

BRIEF REPORT

A Pilot Study of Meditation for Mental Health Workers Following Hurricane Katrina

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This pilot study examined the effects of a manualized meditation intervention (called Inner Resources) for posttraumatic stress disorder (PTSD), depression, and anxiety symptoms among 20 African American and Caucasian mental health workers in New Orleans beginning 10 weeks after Hurricane Katrina. They participated in a 4-hour workshop followed by an 8-week home study program. Complete follow-up data were available for 15 participants. Results of intention-to-treat analyses indicated that participants' PTSD and anxiety symptoms significantly decreased over the 8 weeks of the intervention; these improvements were significantly correlated with the total number of minutes of daily meditation practice. The majority of participants reported good treatment adherence and improvements in well-being. These findings suggest that meditation may be a feasible, acceptable, and effective postdisaster intervention.

There has been little systematic research concerning effective postdisaster interventions, though there are indications that these interventions should address hyperarousal, which may be key in the development of posttraumatic stress disorder (PTSD; Marshall, Schell, Glynn, & Shetty, 2006) and may increase over time following disasters (Norris, Perilla, Riad, Kaniasty, & Lavizzo, 1999).

Meditation may be worthwhile as a postdisaster intervention. Baer (2003) pointed out that meditation may induce relaxation by promoting mindful awareness and acceptance of the practitioner's current state. Taylor and colleagues (2003) speculated that relaxation may help PTSD symptoms because it reduces hyperarousal, which, in turn, reduces reexperiencing distress and the related need for avoidance. It may be that several components of meditation practice are useful for traumatized persons. For example, the practice of breath awareness may reduce physiological arousal and

increase tolerance for negative emotions (Arch & Craske, 2006), making trauma reminders less distressing. The practice of letting go of thoughts and feelings as they arise may encourage decentering (Lau et al., 2006) and provide opportunities for beneficial cognitive restructuring. Additionally, our previous findings suggest that meditation may be helpful for depression and anxiety (Butler et al., 2008; Waelde, Thompson, & Gallagher-Thompson, 2004).

The current study was designed to examine the feasibility, acceptability, and effectiveness of a meditation intervention for symptoms of PTSD, depression, and anxiety following Hurricane Katrina among mental health workers in New Orleans. Because of the unique challenges of intervention following such a severe disaster, we modified the Inner Resources for Stress (IR; Waelde, 2005) intervention to include a 4-hour workshop and an 8-week home study program, rather than the standard 8-week, nine-session group intervention.

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METHOD

Participants

Participants were recruited by distributing a recruitment flyer among about 90 staff of a publicly funded mental health agency. Of the 32 persons who preregistered for the workshop, 20 attended. Of the 20 participants, there were 12 African Americans, 8 Caucasians, 17 women, 12 clinicians, and 8 administrative staff with significant patient contact responsibilities. The mean age was 49 ($SD = 11$); ages ranged from 31 to 67. Participants averaged 15 years of education ($SD = 3$), and all but one were employed fulltime. Most of the participants ($n = 13$) had annual household incomes of less than \$59,000 and were married or living as married ($n = 11$). All participants were residents of the New Orleans area before the hurricane.

Five of the 20 participants did not have complete postbaseline assessments because two changed addresses and could not be located and three reported that their completed packets were lost in the mail.

Measures

A set of disaster exposure questions adapted from Norris et al. (1999) assessed exposure to threat, injury, and loss of a family member and the extent of hurricane-related property damage. The PTSD Checklist-Specific Version (PCL-S; Weathers, Litz, Herman, Huska, & Keane, 1993), which assessed PTSD symptoms in relation to the hurricane, has a total score of 44 as the clinical cutoff for nonmilitary samples (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). The Center for Epidemiological Studies-Depression Scale (CES-D; Radloff, 1977) has a clinical cutoff of 16 and was used to assess depressive symptoms. The 20-item state portion of the State-Trait Anxiety Inventory (STAI-S; Spielberger, Sydeman, & Maruish, 1994) assessed current intensity of anxiety. The PCL-S, CES-D, and STAI had Cronbach's alphas of .76, .82, and .66, respectively, in the current study. Participants also completed a demographics questionnaire. The Daily Practice Log records minutes per day of each meditation practice during the past week. The Follow-up Questionnaire asked participants to rate their improvement as a result of the intervention in overall well-being, stress coping, frustration tolerance, activity level, depression, anger, physical pain, sleep problems, and fatigue.

Procedure

Ten weeks after Hurricane Katrina, we offered a meditation retreat in downtown New Orleans. During the first hour, participants completed a self-report baseline assessment and then attended a 4-hour meditation workshop. The workshop included instruction and guided practice in meditation, breathing, guided breath-focused imagery, mantra repetition, and letting go of thoughts,

feelings, and sensations as they arise, rather than trying to resist them or engage in them. The 8-week home study program materials consisted of the IR Participant Manual with four audiorecordings of guided meditations. Target adherence was set at 30 minutes of meditation a day for 6 days per week. Participants completed midtreatment and posttreatment mail-in assessments at 3- and 8-weeks postworkshop, respectively.

Data Analysis

Intention-to-treat analyses used random regression to compute the intercept and slope of outcome measures over time for each participant. Participants with only baseline data were assumed to have a slope of zero, meaning that there was no change in scores across the three assessments. One-sample t tests were then used to test whether the mean slope differed from zero. Treatment effect size (based on Cohen's d ; Cohen, 1988) was calculated as the difference between the predicted value of each outcome at baseline and posttreatment divided by the predicted posttreatment SD . Predicted values were calculated using the intercepts and slopes from the random regression analysis.

RESULTS

Table 1 presents the means and standard deviations of the symptom variables. Of the 20 participants who completed the baseline assessment, 14 and 5 scored above the clinical cutoffs for depression and PTSD, respectively. Six participants stayed in the New Orleans area during the hurricane, 10 believed their lives were in danger when the hurricane struck, 7 had a hurricane-related injury or illness, 10 had a household member with a hurricane-related illness or injury, and 4 had a family member or close friend who died as a result of the hurricane. The majority ($n = 12$) reported "much" or "enormous" hurricane-related property damage, 40% ($n = 8$) had "some" or "a little" damage.

Completers and dropouts did not differ from each other on any of the demographic, symptom, or exposure measures, except that dropouts were more likely than completers to have stayed in the New Orleans area during Hurricane Katrina (80% vs. 13.3%, respectively, Fisher's exact test $p < .05$).

As shown in Table 1, the mean slopes of total PTSD, reexperiencing, hyperarousal, and state anxiety symptoms were significantly different from zero across the three time points, indicating that participants' scores significantly decreased over the 8 weeks of the intervention. Slopes for avoidance and depression were in the expected directions, but were not statistically different from zero. Using Cohen's (1988) conventions, all treatment effect sizes were in the medium range, except for depression, which was in the small range.

Almost all participants (93%, $n = 14$) reported feeling "somewhat better" or "much better" than before the study in terms of overall well being as a result of the intervention. More than

Table 1. Observed Means and Standard Deviations at Each Assessment

Variable	Baseline <i>N</i> = 20		Midtreatment <i>n</i> = 15		Posttreatment <i>n</i> = 15		<i>t</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
PCL-S Total	36.60	9.97	34.67	13.82	30.57	9.75	-2.57**	.38
PCL-S Reexperiencing	8.79	2.99	8.20	3.80	7.33	2.53	-2.43*	.29
PCL-S Avoidance	14.99	5.59	14.93	6.12	13.40	4.21	-1.25	.31
PCL-S Hyperarousal	12.74	4.54	11.53	5.04	9.80	3.84	-2.59**	.37
CES-D Depression	22.39	8.50	22.07	7.93	20.71	7.49	<1	.12
STAI State Anxiety	47.52	11.03	46.91	13.70	38.87	14.98	-2.16*	.45

Note. PCL-S = PTSD Checklist-Specific Version; CES-D = Center for Epidemiology of Depression Scale; STAI = State-Trait Anxiety Inventory. Intention-to-treat one-tailed one sample *t* tests examined whether slope of change across three assessments differed from zero. Cohen's *d* calculated as the difference between predicted values of outcomes at baseline and posttreatment divided by the predicted posttreatment *SD*.

p* < .05. *p* < .01.

60% (*n* = 9) reported improvements in stress coping, frustration tolerance, activity level, depression, and 47% (*n* = 7) reported improved ability to deal with anger. Less than 40% (*n* = 6) reported improvements in physical pain, sleep problems, and fatigue.

The mean total minutes of meditation practice was 898 (*SD* = 902), and the range was 0 to 3,325 minutes (including values of 0 for those five participants with no postbaseline data). Participants averaged 112 minutes (*SD* = 113) of practice per week. Eight of the 15 completers reported practicing more than the recommended 180 minutes per week. Intention-to-treat analyses were conducted to determine whether the amount of total practice was associated with the degree of symptom improvement across the 8 weeks of the intervention. The slopes of total PTSD and state anxiety symptoms were correlated with the total number of minutes of practice across the 8 weeks ($r = -.40$, $p < .05$, and $r = -.38$, $p < .05$, respectively), indicating that more meditation practice was associated with greater improvements in total PTSD and state anxiety symptoms.

DISCUSSION

These findings demonstrate that participants in a one-session group meditation intervention followed by 8 weeks of home practice reported reduced total PTSD symptoms, PTSD-related reexperiencing and hyperarousal, and state anxiety across the 8 weeks of the intervention. Contrary to expectations, there was no reported change in depression among these highly hurricane-exposed African American and Caucasian mental health workers during the 8-week study period. It may be that participants' depression was related to the ongoing stress of living in a disaster zone and the brief format of the intervention was not adequate to address these ongoing stressors.

Indications of the feasibility and acceptability of the intervention were drawn from information about participant attrition,

treatment adherence, and ratings of subjective improvement as a result of the intervention. The attrition rate of 25% was similar to previous PTSD treatment studies (Monson et al., 2006; Taylor et al., 2003). Intention-to-treat analyses indicated that participants averaged more than 112 minutes of meditation practice per week, which was less than the recommended amount of 180 minutes, but more than the average weekly practice of 91 minutes by family dementia caregivers in a previous study (Waelde et al., 2004). The majority of completers reported practicing more than the recommended amount and experiencing subjective improvements in well being. Taken together, these data suggest that the intervention was both feasible and acceptable.

The current study does not address the mechanisms whereby meditation might improve symptoms of PTSD and anxiety. Breath awareness and relaxation in meditation may reduce hyperarousal, which, in turn, reduces distress associated with reminders of the trauma. In addition, the emphasis on actively letting go of thoughts, feelings, and sensations as they arise may also decrease the distress associated with reexperiencing and encourage cognitive restructuring.

The lack of a control group is a serious limitation of the study. The observed symptom improvements may have been a result of natural recovery rather than due to the effects of the intervention. It is encouraging that the total number of minutes of meditation practice was correlated with improvements in total PTSD and anxiety symptoms, suggesting that improvements in symptoms were related to increased use of the skills taught in the intervention.

It is possible that research participants and nonparticipants differed in important ways. About one third of the invited agency staff preregistered for the workshop and 63% of those who preregistered attended. It may be that participants were more resourceful and likely to recover than nonparticipants. However, a previous study of meditation found that participants and nonparticipants did not differ in PTSD severity (Simpson et al., 2007).

A randomized controlled trial is needed to distinguish treatment effects from natural recovery.

An additional limitation of the study is that outcome measures were assessed through self-report measures that were completed outside of a standardized assessment context. Clinician-administered measures would likely provide more accurate assessment of treatment outcomes.

These findings suggest that Inner Resources for Stress may be a feasible, acceptable, and effective intervention for mental health workers following a disaster. If meditation is effective for reducing postdisaster PTSD and anxiety symptoms, it may be a safe and cost-effective way to address postdisaster adjustment (Waelde, in press). Future research should examine the effects of meditation among diverse groups relative to randomized control conditions.

REFERENCES

- Arch, J. J., & Craske, M. G. (2006). Mechanisms of mindfulness: Emotion regulation following a focused breathing induction. *Behaviour Research and Therapy*, 44, 1849–1858.
- Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice*, 10, 125–143.
- Blanchard, E. B., Jones-Alexander, J., Buckley, T. C., & Forneris, C. A. (1996). Psychometric properties of the PTSD Checklist (PCL). *Behaviour Research and Therapy*, 34, 669–673.
- Butler, L. D., Waelde, L. C., Hastings, A., Chen, X., Symons, B., Marshall, J., et al. (2008). Meditation with yoga, group therapy with hypnosis, and psychoeducation for long-term depressed mood: A randomized pilot trial. *Journal of Clinical Psychology*, 64, 806–820.
- Cohen, J. (1988). *Statistical power analyses for the social sciences* (2nd ed.). Hillsdale, N.J.: Erlbaum.
- Lau, M. A., Bishop, S. R., Segal, Z. V., Buis, T., Anderson, N. D., Carlson, L., et al. (2006). The Toronto Mindfulness Scale: Development and validation. *Journal of Clinical Psychology*, 62, 1445–1467.
- Marshall, G. N., Schell, T. L., Glynn, S. M., & Shetty, V. (2006). The role of hyperarousal in the manifestation of posttraumatic psychological distress following injury. *Journal of Abnormal Psychology*, 115, 624–628.
- Monson, C. M., Schnurr, P. P., Resick, P. A., Friedman, M. J., Young-Xu, Y., & Stevens, S. P. (2006). Cognitive processing therapy for veterans with military-related posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology*, 74, 898–907.
- Norris, F. H., Perilla, J. L., Riad, J. K., Kaniasty, K., & Lavizzo, E. A. (1999). Stability and change in stress, resources, and psychological distress following natural disaster: Findings from Hurricane Andrew. *Anxiety, Stress & Coping*, 12, 363–396.
- Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385–401.
- Simpson, T. L., Kaysen, D., Bowen, S., MacPherson, L. M., Chawla, N., Blume, A., et al. (2007). PTSD symptoms, substance use, and Vipassana meditation among incarcerated individuals. *Journal of Traumatic Stress*, 20, 239–249.
- Spielberger, C. D., Sydeman, S. J., & Maruish, M. E. (1994). *State-Trait Anxiety Inventory and State-Trait Anger Expression Inventory*. Hillsdale, NJ: Erlbaum.
- Taylor, S., Thordarson, D. S., Maxfield, L., Fedoroff, I. C., Lovell, K., & Ogradniczuk, J. (2003). Comparative efficacy, speed, and adverse effects of three PTSD treatments: Exposure therapy, EMDR, and relaxation training. *Journal of Consulting and Clinical Psychology*, 71, 330–338.
- Waelde, L. C. (2005). *Inner Resources for Stress: Treatment manual and materials*. (Available from the Inner Resources Center, Pacific Graduate School of Psychology, 405 Broadway Street, Redwood City, CA 94063).
- Waelde, L. C. (2008). Meditation. In G. Reyes, J. D. Elhai, & J. D. Ford (Eds.), *Encyclopedia of psychological trauma*. Hoboken, New Jersey: John Wiley & Sons.
- Waelde, L. C., Thompson, L., & Gallagher-Thompson, D. (2004). A pilot study of a yoga and meditation intervention for dementia caregiver stress. *Journal of Clinical Psychology*, 60, 677–687.
- Weathers, F. W., Litz, B., Herman, D., Huska, J., & Keane, T. (1993, October). The PTSD Checklist (PCL): Reliability, validity, and diagnostic utility. Paper presented at the 11th Annual Meeting of the International Society for Traumatic Stress Studies, San Antonio, TX.