



PERGAMON

Journal of Behavior Therapy
and Experimental Psychiatry 29 (1998) 21–29

JOURNAL OF
behavior
therapy
and
experimental
psychiatry

Effectiveness of anxiety management training in the treatment of posttraumatic stress disorder: a preliminary report

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Abstract

This preliminary study investigated the effectiveness of anxiety management training (AMT), a coping skills treatment similar to systematic desensitization, in comparison to implosive therapy (IT), an exposure-based treatment, for treating six Vietnam combat veterans with posttraumatic stress disorder (PTSD). The Clinician Administered PTSD Interview Scale (CAPS; Blake et al. (1988), *The Behaviour Therapist*, 18, 187–188) and a self-monitoring measure (Weathers et al., 1991) were used as dependent measures. A single-subject, multiple-baseline, crossover design (ABC/ACB) was employed. A new statistic for such designs (Mueser et al. (1991), *Behaviour Modification*, 15, 134–155), based on classical test theory, was used to assess treatment effects on intrusive war memories and avoidance of stimuli reminiscent of war. Within-subject results indicated that AMT and IT were similarly effective in reducing the frequency and intensity of intrusions and avoidance. This preliminary report therefore suggests that it may be productive to investigate multidimensional approaches (combining coping skills, exposure-based, and other approaches) to the treatment of combat-related PTSD as Foa et al. (1991), *Journal of Consulting and Clinical Psychology*, 59, 715–723 and Nishith et al. (1995), *Behaviour Therapy*, 26, 319–335 have for rape-related PTSD. Published by Elsevier Science Ltd. All rights reserved.

Due to the continued interest in posttraumatic stress disorder (PTSD), investigations of the comparative effects of various psychological treatments have recently been conducted (Brom et al., 1989; Boudewyns and Hyer, 1990; Boudewyns et al., 1990; Cooper and Clum, 1989; Foa et al., 1991; Keane et al., 1989a). All of the above studies have concluded that exposure-based treatments, such as implosive therapy (IT), are effective in ameliorating the problem behaviors of PTSD.

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However, there is a need for further study of various behavioral treatments for combat veterans with PTSD, as in studies on rape- and other trauma-related PTSD. For example, Brom et al. (1989) and Foa et al. (1991) both found that efforts at extinction of anxiety through exposure training and the teaching of coping skills to control anxiety were equally effective treatments for PTSD caused by various traumas and rape, respectively. Thus, it is proposed that the preliminary investigation of the effectiveness of a coping skills treatment, such as anxiety management training (AMT), with combat veterans would be a worthwhile place to begin. AMT has been shown to be efficacious in reducing anxiety among patients with various anxiety disorders in controlled clinical trials (see Suinn, 1990). Another reason for using AMT in this study is its procedural similarity to systematic desensitization which has demonstrated effectiveness for combat-related PTSD (Schindler, 1980). The present study investigated the effectiveness of Suinn's (1990) AMT and IT (Lyons and Keane, 1989; Stampfl and Levis, 1967) for the treatment of combat-related PTSD, and tested the following hypotheses regarding two of the main problematic behaviors associated with PTSD: (1) both AMT and IT would result in statistically significant reductions in the frequency and intensity of intrusions (i.e., flashbacks, intrusive thoughts, nightmares of the trauma); and (2) both AMT and IT would result in statistically significant reductions in the frequency and intensity of avoidance (e.g., efforts to avoid activities that arouse recollections of the trauma).

1. Method

1.1. Participants

Six male, Vietnam combat veterans diagnosed with PTSD according to the Diagnostic and Statistical Manual—3rd edn—Revised (DSM-III-R; American Psychiatric Association, 1987) volunteered to be participants in this study. The participants in this study were similar to those in previous outcome studies with regard to ethnicity, marital status, education, employment, and enlistment status (Boudewyns and Hyer, 1990; Keane et al., 1989a).

1.2. Screening measures

The following three measures were used to screen participants for PTSD: (1) The combat exposure scale (CES; Keane et al., 1989b); (2) The Mississippi Scale for combat-related PTSD (MSCP; Keane et al., 1988); and (3) the impact of event scale-revised (IES-R; Horowitz et al., 1979). Participants were required to satisfy the following two criteria in order to be asked to meet with the first author for a formal assessment of PTSD: (1) a score of 15 or greater on the CES (indicating moderate or greater levels of combat exposure; Keane et al., 1989b); and (2) a score of 107 or greater on the MSCP (indicating PTSD; Keane et al., 1988), or a total score of 40 or greater on the IES-R (indicating PTSD; Brom et al., 1989).

Regarding the screening measures for the six participants who were treated in the study, the mean CES score was 31.17 (SD = 7.25), the mean MSCP score was 117.67 (SD = 19.35), and the mean IES-R total score was 43 (SD = 12.38). Thus, the participants in the current study satisfied the cutoffs recommended by the authors of the scales and those reported in previous studies. In fact, the mean CES score reported above suggests that the participants in the present study experienced “heavy combat” exposure, according to the authors of the scale.

1.3. Dependent variables

The CAPS interview scale (Blake et al., 1988) was used to measure the frequency and intensity of intrusions and avoidance. It employs a 5-point Likert-type scale and assesses PTSD symptoms as described in the DSM-III-R. The scale has excellent inter-rater reliability on the frequency and intensity for both subscales ($r = 0.99$ for frequency and 0.98 for intensity). Its internal consistency is good, with Cronbach alphas for the intrusion and avoidance subscales of 0.77 and 0.85, respectively. The CAPS has a weekly form and a monthly form. The monthly form was used to generate the diagnosis of PTSD.

The following outcome measures were used to assess changes on a weekly basis on the independent variable of treatment type: (1) The CAPS-weekly form (Blake et al., 1988), which was used to measure the frequency and intensity of intrusions and avoidance; and (2) a self-monitoring form which measured the intensity of intrusions and avoidance (Weathers et al., 1991). Each of the behaviors was rated on a 5-point Likert-type scale, where 1 indicated absence of the behavior and 5 indicated extreme intensity of the behavior. The ranges of scores for the intrusion and avoidance subscales were modified so that they would be on the same scale as those derived from the CAPS.

1.4. Independent variable

1.4.1. Treatments

AMT involved six, weekly, 2 h sessions, during which anxiety- and relaxation-related imagery, and progressive muscle relaxation was used to teach participants adaptive responses to anxiety. The procedures described in the AMT treatment manual by Suinn (1990) were followed for each session. In general, AMT systematically taught participants to identify the internal cognitive and physical signs of anxiety, via anxiety scenes (i.e., except those involving combat), and then to counter them with relaxation until the anxiety was significantly reduced.

IT involved six, weekly, 2 h sessions, which were modeled after the procedures set forth in the Lyons and Keane (1989) treatment manual, with the exception of the progressive muscle relaxation training, which was excluded so that the procedures in IT and AMT would not unnecessarily overlap. In general, IT required exposing participants to repeated and detailed, imaginal presentations of the conditioned stimuli representing the combat trauma until there was a reduction in observed and self-reported anxiety. Audiotapes of sessions were rated by expert judges (R. Suinn

[AMT] and P. Boudewyns [IT]), who indicated that both treatments were implemented adequately.

1.5. Design

Because of the preliminary nature of the study, a single-subject, multiple-baseline (i.e., 2, 3, and 4 weeks), crossover design (ABC/ACB) was employed where each participant received both treatments. The order of the two treatments was counterbalanced across two groups of three participants each so as to control for order effects. Following baseline, participants received six sessions of AMT followed by six sessions of IT, or the reverse.

1.6. Method of data analysis

Because of the variability in the baseline and intervention data, and because the lack of standardized procedures for visual inspection of data often results in subjective and unreliable conclusions (Baer, 1977), a statistical procedure specifically designed for single-case and multiple-baseline studies was used to evaluate treatment outcome for each participant separately. The statistical analysis for single-case designs used by Mueser et al. (1991) and Nishith et al. (1995) to evaluate the outcome of cognitive-behavioral treatments of PTSD was used. In order to test for statistical significance, weekly scores were converted into ipsative *z*-scores and the differences among these scores were required to exceed a “critical difference” which is based on a formula taking into account the serial dependency (autocorrelation) or the violation of the assumption of independence among a single participant’s scores, as well as the number of comparisons conducted (see Nishith et al. (1995) for a detailed description). Mean baseline ipsative *z*-scores were compared to final ipsative *z*-scores for each of the treatments. Differences in final ipsative *z*-scores between the two treatments were also compared.

2. Results

The statistical test described above was employed to assess the following differences for each individual participant: (1) mean baseline intrusion and avoidance scores versus intrusion and avoidance scores following the final session of AMT or IT (whichever was implemented first); (2) mean baseline scores versus scores following the final session of AMT or IT (whichever was implemented second); and (3) the final scores of second treatment versus the final scores of first treatment. It should be noted that large discrepancies between mean baseline and final scores does not necessarily indicate statistical significance, as each participant’s scores were evaluated separately. That is, tests of statistical significance utilized each participant’s mean baseline and treatment scores individually and took into account the variability of scores for only one participant at a time.

2.1. Treatment effects

Intrusions and avoidance behaviors were measured by the self-monitoring scale and the CAPS-interview, which results in two scores, one for frequency and one for intensity. These scores are derived for both intrusions and avoidance. From this point forward, these two scores will be referred to as interview-frequency and interview-intensity. Table 1 presents the intrusion scores for Participants 1, 2, and 3. In order for the first treatment (AMT in this case) to demonstrate effectiveness in reducing intrusions for a particular participant, its final score on a given measure was required to be significantly reduced from the mean baseline score on that measure. This occurred following AMT for Participants 2 and 3. In order for the second treatment (IT in this case) to demonstrate effectiveness in reducing intrusions for a particular participant, its final score on a given measure had to be significantly reduced from the final score of the first treatment (AMT in this case) on that measure. This did not occur for any of the participants. In fact, a significant increase in self-monitoring intrusion score was noted at the end of IT (after it had been significantly reduced by AMT) for Participant 3. Again, only those reductions which were significantly reduced from the final score of AMT were considered as evidence of the effectiveness of IT.

Tables 2–4 present the remainder of the intrusion and avoidance scores for all of the participants. In summary, instances of statistically significant reductions in both

Table 1

Intrusion scores for participants who received anxiety management training first and implosive therapy second

Participant 1	Participant 2	Participant 3
<i>Self-monitoring</i>		
<i>M</i> Baseline = 11	<i>M</i> Baseline = 14	<i>M</i> Baseline = 7
<i>SD</i> = 1.41	<i>SD</i> = 2.31	<i>SD</i> = 1.73
Final AMT = 5	Final AMT = 10*	Final AMT = 2*
Final IT = 2*	Final IT = 14	Final IT = 6 +
<i>CAPS interview-frequency</i>		
<i>M</i> Baseline = 14	<i>M</i> Baseline = 15	<i>M</i> Baseline = 9
<i>SD</i> = 2.83	<i>SD</i> = 2.31	<i>SD</i> = 1.71
Final AMT = 5	Final AMT = 12	Final AMT = 1*
Final IT = 5	Final IT = 10*	Final IT = 1*
<i>CAPS interview-intensity</i>		
<i>M</i> Baseline = 10	<i>M</i> Baseline = 14	<i>M</i> Baseline = 7
<i>SD</i> = 2.83	<i>SD</i> = 2.89	<i>SD</i> = 0.89
Final AMT = 4	Final AMT = 9	Final AMT = 2*
Final IT = 2*	Final IT = 5*	Final IT = 2*

Note: CAPS = Clinician Administered Posttraumatic Stress Disorder Interview; all scores ranged from 0 (no intensity/frequency) to 16 (highest intensity/frequency); * = statistically significant decrease from Baseline score ($p < 0.05$); + = statistically significant increase from final score of first treatment ($p < 0.05$).

Table 2

Intrusion scores for participants who received implosive therapy first and anxiety management training second

Participant 4	Participant 5	Participant 6
<i>Self-monitoring</i>		
<i>M</i> Baseline = 7	<i>M</i> Baseline = 3	<i>M</i> Baseline = 7
<i>SD</i> = 4.24	<i>SD</i> = 1.15	<i>SD</i> = 1.15
Final IT = 0*	Final IT = 2	Final IT = 6
Final AMT = 0*	Final AMT = 3	Final AMT = 1*◆
<i>CAPS interview-frequency</i>		
<i>M</i> Baseline = 10	<i>M</i> Baseline = 7	<i>M</i> Baseline = 9
<i>SD</i> = 0.71	<i>SD</i> = 1.53	<i>SD</i> = 2.31
Final IT = 1*	Final IT = 5	Final IT = 5*
Final AMT = 1*	Final AMT = 0*	Final AMT = 0*
<i>CAPS interview-intensity</i>		
<i>M</i> Baseline = 12	<i>M</i> Baseline = 8	<i>M</i> Baseline = 8
<i>SD</i> = 0.00	<i>SD</i> = 1.43	<i>SD</i> = 1.43
Final IT = 1*	Final IT = 4	Final IT = 2
Final AMT = 1*	Final AMT = 0*	Final AMT = 0*

Note: CAPS = Clinician Administered Posttraumatic Stress Disorder Interview; all scores ranged from 0 (no intensity/frequency) to 28 (highest intensity/frequency); * = statistically significant decrease from Baseline score ($p < 0.05$); ◆ = statistically significant decrease from final score of first treatment ($p < 0.05$).

Table 3

Avoidance scores for participants who received anxiety management training first and implosive therapy second

Participant 1	Participant 2	Participant 3
<i>Self-monitoring</i>		
<i>M</i> Baseline = 19	<i>M</i> Baseline = 25	<i>M</i> Baseline = 17
<i>SD</i> = 5.66	<i>SD</i> = 1.15	<i>SD</i> = 3.86
Final AMT = 11	Final AMT = 23	Final AMT = 11
Final IT = 6*	Final IT = 22	Final IT = 16
<i>CAPS interview-frequency</i>		
<i>M</i> Baseline = 20	<i>M</i> Baseline = 25	<i>M</i> Baseline = 20
<i>SD</i> = 1.41	<i>SD</i> = 1.73	<i>SD</i> = 1.29
Final AMT = 10*	Final AMT = 18*	Final AMT = 8*
Final IT = 6*	Final IT = 17*	Final IT = 12
<i>CAPS interview-intensity</i>		
<i>M</i> Baseline = 21	<i>M</i> Baseline = 26	<i>M</i> Baseline = 19
<i>SD</i> = 4.95	<i>SD</i> = 0.58	<i>SD</i> = 1.89
Final AMT = 10*	Final AMT = 10*	Final AMT = 6*
Final IT = 5*	Final IT = 11*	Final IT = 9*

Note: CAPS = Clinician Administered Posttraumatic Stress Disorder Interview; all scores ranged from 0 (no intensity/frequency) to 28 (highest intensity/frequency); * = statistically significant decrease from Baseline score ($p < 0.05$).

Table 4

Avoidance scores for participants who received implosive therapy first and anxiety management training second

Participant 4	Participant 5	Participant 6
<i>Self-monitoring</i>		
<i>M</i> Baseline = 11	<i>M</i> Baseline = 14	<i>M</i> Baseline = 9
<i>SD</i> = 4.24	<i>SD</i> = 2.65	<i>SD</i> = 1.00
Final IT = 2	Final IT = 8	Final IT = 10
Final AMT = 0	Final AMT = 5*	Final AMT = 6
<i>CAPS interview-frequency</i>		
<i>M</i> Baseline = 15	<i>M</i> Baseline = 21	<i>M</i> Baseline = 13
<i>SD</i> = 2.12	<i>SD</i> = 1.15	<i>SD</i> = 3.56
Final IT = 2*	Final IT = 7*	Final IT = 8
Final AMT = 2*	Final AMT = 5*	Final AMT = 4*
<i>CAPS interview-intensity</i>		
<i>M</i> Baseline = 13	<i>M</i> Baseline = 21	<i>M</i> Baseline = 12
<i>SD</i> = 0.00	<i>SD</i> = 1.53	<i>SD</i> = 2.16
Final IT = 2*	Final IT = 4*	Final IT = 6
Final AMT = 2*	Final AMT = 5*	Final AMT = 4*

Note: CAPS = Clinician Administered Posttraumatic Stress Disorder Interview; all scores ranged from 0 (no intensity/frequency) to 28 (highest intensity/frequency); * = statistically significant decrease from Baseline score ($p < 0.05$).

frequency and intensity of intrusion and avoidance scores were noted for AMT more frequently than they were for IT. Despite this, the single-subject methodology used in this study does not allow for a clear statement of superiority of AMT. The significant reductions in scores usually occurred when the treatments were implemented first. These results indicate that both AMT and IT are effective in reducing intrusions and avoidance, and, thus, support both hypotheses. It should be noted that the order of the treatments may have had an effect on the results, in that the treatment which was implemented first caused greater decreases in scores than the treatment implemented second. However, counterbalancing was employed to control this. Finally, two participants (1 and 6) completed the follow-up scales. Their scores at follow-up were not significantly different from those following the second treatment, indicating maintenance of improvement.

3. Discussion

In the current study, it was believed that comparing AMT, a promising treatment for PTSD, with IT would constitute a fair preliminary test of the efficacy of AMT in treating combat-related PTSD. It appears that AMT proved to be at least comparable

in effectiveness to IT and may prove to enhance treatment of PTSD, either in combination with IT and other biopsychosocial interventions or alone (e.g., if a given patient does not consent to a more taxing exposure-based treatment). IT was found to be effective in reducing intrusions as well as avoidance, which runs counter to previous findings which suggested that IT does not produce such changes (Keane et al., 1989a). One hypothesis to account for this is that the removal of relaxation procedures from IT in this study resulted in increased exposure and, hence, greater extinction of conditioned emotional reactions.

The generalizability of these findings is limited by the following factors: (1) only six participants were treated. However, demographic and screening data indicate that the current participants were similar to those in previous larger outcome studies (Boudewyns et al., 1990; Boudewyns and Hyer, 1990; Cooper and Clum, 1989; Keane et al., 1989a). (2) Participants 1 and 2 received psychotropic medications during the study. Nonetheless, self-reported usage decreased over the course of both treatments and reductions in their scores appeared to be comparable to those demonstrated by the other participants. (3) The same therapist treated all of the participants. However, judges rated the implementation of both treatments as adequate.

4. Conclusion

A clear case cannot be made for the superiority of one treatment over the other. However, the current data suggest that AMT is at least as effective as IT for Vietnam combat-related PTSD. Therefore, in light of such a positive and new finding, further, larger-scale studies are needed to more definitively determine the effectiveness of AMT.

5. Acknowledgements

This study is based on the doctoral dissertation of the first author which was conducted under the supervision of the second author at Hofstra University, Hempstead, NY. The authors would like to express their appreciation to Dr. Patrick Boudewyns and Dr. Richard Suinn for reviewing audiotapes of Implosive Therapy and Anxiety Management Training sessions for treatment integrity. We also gratefully acknowledge the assistance of Dr. Marianne Sharsky in revising this article.

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