

Behavioral Activation in the Treatment of Comorbid Posttraumatic Stress Disorder and Major Depressive Disorder

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Abstract

This study investigated the efficacy of 10-weeks of Behavioral Activation (BA) in the treatment of co-morbid Post-traumatic Stress Disorder (PTSD) and Major Depressive Disorder (MDD) in four adults using a nonconcurrent multiple baseline across participants design. All participants met full *DSM-IV* criteria for both MDD and PTSD at the outset of the study. Self-report data were gathered at each session and again at mid-point between each session. At the post-treatment assessment sessions, two participants no longer met diagnostic criteria for either MDD or PTSD and an additional participant no longer met criteria for MDD. It is argued that BA may be an effective treatment for co-morbid PTSD and MDD and the theoretical rationale is provided.

Keywords: PTSD, Depression, Co-morbidity, Behavioral Activation

Introduction

The last decade has seen resurgence in the empirical examination of behavior therapies (Hayes, Masuda, Bissett, Luoma, & Guerrero, 2004). Treatment development and intervention research has focused on incorporating contemporary understanding of behavioral theories with the knowledge generated by seminal behavior therapy research of the 1970's. One result has been the development of and empirical support for two variants of behavioral activation: Behavioral Activation (BA; Martell, Addis, & Jacobson, 2001) and Brief Behavioral Activation for Depression (BADT; Lejuez, Hopko, & Hopko, 2001). These approaches share foundational techniques functionally defined as helping clients identify, access, and maintain contact with sources of positive reinforcement based on their goals and values. Both interventions have demonstrated effectiveness with a variety of psychiatric conditions (Cuijpers, van Straten, & Warmerdam, 2007; Ekers, Richards, & Gilbody, 2008; Hopko, Lejuez, Ruggiero, & Eifert, 2003). However, BA and BADT were developed independently and have different origins. Behavioral activation has its genesis in the contextual behavioral theory, while BADT originates from matching law theory (see Hopko et al., 2003 for detailed analysis of differences and similarities).

For the purpose of exploring the mechanism of action of Cognitive Therapy for depression (CT; Beck, Rush, Shaw, & Emery, 1979), Jacobson and colleagues (1996) conducted a component analysis of the intervention. Their research provided evidence that BA, the behavioral component of CT, was as effective at reducing depressive symptomatology as the full CT intervention, and results were maintained over a two-year follow up (Gortner, Gollan, Dobson, & Jacobson, 1998). These results called into question the need for explicit cognitive interventions when treating depression and led to a number of studies that have more thoroughly examined the effectiveness of BA as a stand-alone treatment. In an effort to replicate and extend the original findings, Dimidjian and colleagues (2004) conducted a study comparing BA, CT, paroxetine (Paxil) with clinical management, and pill placebo in the treatment of depression. The results indicated that BA and paroxetine were comparable in their effectiveness and that both outperformed CT and pill placebo.

As the clinical utility of BA has emerged, the authors of this early research have clarified the theoretical underpinnings of the intervention (Jacobson, Martell, & Dimidjian, 2001; Martell et al., 2001) by incorporating Ferster's (1973) theory of depression. In this theory it is assessment of the function of behavior, rather than form, which is important in facilitating clinical change. The modern theory of BA demands that clinician and client collaboratively conduct a descriptive functional analysis of the client behavior and develop a treatment plan focused on addressing client avoidance behavior in an attempt to assist him or her to engage in more active behaviors. An increase in active behaviors enables the client to come into increased contact with available reinforcers in his or her environment. As told to clients, it is not a matter of doing things when you feel like it. Rather, it is engaging in activity because the behavior will help you to accomplish goals you have set that are consistent with one's life values and elicit reinforcement (Martell et al., 2001).

As BA has become more established as a treatment for depression, questions of its effectiveness with other psychiatric and medical populations have emerged. Those suffering from Post-traumatic Stress Disorder (PTSD) and Major Depressive Disorder (MDD) are one such population. The co-morbidity of PTSD and MDD (C-P/D) has been extensively examined and research has demonstrated co-occurrence rates exceeding that which would be expected as simple coincidence (Blanchard, Buckley, Hickling, & Taylor, 1998; Bleich, Koslowsky, Dovlev, & Lerer, 1997; Dow & Kline, 1997; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Kessler and colleagues (1995) conducted a large scale national epidemiological study and found that, of those with PTSD, approximately 50% also suffered from MDD. While the high frequency of C-P/D has been empirically demonstrated, due to stringency in inclusion criteria that is typical of conventional efficacy studies (e.g., excluding individuals with dual diagnoses, merely tracking changes associated with one disorder), there is limited knowledge of how to effectively treat individuals with C-P/D (Nishith, Hearst, Mueser, & Foa, 1995).

Modern behavioral treatment of PTSD focuses on exposure, although relaxation techniques also often are applied. Exposure is based on the notion that anxiety subsides through a process of habituation after exposure to the feared stimulus. Applied to PTSD, the exposure usually involves imaginal re-presentation of the traumatic events and blocking escape behaviors. While extensive research supports the use of exposure therapy in the treatment of PTSD (Rothbaum, Meadows, Resick, & Foy, 2000), exposure interventions appear to be most effective in treating re-experiencing and hyperarousal symptomatology, with less impact on the avoidance symptoms (Blake & Sonnenberg, 1998).

Despite these findings, practitioners in "real-world" settings do not appear to utilize exposure interventions with great frequency (Becker, Zayfert, & Anderson, 2004; Cook, Schnurr, & Foa, 2004). Specifically, poor treatment compliance, high drop-out rates, the aversive nature of the procedures, and limited effectiveness in treating avoidance symptoms all limit the utility of exposure-based interventions with clinical populations (Blake & Sonnenberg, 1998; Foa, Rothbaum, Riggs, & Murdock, 1991; Rothbaum et al., 2000; Schnurr, 2001; Scott & Stradling, 1997; Tarrier et al., 1999; Vaughan & Tarrier, 1992). Thus, psychological interventions that are more palatable to clients and capable of concurrently treating MDD and PTSD are needed. Behavioral Activation is one possible intervention.

Behavioral Activation's focus on modifying avoidance strategies suggest it as an effective treatment for PTSD. As stated above, avoidance is a key symptom of PTSD and individuals with PTSD have become hypervigilant in assessing their environment to locate any indication of trauma related cues, including their emotional responses. Perceived risk leads to avoidance responses that are negatively reinforced, even if the risk was never actually present. Behavioral Activation targets these avoidance responses and assists clients in engaging in behaviors that are intended to facilitate accomplishing their

goals, rather than feeling good. It is a subtle form of exposure because individuals are asked to engage in behaviors that may have become associated with the traumatic experience. However, they are not asked to engage in these behaviors for the explicit purpose of exposure, rather it is simply an attempt to remain active with their environment.

Mulick and Naugle (2004) used BA to treat a 37-year-old male police officer/military veteran suffering from C-P/D. At post-treatment assessment, self-report and observer rated data indicated that the client no longer met criteria for either PTSD or MDD. The client demonstrated improvement across all three PTSD symptom clusters (re-experiencing, avoidance, and hyper-arousal), with the greatest improvement occurring among the avoidance symptoms. Furthermore, the client provided an extremely positive evaluation of BA. The results from this case study support the rationale that BA may be an effective and palatable treatment for C-P/D.

Jakupcak and colleagues (2004) reported the results of a pilot study examining a 16-week BA intervention in the treatment of PTSD in a veteran population. Nine participants were assessed at pre- and post-treatment using self-report and observer rated measures of depression, PTSD, and quality-of-life. While depression symptoms were assessed, the study did not require participants to meet criteria for MDD. Results demonstrated statistically significant improvement in PTSD symptomatology and quality-of-life scores. While there was not a statistically significant change in self-reported scores of depression, the authors indicated that this may be a result of numerous participants having pre-treatment scores of depression in the mild range. All veterans tolerated BA very well and indicated that it was a useful intervention that affected numerous areas of their lives (e.g., health related behaviors).

Past empirical investigations have demonstrated promise for BA as an effective intervention for depression when it occurs alone and when it occurs in conjunction with PTSD (Gortner et al., 1998; Jacobson et al., 1996, Jakupcak et al., 2004; Mulick & Naugle, 2004; Porter, Spates, & Smitham 2004). Based on the positive results of these earlier examinations, the present study was developed to explore the effectiveness of BA with a larger number of subjects meeting *Diagnostic and Statistical Manual for Mental Disorders-Forth Edition (DSM-IV; APA, 1994)* criteria for both MDD and PTSD resulting from a variety of traumatic events. A non-concurrent multiple baseline across participants design (Watson & Workman, 1981) was used to examine participants' self-report and observer rated symptoms of depression and post-traumatic stress. The single subject design allowed an examination of overall change, along with a more detailed analysis of when change is taking place within the therapeutic process.

Method

Participants

Adult participants (ages 18-62) were recruited through recruitment flyers and through direct referral from mental health providers. Criteria for inclusion in the study were 1) a minimum score of a 20 on the Beck Depression Inventory- Second Edition (BDI-II; Beck, Steer, & Brown, 1996); 2) a minimum score of 14 on the Revised Hamilton Rating Scale for Depression (RHRSD; Warren, 1996); and (3) meeting *DSM-IV* criteria for MDD and PTSD, as measured by the Structured Clinical Interview for the DSM-IV (SCID; First, Spitzer, Gibbon, & Williams, 1997) and the Clinician-Administered PTSD Scale for DSM-IV (CAPS; Blake et al., 1997) respectively.

Exclusion criteria included the presence of concurrent psychiatric disorders of bipolar or psychotic subtypes of depression, current alcohol or other substance abuse, past or present schizophrenia or

schizophreniform disorder, organic brain syndrome, and mental retardation. Participants were also excluded from the study if they had been taking psychotropic medication for less than six weeks, had any change in their psychotropic medication in the last six weeks, or had been participating in another psychological treatment for less than three months. If participants were receiving other forms of treatment, they had to agree to continue receiving them at the same dose or frequency for the duration of their participation in the study.

Thirteen individuals participated in the initial assessment for this study. Five did not meet the above inclusion criteria for either PTSD (2 individuals) or MDD (3 individuals); two were excluded for meeting *DSM-IV* criteria for Bipolar Disorder; and two met criteria for the study, but choose not to participate. The final participant sample consisted of four participants.

Participant 1 (P1): The participant was a 21-year-old, single, Caucasian female. P1 presented for treatment seven months following a stranger sexual assault. She reported that prior to the attack she had been an outgoing, active, assertive individual, with a healthy lifestyle and lots of friends. She had been an accomplished musician, working toward a Bachelor's degree in music, and held a part-time job. She stated that since the attack her life had changed dramatically. She no longer played her musical instrument and had stopped exercising. She was still enrolled in courses, but rarely attended class. She had lost contact with her friends and was limited in her social contact to speaking with her mother on the telephone. P1 had received individual therapy for the first three months following the assault. She stated that she had not found therapy very helpful and had voluntarily terminated the sessions. She had been receiving psychopharmacological treatment for the past three months. At the time of the initial assessment, and for the duration of the treatment, she was stabilized on Wellbutrin SR (150 mg bid) and Trazodone (150 mg hs).

Participant 2 (P2): The participant was a 28-year-old, single, Caucasian female. While in the military, at the age of 20, she was sexually assaulted by two men. She stated that before the assault she had been a motivated, hard working individual, who enjoyed the company of people. She remained in the military for a couple of years following the attack, but experienced continued harassment from the two men and other military personnel, resulting in her leaving the military. P2 stated that she began to drink heavily following the attack in an attempt to cope with her symptoms. She was placed in detention for an alcohol related incident while in the military and since that time has limited her drinking to approximately two drinks per month. Due to the severity of her psychological symptoms, she had been unable to work for the past five years and was receiving full disability payments from the federal government. At the time of the initial assessment, she had very limited social contact and spent the majority of her time alone in her apartment. The participant began receiving mental health treatment at a VA women's trauma clinic approximately five years ago. She received individual therapy a couple times a month for the first four years. During the past year, P2 had attended group therapy once a week and received individual supportive therapy one time a month. P2 stated that she did not notice much of a change in her symptomatology since beginning her mental health treatment. At the time of the initial assessment, and for the duration of the study, she was stabilized on Celexa (40 mg qhs).

Participant 3 (P3): The participant was a 56-year-old, married, Caucasian male. He was a veteran of the Vietnam War and was involved in a variety of combat situation during his tour of duty. He stated that following the war he was able to work and had a variety of professions. P3 reported that his main source of employment over the years was a contractor. P3 stated that he first noticed psychological difficulties approximately 13 years ago. He became chronically anxious and uncomfortable around people. He moved his family away from the city to live in a cabin in the woods. The severity of his symptoms has

forced him to discontinue working approximately two years prior to the initial assessment. Since that time he spent the majority of his time in his room at an apartment he shared with his brother. P3 was supporting himself on Social Security disability payments. He was separated from his wife and stated that his primary responsibility was caring for his teenage daughter. P3 stated that he drank heavily off and on from the time he returned from Vietnam until he began attending Alcoholics Anonymous (AA) meetings 18 months ago. P3 stated that he has not drunk since starting AA. He presented at the VA for treatment approximately one year ago and has been attending a weekly group for Vietnam veterans since that time. He was stabilized on Remeron (30 mg qam) and Prazosin (4 mg qd) for the four months.

Participant 4 (P4): The participant was a 42-year-old, married, Caucasian male. He reported being sexually and physically abused from the ages of 5 to 21 by his mother, father, and sister. He reported various degrees of sexual abuse ranging from sexual touching to intercourse. Additionally, he reported severe physical abuse that resulted in occasional hospital visits for broken bones and lacerations. He had been married for approximately 18 years and had an adolescent daughter; however, he stated that he did not feel close to his wife or daughter. He expressed that he only had one person that he felt close to, a male friend whom he had known since college. At the time of the initial assessment, the participant had been working at a local church for 9 years. He reported he was not happy in his job and always looking for something different. He had seen a therapist regularly for a couple of years, 12 years prior to presenting for this study. He stated that he had not found therapy to be very helpful in the past. He had been stabilized on Elavil (100 mg qhs) for four months.

Setting

All assessment and treatment sessions were conducted in a private room at either a large university or a large VA medical center. All sessions were videotaped to allow researchers to randomly review sessions to examine treatment integrity.

Assessors

All pre- and post-assessments were completed by Ph.D. level psychology graduate students or a Ph.D. level psychologist. To ensure expertise with each instrument, the assessors completed didactic training on each measure and completed a mock assessment with the investigator. All pre- and post-assessments for P1 and P4 were conducted by the first author.

Therapists

Three therapists were utilized for this study. The therapists had attained at least a Masters degree in either Clinical or Counseling psychology and were pursuing doctoral degrees in their respective areas. All therapists were familiar with cognitive-behavioral and behavioral treatments for MDD and PTSD. To ensure expertise in BA, each therapist received additional training in BA techniques and interventions. The training was conducted by the first author and took approximately 10 hours. Therapists utilized the *Cognitive & Behavioral Treatment of Depression: A Research Treatment Manual* (Jacobson et al., 1996) with additions and adaptations by Porter et al. (2004), with each participant. The BA manual includes specific guidelines for interventions that are prescribed and should be utilized during treatment (i.e., behavioral interventions), as well as those interventions that

should not be utilized during treatment (i.e., cognitive interventions). The participants kept the BA client manual with them during treatment and upon completion of the study.

Treatment Integrity

In addition to the BA training that each therapist received, a session protocol was provided for all therapists to follow. This protocol specified the individual components of all sessions and the order in which the components were to be completed. The same procedures were utilized for sessions two through ten with all participants. A separate protocol that outlined the procedure for session 1 was given to therapists since this session required the therapist to explain the study in depth and specifically assess the difficulties that the participant was having. In the interest of addressing treatment fidelity and adherence to the BA protocol, one session for each participant was randomly selected and feedback provided. The feedback was provided by an outside, independent rater, Christopher Martell, Ph.D., the lead author on the BA manual and one of the individuals who was responsible for the training and supervision of the BA therapists in the Jacobson et al. (1996) and Dimidjian (2006) studies. Each therapist's performance was assessed using the Behavioral Activation Therapy for Depression Scale (BATS), a scale designed to measure competence, or the quality of the application of various BA techniques and therapeutic skill. For each of 11 items, the therapist's behavior was rated using a 6-point scale ranging from 0 = poor to 6 = excellent.

Outcome Measures

Beck Depression Inventory-Second Edition (BDI-II) The BDI-II (Beck et al., 1996) contains 21 items designed to assess symptoms associated with depression. It utilizes a four-point Likert-type scale, ranging from 0 to 3, to measure depressive symptomatology over the past two weeks. The directions used in this study for the BDI-II were modified slightly to account for the duration between administrations of the instrument. This study required the participants complete the BDI-II twice a week; therefore, participants were asked to rate their symptoms since the last assessment. This modification allows for a more temporal assessment of the participants' depressive symptoms.

Modified PTSD Symptom Scale (MPSS). The MPSS (Falsetti, Resnick, Resick, & Kilpatrick, 1993) contains the 17 items that are included on the PTSD Symptom Scale (PSS; Foa, Riggs, Dancu, & Rothbaum, 1993), with slight modifications to the wording of each item. The MPSS assesses for frequency of symptoms (MPSS-F) on the same 4-point scale (0 = Not at all, 1 = once in awhile, 2 = half the time, 3 = almost always) used for the PSS. The scale assesses for the severity of the symptoms (MPSS-S) on a 5-point scale ranging from A = not at all distressing to E = extremely distressing (A = 0, B = 1, C = 2, D = 3, and E = 4 for scoring purposes). The original instructions asked individuals to rate their symptoms over the last two weeks. This study required that participants complete the MPSS twice a week; therefore, the participants were asked to rate their symptoms since the last assessment.

Revised Hamilton Rating Scale for Depression (RHRSD). The RHRSD (Warren, 1996) is an observer rated instrument utilized to measure severity of depressive symptoms. It contains 22 items and has descriptive anchor points for each of the values for each item. Cognitive items assess hopelessness, helplessness, and worthlessness, but are not computed in the total score for severity. Of the 17 scored items, nine are rated on 5-point scales (0-4) and eight on 3-point scales (0-2). The total possible scores range from 0 to 52.

Structured Clinical Interview for DSM-IV (SCID). The SCID (First et al., 1997) is a semi-structured interview designed for use with adults to assess 33 frequently diagnosed disorders found in the *DSM-IV* (APA, 1994). The psychometric data on the SCID confirms it to be a reliable instrument (Segal, Hersen, & Van Hasselt, 1994; Williams et al., 1992).

Clinician-Administered PTSD Scale for DSM-IV (CAPS). The CAPS is a structured interview designed specifically to assess for symptoms of PTSD (Blake et al., 1997). The CAPS provides both a dimensional and categorical approach to assessment of PTSD and distinguishes between frequency and intensity of symptomatic experiences (Weiss, 1997). Both domains are rated on 5-point scales ranging from 0-4.

Consumer Satisfaction Survey., The consumer satisfaction survey is a measure designed by the investigators specifically for this study to gain qualitative and quantitative data on participants' overall satisfaction with the BA intervention, the therapist, and therapy protocol. The survey includes four open-ended questions with space provided for participants to respond. It also includes ten items that ask participants to rate responses on a 4-point Likert scale (1 = strongly disagree; 2 = disagree; 3 = agree; 4 = strongly agree; N/A = not applicable). Example items include, "Overall, this treatment was effective in dealing with my problems" and "This treatment was better than other treatments I have received in the past."

Procedures and Behavioral Activation

During initial screening procedures, individuals were assessed for history of a traumatic event and symptoms associated with depression and traumatic stress. Eligible individuals were invited to participate in an intake/assessment interview. During this interview participants were completely informed about the nature of the study. Upon signing the Informed Consent document, interested participants completed a brief demographic questionnaire, the BDI-II, and MPSS. If the individual met the cutoff scores on the BDI-II, he or she was interviewed using the SCID, the CAPS, and the RHRSD.

Individuals who met the above criteria were telephoned within a week and invited to participate in the study. If they chose to participate the individual was assigned to a research therapist, randomly assigned to a pre-determined baseline length of 2 or 3 weeks (5 or 7 data points respectively), and scheduled for his or her first appointment. Beginning with the first baseline session and continuing through the termination of the therapeutic intervention, each participant was asked to complete a BDI-II and MPSS on the day that was the midpoint between his or her therapy sessions. Researchers made a "reminder call" to each participant on the day that these self-report measures were to be completed.

Baseline sessions consisted of meeting once a week for 15 to 45 minutes to collect between-session materials and to monitor current symptom levels. During these baseline sessions therapists provided participants with supportive therapy only. Therapists questioned participants about their general functioning and any important events from the past week that they would like to discuss. If the participant had a topic for discussion, the therapist would provide empathic listening, but did not engage in any form of structured or directive therapy.

Regardless of the baseline length to which the participant was assigned, the BA intervention was initiated when participant data had stabilized. Baseline stability was determined by frequency of PTSD symptoms, as measured by the MPSS. A baseline was deemed stable if there were at least three

consecutive data points that were within 4 points and/or absent of a downward trend. Empirical evidence indicates that BA will have a positive impact on participants' depressive symptoms (Dimidjian et al., 2006; Jacobson et al., 1996; Porter et al., 2004); however, there is limited empirical evidence to guide what impact BA may have on PTSD symptomatology. Therefore, stability of PTSD symptoms should be established to demonstrate efficacy of BA in treating these symptoms. The criteria of a stable MPSS-F baseline controlled for the impact of "therapy contact" by necessitating a stable frequency of their PTSD symptoms before BA could be introduced. Ilardi and Craighead (1994) review the specific role that nonspecific factors play in the demonstrated effectiveness of CBT. They suggest that nonspecific factors may play a more significant role during the early stages of therapy, while the changes that occur later in the therapy process may be attributed to specific factors of CBT. The experimental control of a "supportive therapy" baseline phase should reduce the impact of the nonspecific factors.

During the initial BA session the therapist provided the participant with the rationale underlying BA. Additionally, the therapist explained that he or she would act as a "personal trainer" or "coach" for the participant. The therapist's role was to help identify how and where the participant may be lacking reinforcement in his or her life and to collaborate with the participant to find activities and behaviors that may provide him or her with pleasure and interest that were previously absent from his or her life (Martell et al., 2001).

The treatment of BA was delivered in a standardized fashion, with each session containing a distinct beginning, middle, and end. The beginning of each session included greeting the client followed by the client completing the BDI-II and the MPSS. Issues for the agenda that was followed throughout the rest of the session were established and written down. The agenda was constructed collaboratively to determine the most important topics to be addressed each session. The agenda for sessions two through ten always included a discussion of the previous week's homework assignment, including reviewing the daily activity chart that the client had begun keeping at the initiation of BA, and the assignment of the next week's homework. Due to the nature of the therapy, typically only one or two additional items were placed on the agenda for that session. The duration of the beginning phase of the session was approximately ten minutes. During the middle of the session, therapist and participant worked together on the issues that were placed on that session's agenda. The session typically did not deviate from the established agenda, unless an extraordinary issue arose (i.e., suicidality). The end portion of each session consisted of the therapist briefly reviewing topics that were discussed during that session. Additionally, between session assignments were derived collaboratively. It was the therapist's responsibility to ensure that both parties understood the specifics of the assignments. As treatment progressed, participants demonstrated more autonomy in developing their own between session work. The session ended with the participant having an opportunity to ask any questions he or she may have had and scheduling the next appointment.

Ten sessions or 12 weeks after the introduction of BA treatment, whichever was first, all participants attended a post-treatment assessment at which he or she completed the BDI-II, MPSS, and a consumer satisfaction survey. At this time, participants were also interviewed using the RHRSD, CAPS and SCID. After the termination of BA and completion of the post-treatment assessment, all participants were given a referral to a different provider for continued psychological care.

Statistical Analysis

The reliable change index (RCI; Jacobson & Truax, 1991) was used to evaluate the statistical significance of change in the MPSS-F, MPSS-S, BDI-II, CAPS, and RHRSD scores. The RCI examines the differences in scores from pre-treatment and post-treatment assessments, corrected for the reliability of the measure. Values greater than 1.96 are considered statistically significant change (Jacobson & Truax; McGlinchey, Atkins, & Jacobson, 2002). Standard deviations were calculated from these participants' pre-assessment scores (CAPS and RHRSD) or termination of baseline scores (MPSS-F, MPSS-S, and BDI-II). The reliability coefficients were obtained from publications specifically addressing the psychometrics associated with the respective measures. The present study utilized the following values for the outcome measures: MPSS-F: $SD = 5.44$, $r = .98$ (Stephenson, Marchand, Marchand, & Di Blasio, 2000); MPSS-S: $SD = 15.21$, $r = .98$ (Stephenson, Marchand, Marchand, & Di Blasio, 2000); BDI-II: $SD = 4.08$, $r = .90$ (Nezu, Nezu, McClure, & Zwick, 2002); CAPS: $SD = 3.77$, $r = .86$ (Weathers, Ruscio, & Keane, 1999); RHRSD: $SD = .85$, $r = .85$ (Nezu, Nezu, McClure, & Zwick, 2002). As a result of this study CAPS standard deviation being significantly lower than what is typically found, a more conservative RCI was calculated using the average standard deviation from a number of large treatment outcome studies ($SD = 23.00$).

Results

Self-Report Data

P1: P1 was randomly assigned to a two-week baseline. During this baseline period the participant's self-report data indicated an upward trend across all measures. Due to absence of a downward trend in the data and the high level of clinical distress P1 was reporting, the treatment phase was initiated following this two-week period. Figure 1 indicates a clear reduction in P1's self-reported PTSD frequency, PTSD severity, and depressive symptomatology from baseline to the termination of the treatment. P1's MPSS-F, MPSS-S, and BDI-II scores demonstrated statistically significant change (Table 1).

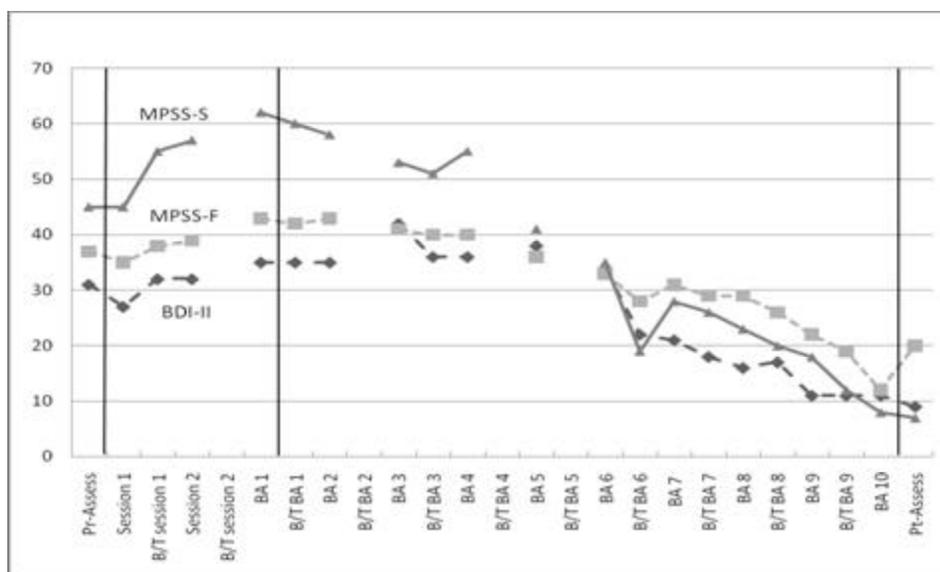


Figure 1. Participant 1 Self-report Data

Table 1. Self-report Measure Pre- and Post-intervention Scores

	P1 Pre- BA	P1 Post- BA	P2 Pre- BA	P2 Post- BA	P3 Pre- BA	P3 Post- BA	P4 Pre- BA	P4 Post- BA
MPSS-F	43	20	31	32	35	39	32	20
MPSS-F RCI		21.10*		-.91		-3.67*		11.00*
MPSS-S	62	7	41	44	25	37	40	20
MPSS-S RCI		18.09*		-.98		-3.95*		6.58*
BDI-II	35	9	28	28	29	32	36	28
BDI-II RCI		14.29*		0.00		-1.65		4.40*

* = RCI > 1.96

P2: P2 was randomly assigned to a three-week baseline phase. At the end of this period P2’s data were determined to meet the criteria for stability and the treatment phase was initiated. The treatment phase was terminated 12 weeks after the initiation of BA, with the participant having attended 9 BA sessions. Figure 2 and Table 1 indicate relative stability of P2’s self-report data across all measures.

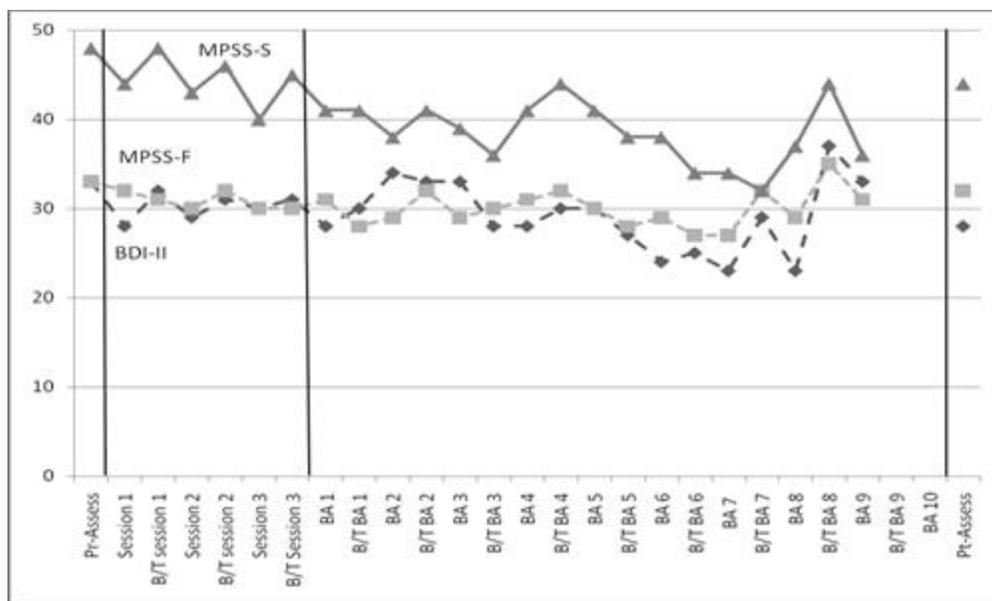


Figure 2. Participant 2 Self-report Data

P3: P3 was randomly assigned to a three-week baseline phase. At the end of this period P3’s data were determined to meet the criteria for stability and the treatment phase was initiated. The treatment phase was terminated 12 weeks after the initiation of BA, with P3 having attended 9 BA sessions. Figure 3 indicates substantial variability in P3’s self-report data. P3 actually demonstrated a statistically significant increase in the self-reported frequency and severity of his PTSD symptoms (Table 1), although the MPSS-F only increased four points from a pre-intervention score of 35 to a post-intervention score of 39. The data demonstrate much more variability in MPSS-S scores. At the termination of the baseline phase, P3 had a MPSS-S score of 25. There was an initial drop in the participant’s scores for this measure immediately following the implementation of BA. Subsequently, there was a consistent upward trend in the data, with a post-assessment MPSS-S score of 37. There was no statistically significant change in P3’s depression scores.

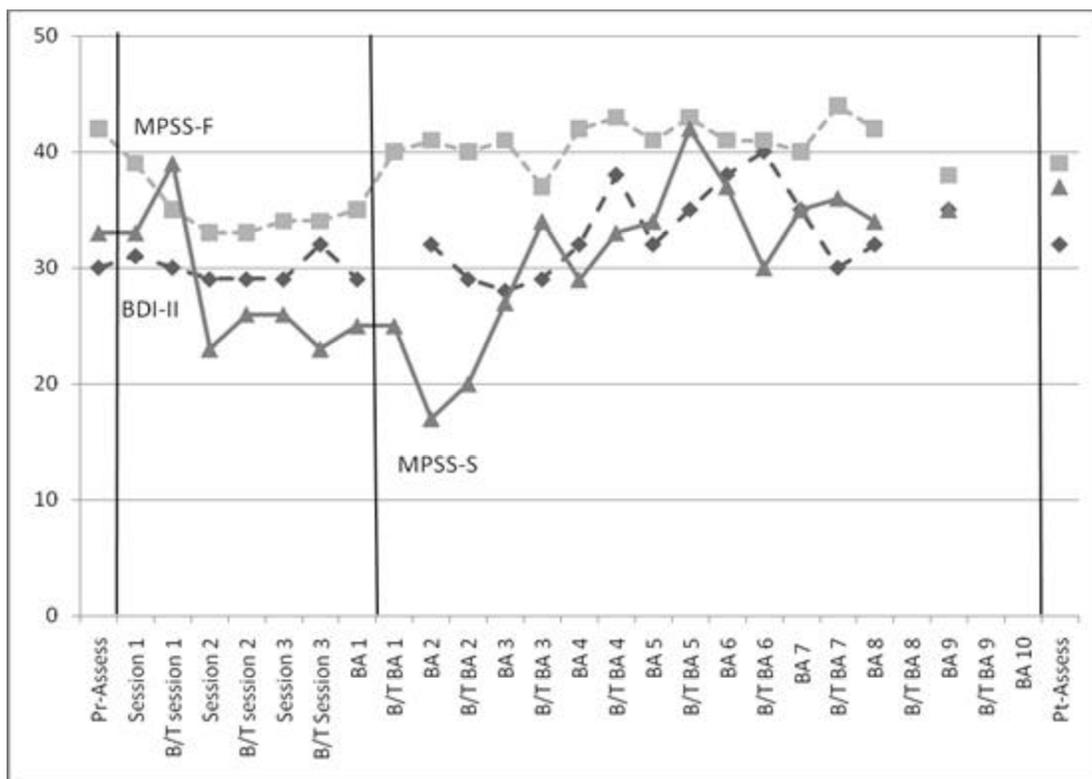


Figure 3. Participant 3 Self-report Data

P4: P4 was randomly assigned to a two-week baseline phase. At the end of this period it was determined that P4’s data did not meet criteria for stability and the baseline was extended. Following the fourth week of baseline, the data demonstrated stability and the treatment phase was initiated. Figure 4 indicates a gradual, but steady reduction in P4’s self-reported PTSD and depression symptomatology from baseline to the termination of the treatment phase. P4 demonstrated statistically significant improvement across all self-report measures (Table 1). However, closer examination of P4’s MPSS-S scores indicates a downward trend across all phases.

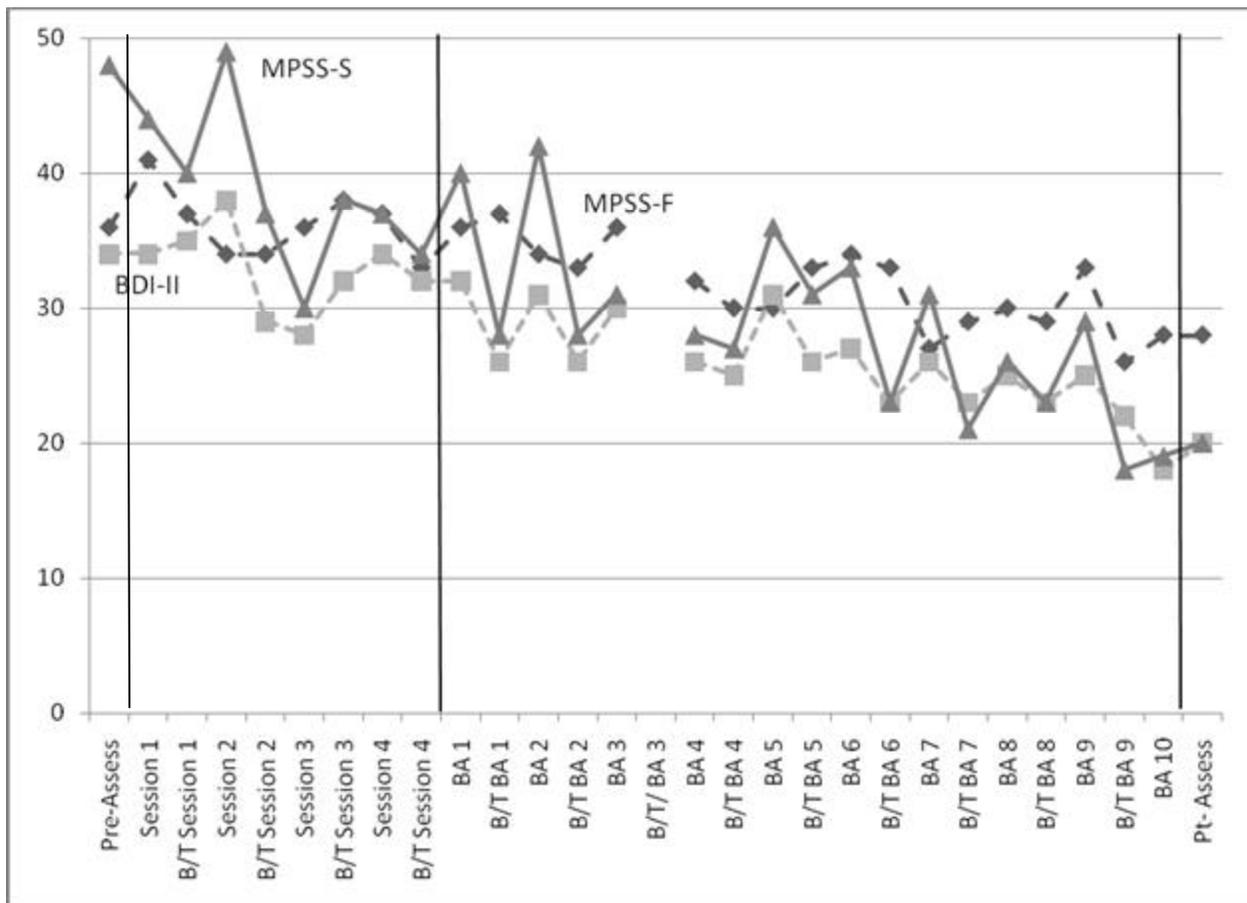


Figure 4. Participant 4 Self-report Data

Observer-Rated Data

P1: At the time of post-assessment, P1 no longer met criteria for either PTSD or MDD as determined by the structured interviews. The pre- and post-assessment CAPS data demonstrate a statistically significant overall reduction in the CAPS score of 51 points (Table 2). The largest reduction was seen in the avoidance symptom cluster. However, a noticeable reduction in the re-experiencing cluster also occurred. There was also a statistically significant reduction of 13 points in the participants RHRSD score from pre- to post-assessment (Table 2).

Table 2. CAPS and RHRSD Scores

	P1 Pre	P1 Post	P2 Pre	P2 Post	P3 Pre	P3 Post	P4 Pre	P4 Post
Total Re-experiencing	27	12	24	20	18	15	30	8
Total Avoidance	40	10	34	21	40	37	37	34
Total Hyperarousal	21	15	25	21	33	34	24	17
Total Symptoms	88	37	83	62	91	86	91	59
CAPS RCI		25.63*		10.55*		2.51*		16.08*
Conservative CAPS RCI		4.19*		1.72		.41		2.63*
RHRSD	17	4	25	13	23	23	19	16
RHRSD RCI		6.53*		6.03*		0		1.51

* = RCI > 1.96

P2: At the time of the post-assessment, P2 no longer met criteria for MDD as determined by the SCID. P2 still met diagnostic criteria for PTSD based on the CAPS structured interview. There was a statistically significant reduction in the CAPS score of 21 points; however, this significance was lost when utilizing the more conservative RCI calculation (Table 2). Again, the largest reduction was seen in the avoidance symptom cluster. There was a statistically significant reduction of 12 points in P2's RHRSD score from pre- to post-assessment (Table 2).

P3: P3 still met criteria for MDD and PTSD at the post-assessment. The pre- and post-assessment CAPS data demonstrate a statistically significant overall reduction in the CAPS score of five points. This significance was lost with the conservative RCI approach (Table 2). There was no change in the P3's RHRSD score (Table 2).

P4: At post-assessment, P4 no longer met criteria for either PTSD or MDD as determined by the structured interviews. There was a statistically significant reduction in pre- to post-assessment total CAPS score of 32 points (Table 2). The largest reduction was seen in the re-experiencing symptom cluster. There was no significant change in the participant's RHRSD score from pre- to post-assessment (Table 2).

Participant Satisfaction

The average score for the participants on the 10 Likert items was 3.0, with scores ranging between 1 and 5. In general, the participants reported the aspect of therapy that was most helpful was

keeping track of daily activities and reviewing them during the sessions. The participants also commented that they found it helpful to establish small goals for themselves. Finally, there was uniformity in the participants' belief that 10 sessions was not enough.

Treatment Adherence Ratings

One session was randomly selected from each participant to be viewed and rated for therapist treatment adherence. An overall adherence rating score for each participant's therapist was collected (P1 = 41, P2 = 52, P3 = 53, and P4 = 37). The individual item ratings ranged from 2 (mediocre) to 6 (excellent).

Discussion

The present study provides moderate support for the efficacy of a 10-week BA intervention in treating comorbid PTSD and MDD symptomatology. The data indicate that two participants no longer meet *DSM-IV* criteria for either PTSD or MDD at the end of treatment, with an additional participant no longer meeting criteria for MDD. While the participants are still experiencing some symptomatology, overall the symptoms are occurring with less frequency and severity than before the BA intervention.

Individual Participant Data

P1: The data clearly demonstrate that the participant's PTSD and MDD symptomatology began to improve soon after the initiation of the treatment phase of the study. This participant's improvement was consistently demonstrated across the self-report measures and the observer rated data. Individually, this participant demonstrates the strongest support for the efficacy of BA.

At the start of treatment, P1 indicated that she would like to focus on being more assertive in her work environment. The first sessions were spent discussing instances when she had been passive in her interactions with people. Therapy also targeted the participant becoming more socially engaged. By the end of the treatment phase, the participant stated that she had become more assertive in her dealing with co-workers and was participated in increased social activity during the week. The participant stated that she had even begun dating a man. The acquaintance had asked her out on a couple of occasions over the last six months, but she had turned him down. In efforts to change her behavioral routine, she had agreed to go out with him and had discovered she enjoyed his company.

P2: The self-report data for P2 demonstrate a relatively stable baseline across all phases of the study. There was some evidence of a slight downward trend in the treatment phase data, until BA session 8 at which point there is a clear upward trend. It is important to note that the day before BA session 8 the participant was told that she was going to have to have a hysterectomy in the coming month. This news was very distressing to P2 and likely had a negative impact on her psychological symptoms. Nonetheless, P2 no longer met criteria for MDD at the termination of the intervention. The fact that the participant did not meet criteria for MDD may seem contradictory to the participant's BDI-II scores. This can be explained by the fact that the P2's response to SCID questions indicated that she no longer experienced a depressed mood or anhedonia, therefore not meeting *DSM-IV* criteria for depression. Additionally, there was a statistically significant 12-point reduction in her RHRSD score. Researchers have noted that self-report measures are typically more conservative measures of change for depressive

symptoms (Dobson, 1989). When considering the participant's level of activity over the course of the intervention phase, there was a clear increase in the amount of socializing in which she engaged. Additionally, one of her established therapy goals was to become more assertive. Over the course of treatment P2 indicated that she was increasing her assertiveness with others and also demonstrated more assertive behavior during treatment sessions.

P3: The self-report data and observer rated data both indicate that P3 did not demonstrate any significant improvement in his C-P/D symptomatology. In fact, the self-report data suggest an increase in his PTSD symptoms. The focus of therapy with P3 had been attempting to increase his level of activity outside of his home. The participant would agree to homework assignments of activities outside of the home and would comment that he should get out more; however, he would not follow through with the assignments. Each week the therapist attempted to revise the assignments to greater facilitate their completion, but P3's poor follow through continued throughout the treatment phase. Homework assignments and the daily tracking activities are considered essential components of BA (Martell et al., 2001). By failing to complete these vital tasks it could be argued that P3 did not receive an adequate dose of BA. Additionally, the chronic nature of the participant's symptoms might have made them more resistant to change. The expressed goal of BA is to change the individual's behavioral repertoire. With this particular participant, the trauma had occurred over 30 years ago allowing for decades of avoidance behavior to be negatively reinforced. Finally, this participant's primary source of support was disability compensation. This financial dependency could have had some negative impact on his motivation for making therapeutic progress.

P4: In many ways, P4 was the most unique participant of this study. His trauma was the longest in duration and occurred earliest in life. The focus of therapy with many of the other participants was focused on helping them return to doing things that they enjoyed before the trauma. Given the young age when abuse began this focus was impossible for P4. For this participant, the goal was not to return to a similar pre-trauma behavioral repertoire, rather it was to develop a completely new behavioral repertoire. Additionally, this was the only participant who stated his previous treatment had been psychoanalysis. Initially, P4 struggled with the behavioral nature of the therapy sessions. Despite these difficulties, P4 demonstrated a consistent reduction in all depressive and PTSD symptomatology across the treatment phase. At the termination of treatment, P4 seemed to be gaining an effective understanding of the therapeutic concepts of BA and had made substantial gains in effectively analyzing the impact his avoidance behaviors had on his psychological symptoms.

Overall Participant Data

There are a number of points to address concerning these participants as a whole. For those participants who demonstrated improvement in this study, it appeared to occur toward the latter portion of treatment. This pattern is consistent with the findings of Mulick and Naugle (2004). It is possible that improvement at this point in treatment was associated with the participants' attainment of an effective understanding of how depression is a consequence of their context and application of this understanding to analyzing and modifying their behavior. The goal of BA is not simply getting a client to become active, rather it is getting the client to engage in the right activities (Martell et al., 2001). The client must increase those activities that are going to increase his or her contact with available reinforcers in his or her environment. One of the therapeutic components that participants stated was most helpful was the recording of the daily activities. Most stated that by tracking what they did during the day, their high level of inactivity and/or participation in activities that were not reinforcing became apparent. P1 stated that by

doing this task she realized that she was “doing a lot of nothing.” The process of analyzing one's activities and resulting moods takes time and practice, which may account for more improvement in later sessions.

As stated earlier, the focus of BA treatment never involved educating about or conducting *in-vivo* or imaginal exposure. Sessions consisted of discussing participants' current avoidant behavioral repertoires and the way they responded to stress in their lives. Time was spent on exploring ways in which they could behaviorally respond in a manner that was more reinforcing in these situations. The data suggest that the process of helping participants become engaged in more reinforcing activities and developing the skills for being able to examine their own behavioral repertoire might have been effective at reducing symptoms they were experiencing.

Similar to results found by Mulick and Naugle (2004), the reduction in various PTSD unique symptoms, along with C-P/D common symptoms, indicates that BA had some efficacy in treating symptoms of both disorders. Furthermore, for half of the participants the CAPS data indicate that BA had the greatest effect on those symptoms that fall in the avoidance cluster of PTSD. The improvement in avoidance symptoms is not unexpected given the rationale behind and therapeutic techniques utilized in BA. The expressed purpose of BA is to help individuals develop a broader, more flexible, behavioral repertoire. By expanding restricted repertoires there is a high likelihood that an individual who suffers from PTSD will naturally encounter situation that they had been avoiding (i.e., people, places, and/or activities). While there is a clear indication that the avoidance cluster was most impacted, the data suggest that BA also had some impact at reducing the participants' re-experiencing and hyperarousal symptoms.

While examining therapeutic aspects that might have contributed to improvement seen in this study, it is prudent to discuss nonspecific factors of psychotherapy. While the baseline phase offered some control for the frequency of PTSD symptomatology, the effect of the nonspecific factors on severity of participants' PTSD symptoms cannot be ruled out. An examination of participants' MPSS-S data indicate that participants P1, P2, and P4 had a downward trend in the self-report severity data from their first baseline session through the termination of BA treatment. This reduction of severity across both the baseline and treatment phases of the study could indicate that nonspecific therapy factors are causal in reducing the severity of PTSD symptomatology. Obviously the effects of nonspecific factors on clinical change can never be entirely ruled out; however, the utilization of a baseline phase in this study strengthens the support for BA mediating the reduction in C-P/D symptomatology, specifically PTSD frequency and depressive symptoms.

Therapists Integrity Ratings

The authors acknowledge that conducting adherence ratings for only 10% of the treatment sessions is not optimal. However, inclusion of the adherence data that are available does provide some indication of the quality of BA being administered. The adherence ratings for therapists were judged by the independent expert rater to be more than acceptable and the rater indicated that all therapists would likely be selected to participate in a BA outcome study based on evaluation of their performances. During the discussion regarding the overall ability of the therapists, the rater indicated that these ratings were very acceptable, it was unusual to have scores higher than this, and that these scores are similar to ratings of those therapists in the BA replication study (Dimidjian et al., 2006).

Limitations and Future Directions

There are limitations within this study that should be addressed. First, the high frequency of the administration of the self-report measures may have been too taxing on participants. While the data were beneficial, participants made frequent comments during the study regarding the number of times they completed measures. The frequent measurement may have resulted in participants being less diligent regarding careful assessment of their PTSD and MDD symptomatology. Second, there were 3 different therapists utilized with these 4 participants adding another factor to be considered when interpreting the results. While all therapists were rated as being competent in administering BA, experimental control would have been strengthened had one therapist been able to deliver the therapy to all participants. However, the diversity of therapists utilized may enhance the generalizability of these results to applied settings.

Future research, with larger sample sizes, may provide further evidence as to the characteristics of individuals for whom this might be an effective treatment. Additionally, almost all participants commented that they would have liked the treatment phase to be longer in duration. Given the chronicity of many of the participants' psychological difficulties, it is reasonable to suggest that 10 sessions were not enough to demonstrate substantial reductions in symptomatology. Future research might involve expanding the number of therapy sessions to determine if there is a dose effect associated with administration of BA. Finally, if future research continues to show that BA is most effective in reducing the frequency and intensity of those symptoms in the avoidance cluster, it might be beneficial to examine the effectiveness of a combination treatment to address the other symptom clusters. For instance, one interesting question to explore might be, "Does beginning with a specified number of BA sessions limit the drop-out rates and non-compliance issues of exposure therapy, while enhancing the therapeutic effects of both therapies?"

Conclusion

It is always difficult to determine the most effective way to treat psychological disorders when they co-occur. Specialized interventions typically only focus on one disorder or the other. The standard techniques utilized to treat PTSD typically only address those areas that were impacted by the traumatic experience. With BA the client is taught to examine all areas of his or her life, trauma related and otherwise, and to determine where he or she needs to become more active and engaged. This difference might indicate that BA is more suited for treating individuals with comorbid conditions such as C-P/D.

The current investigation has provided some support for the efficacy of BA in concurrently treating the symptoms associated with PTSD and MDD. A finding that stands out and should not be overlooked is that participants consistently evaluated BA positively. Given that clients often find exposure-based treatments too aversive, the high consumer satisfaction with BA provides even further support for its utilization with traumatized populations. These findings, in conjunction with the findings of Jakupcak and colleagues (2006) and Mulick and Naugle (2004), suggest that BA for C-P/D is worthy of further empirical investigation.

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