don’t criticize or blame myself more than usual.</td>
</tr>
<tr>
<td>1</td>
<td>I am more critical of myself than I used to be.</td>
</tr>
<tr>
<td>2</td>
<td>I criticize myself for all of my faults.</td>
</tr>
<tr>
<td>3</td>
<td>I blame myself for everything bad that happens.</td>
</tr>
</tbody>
</table>

12. **Loss of Interest**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I have not lost interest in other people or activities.</td>
</tr>
<tr>
<td>1</td>
<td>I am less interested in other people or things than before.</td>
</tr>
<tr>
<td>2</td>
<td>I have lost most of my interest in other people or things.</td>
</tr>
<tr>
<td>3</td>
<td>It’s hard to get interested in anything.</td>
</tr>
</tbody>
</table>
13. **Indecisiveness**

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

14. **Worthlessness**

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

15. **Loss of Energy**

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

16. **Changes in Sleeping Pattern**

0  I have not experienced any change in my sleeping pattern.
1a.  I sleep somewhat more than usual.
1b.  I sleep somewhat less than usual.
2a.  I sleep a lot more than usual.
2b.  I sleep a lot less than usual.
3a.  I sleep most of the day.
3b.  I wake up 1-2 hours early and can’t get back to sleep.

17. **Irritability**

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

18. **Changes in Appetite**

0  I have not experienced any change in my appetite.
1a.  My appetite is somewhat less than usual.
1b.  My appetite is somewhat greater than usual.
2a.  My appetite is much less than before.
2b.  My appetite is much greater than usual.
3a.  I have no appetite at all.
3b.  I crave food all the time.

19. **Concentration Difficulty**

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

20. **Tiredness or Fatigue**

0  I am no more tired or fatigued than usual.
1  I get more tired or fatigued more easily than usual.
2  I am too tired or fatigued to do a lot of the things I used to do.
3  I am too tired or fatigued to do most of the things I used to do.
21. **Loss of Interest in Sex**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I have not noticed any recent change in my interest in sex.</td>
</tr>
<tr>
<td>1</td>
<td>I am less interested in sex than I used to be.</td>
</tr>
<tr>
<td>2</td>
<td>I am much less interested in sex now.</td>
</tr>
<tr>
<td>3</td>
<td>I have lost interest in sex completely.</td>
</tr>
</tbody>
</table>
SAFETY MANEUVERS QUESTIONNAIRE – REVISED (SMQ-R)

**Instructions:** Listed below are strategies that people sometimes use to *manage or avoid* fear and its consequences. They are also things that people do in general as part of their lifestyle and *not* to manage or avoid fear. Read each item carefully, and use the following 0 to 100 percent scale to rate how often you do the following things in general, and how often you’ve used each strategy since you began having problems with fear.

<table>
<thead>
<tr>
<th>Frequency of doing this in general</th>
<th>Frequency of doing this to manage or avoid fear</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-------------------</td>
<td>25-----------------------------</td>
</tr>
<tr>
<td>Never</td>
<td>Rarely</td>
</tr>
<tr>
<td>Always</td>
<td></td>
</tr>
</tbody>
</table>

1. Carrying food in car or on your person
2. Carrying water in car or on your person
3. Carrying alcohol or medications in car or on your person
4. Carrying vital telephone #'s in car or on your person
5. Having a phone or CB radio in your car
6. Taking vitamins regularly
7. Restricting diet to specific foods
8. Relying on a companion for travel
9. Relying on a companion for shopping
10. Relying on a companion for attending social gatherings
11. Relying on a companion to eat in restaurants
12. Singing to yourself
13. Thinking positively about yourself
14. Stiffening muscles
15. Gripping an object tightly
16. Listening to music
17. Reading
18. Watching television
19. Using mental distraction (e.g., using thoughts or images)
20. Staying busy
21. Conversing with others
22. Checking already-completed tasks
23. Checking the presence/location of phones
24. Checking the presence/location of bathrooms
25. Checking the presence/location of exits
26. Checking the presence/location of hospitals or medical emergency centers
27. Checking pulse, breathing, blood pressure
28. Avoiding stressful encounters
29. Avoiding anger-provoking situations
30. Avoiding eating in front of others
31. Avoiding emotionally-arousing events (e.g., concerts, sporting events)
32. Avoiding emotionally-arousing films
33. Avoiding stress at work or at school
34. Avoiding large and very small risks
35. Avoiding saunas, jacuzzis, hot showers
36. Avoiding drinks containing caffeine
37. Avoiding vigorous exercise
38. Avoiding eye contact with others
39. Avoiding speaking about yourself with others
40. Avoiding tight-fitting clothing
41. Avoiding specific foods or getting too full
42. Avoiding Merry-Go-Rounds or other amusement park rides that might make you dizzy
43. Avoiding alcohol
44. Drinking alcohol
45. Avoiding crowded stores
46. Avoiding driving on busy freeways
47. Avoiding using public transportation (e.g., buses, trains, or planes)
48. Avoiding parties or other social activities
49. Avoiding long lines (e.g., bank, DPS)
50. Avoiding sit-down meals at formal restaurants
51. Avoiding staying home alone
52. Avoiding being far from home
53. Attending social events only if you have been specifically invited (even if they are open events)
54. Attending a social event only if you know most of the people who will attend
55. Setting up “rescue” signals with friends to get you out of uncomfortable conversations
56. Going into an empty room
57. Avoiding crowds
58. Being the bartender
59. Being the DJ
60. Dancing
61. Pretending to sleep/ falling asleep
62. Looking busy (e.g., reading a CD cover)
63. Other: ___________________________________
64. Other: ___________________________________
65. Other: ___________________________________
APPENDIX H

DEMOGRAPHIC INFORMATION

Age: _____________
Gender: _____________
Ethnicity __________________
Employment Status (please circle):

Employed F/T   Employed P/T
Homemaker      Student      Unemployed
APPENDIX I

WEEKLY MONITORING FORM

Name: ___________________ Date:_______________ Session #: _____

Please complete the following based on the past week.

1. Number of full-symptom panic attacks (4+ symptoms): _________
2. Number of limited-symptom panic attacks (1-3 symptoms): ________

Please use this scale for the following questions:

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/ Extreme/ Never</td>
<td>Mild/</td>
<td>Moderate/</td>
<td>Severe/</td>
<td>Rarely</td>
<td>Frequently</td>
<td>Very Frequently</td>
<td>Always</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. What was your average level of anxiety? ________
4. What was your average level of depression? ________
5. What was your average level of worry about having more panic attacks?_______
6. What was your average level of worry about the consequences of having a panic attack (i.e., worried about something bad happening because of panic)? ________
7. How much has panic, or worry about panic, created some disruption (e.g., change in your behavior)? ________
8. How frequently have you worried about bodily sensations? ________
9. How frequently have you avoided situations in order to cope with or prevent anxiety? ________
10. How frequently have your avoided body sensations in order to cope with or prevent anxiety? ________
11. How frequently have you used the presence or avoidance of companions to cope with or prevent anxiety? ________

12. How frequently have you used medication or alcohol to cope with or prevent anxiety? ________

13. How frequently have you used other strategies not mentioned above (e.g., distraction) to cope with or prevent anxiety? ________
APPENDIX J

TECHNOLOGY QUESTIONNAIRE

1. Do you have a desktop computer or laptop at your home (circle response)?
   - Yes
   - No

2. Do you have access to a computer at work (circle response)?
   - Yes
   - No

3. Do you own a Palm or PDA (circle response)?
   - Yes
   - No

4. Do you have home access to the Internet (circle response)?
   - Yes
   - No

5. On average, how many hours a day do you use a computer (circle # of hours)?
   - 0
   - 1
   - 2
   - 3
   - 4
   - 5
   - 6
   - 7
   - 8
   - 9
   - 10+

6. How comfortable do you feel using a computer (circle response)?
   - 0
   - 1
   - 2
   - 3
   - 4
   - 5
   - 6
   - 7
   - 8
   - 9
   - 10
   - Not at all comfortable
   - Moderately comfortable
   - Extremely comfortable
APPENDIX K

PRE-TREATMENT CALM QUESTIONNAIRE

1. How comfortable are you with the idea of completing a computer-based treatment (circle)?
   
   0 1 2 3 4 5 6 7 8 9 10
   Not at all comfortable  Moderately comfortable  Extremely comfortable

2. How useful do you think CALM will be in helping you conquer panic disorder (circle)?
   
   0 1 2 3 4 5 6 7 8 9 10
   Not at all useful  Moderately useful  Extremely useful

3. Which type of treatment would be most comfortable for you in general (circle)?
   
   Computer-based treatment  Live therapist-administered treatment

4. If you have any concerns about beginning a computer-based treatment, please write them below.
APPENDIX L

POST-TREATMENT CALM QUESTIONNAIRE

5. How comfortable were you with CALM by the end of treatment (circle)?

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<tr>
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<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all comfortable</td>
<td>Moderately comfortable</td>
<td>Extremely comfortable</td>
<td></td>
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6. How would you rate CALM as a treatment for panic disorder (circle)?

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<th>4</th>
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<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all useful</td>
<td>Moderately useful</td>
<td>Extremely useful</td>
<td></td>
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7. Knowing what you do about CALM, if you had to select a treatment for panic disorder, which would you choose (circle)?

CALM Live therapist

8. We want to improve CALM. We would appreciate your feedback on the treatment. Please write any comments below.
APPENDIX M

THE CLIENT SATISFACTION QUESTIONNAIRE (CSQ)

Please help us improve our program by answering some questions about the services you have received at our clinic. We are interested in your honest opinions, whether they are positive or negative. Please answer all of the questions. We also welcome your comments and suggestions. Thank you very much, we appreciate your help.

PLEASE CIRCLE YOUR ANSWER:

1. How would you rate the quality of service you received?
   
   4   3   2   1
   Excellent         Good          Fair            Poor

2. Did you get the kind of service you wanted?
   
   1   2   3   4
   No, definitely not         No, not really      Yes, generally     Yes, definitely

3. To what extent has our program met your needs?
   
   4   3   2   1
   Almost all of my needs have been met          Most of my needs have been met   Only a few of my needs have been met   None of my needs have been met

4. If a friend were in need of similar help, would you recommend our program to him/her?
   
   1   2   3
   No, definitely not         No, not really      Yes, generally     Yes, definitely

5. How satisfied are you with the amount of help you received?
   
   1   2   3   4
   Quite dissatisfied          Indifferent or mildly satisfied   Mostly satisfied                  Very satisfied

6. Have the services you received helped you to deal more effectively with your problems?
   
   4   3   2   1
   Yes, they helped a great deal         Yes, they helped somewhat   No, they really didn’t help   No, they seemed to make things worse
7. In an overall, general sense, how satisfied are you with the service you received?

4 3 2 1
Very satisfied Mostly satisfied Indifferent or mildly satisfied Quite dissatisfied

8. If you were to seek help again, would you come back to our program?

1 2 3 4
No, definitely not No, I don't think so Yes, I think so Yes, definitely

9. Please write comments below.
APPENDIX N

CREDIBILITY AND EXPECTANCY QUESTIONNAIRE

We would like you to indicate below how much you believe, right now, that the therapy you are receiving will help to reduce your anxiety. Please answer the questions below by circling your responses.

1. At this point, how logical does the therapy offered to you seem?
   1  2  3  4  5  6  7  8  9  10
   not at all logical  somewhat logical  very logical

2. At this point, how successful do you think this treatment will be in reducing your symptoms?
   1  2  3  4  5  6  7  8  9  10
   not at all useful  somewhat useful  very useful

3. How confident would you be in recommending this treatment to a friend who experiences similar problems?
   1  2  3  4  5  6  7  8  9  10
   not at all confident  somewhat confident  very confident

4. By the end of the therapy period, how much improvement in your symptoms do you think will occur?
   0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%