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Mindfulness-based Stress Reduction for Generalized Anxiety Disorder: Does Pre-treatment Symptom Severity Relate to Clinical Outcomes?

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Abstract

Mindfulness-Based Stress Reduction is an evidence-based meditation training intervention that significantly reduced symptoms of depression, anxiety, and stress for patients suffering from a wide range of medical conditions. MBSR also appears effective for psychiatric outpatients seeking relief from anxiety disorders and comorbid depression. In the current investigation, ten patients enrolled in a mental health clinic MBSR program who reported mild, moderate, or severe generalized anxiety disorder (GAD) before the intervention completed standardized measures of GAD, worry, depression, anxious arousal, and stress immediately before and immediately after the 8-week MBSR program. Results demonstrated clinically significant improvement on all measures for the sample as a whole, and observed clinical improvements were not limited to those patients reporting only mild or moderate GAD symptoms before the intervention. Severe GAD patients scored near or within the clinical range on all measures before MBSR yet fell within normal limits on all measures at the final MBSR session. MBSR may be a viable alternative or adjunctive intervention approach for patients suffering from varying levels of GAD severity.

Keywords: Generalized anxiety disorder; Mindfulness-based stress reduction; Worry; Depression; Anxiety

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Introduction

Jon Kabat-Zinn first introduced Mindfulness-Based Stress Reduction (MBSR) to the field of medicine in a general hospital setting. His Stress Reduction Clinic, founded in 1979 at the University of Massachusetts (UMass) Medical School, delivered this eight-week group intervention to a wide variety of medical patients coping with the stress of chronic pain and illness or with stressful life circumstances compromising their physical health. During eight weekly group sessions and one full-day practice retreat, MBSR instructors teach formal mindfulness meditation and yoga practices over 25-30 hours of formal instruction. Patients also apply informal mindfulness practices to real-life daily activities and stressful situations between sessions. Preliminary outcome research conducted within the original UMass Medical School program provided early empirical support for MBSR in the management of chronic pain [1,2]. Subsequent randomized controlled research has established an evidence base for MBSR across a variety of chronic medical conditions (e.g., [3]), and MBSR has been implemented in hundreds of medical settings worldwide to assist patients with medical disease management.

It is interesting to note that many of the outcome measures used in MBSR medical patient outcome research assess symptoms of depression, anxiety, stress, and related measures of subjective distress. In their large meta-analytic review of 26 MBSR randomized controlled outcome research studies, deVibe et al. [4] found that MBSR yielded medium effect sizes for measures of anxiety (Hedges' g-value of .53), depression (Hedges' g-value of .54), and stress/distress (Hedges' g-value of .56) across various patient groups. Likewise, Hofmann et al. [5] conducted meta-analyses of MBSR outcome research that specifically included anxiety and/or depression symptom measures. Results from 20 identified MBSR studies representing a variety of behavioral and medical disorders yielded Hedges' g effect sizes of 0.49 for depression symptom measures and 0.55 for anxiety symptom measures, providing further evidence that MBSR effectively improved anxiety and depression symptoms among heterogeneous patient groups. Furthermore, early MBSR research conducted at the original UMass Medical School clinic suggested that MBSR effectively treated clinically

Table 1: Means and standard deviations for outcome measures administered during the first and the last MBSR session by GAD severity category.

Measure	Session 1 Mean (SD)	Session 8 Mean (SD)
Mild GAD: GAD-7 (n = 3)	7.33 (2.08)	1.33 (1.53)
Moderate GAD: GAD-7 (n = 1)	13.00	2.00
Severe GAD: GAD-7 (n = 6)	17.83 (1.72)	6.67 (1.97)
Mild GAD: PSWQ (n = 3)	48.00 (10.44)	38.33 (5.13)
Moderate GAD: PSWQ (n = 1)	51.00	39.00
Severe GAD: PSWQ (n = 6)	68.33 (10.44)	56.00 (18.96)
Mild GAD: DASS-Depression (n = 3)	12.00 (15.62)	3.33 (4.16)
Moderate GAD: DASS-Depression (n = 1)	10.00	4.00
Severe GAD: DASS-Depression (n = 6)	11.00 (7.46)	4.00 (2.53)
Mild GAD: DASS-Anxiety (n = 3)	7.33 (8.08)	3.33 (4.16)
Moderate GAD: DASS-Anxiety (n = 1)	20.00	8.00
Severe GAD: DASS-Anxiety (n = 6)	16.67 (9.77)	6.67 (5.61)
Mild GAD: DASS-Stress (n = 3)	14.00 (6.93)	9.33 (8.08)
Moderate GAD: DASS-Stress (n = 1)	12.00	8.00
Severe GAD: DASS-Stress (n = 6)	29.00 (3.74)	15.00 (3.74)

Note: GAD-7: Generalized Anxiety Disorder 7 item measure; PSWQ: Penn State Worry Questionnaire; DASS-Depression: Depression and Anxiety Stress Scales, 21 item version – Depression subscale; DASS-Anxiety: Depression and Anxiety Stress Scales, 21 item version – Anxiety subscale; DASS-Stress: Depression and Anxiety Stress Scales, 21 item version – Stress subscale.

severe anxiety disorders as well. MBSR effectively reduced clinical anxiety and depression symptoms among patients diagnosed with generalized anxiety disorder (GAD) and/or panic disorder with or without agoraphobia [6], and three-year follow up results revealed that patients maintained these gains obtained in the initial study [7]. Later randomized controlled research with diagnosed anxiety disorder patient groups supported the efficacy of MBSR for social anxiety disorder [8] and a mixed patient sample diagnosed with social anxiety disorder, GAD, and/or panic disorder [9]. Results from these controlled outcome research investigations appear to generalize to real-world mental health outpatient clinics. Outpatients who enrolled in a MBSR program outside the research context also reported significant reductions on a range of clinical anxiety and depression symptom measures [10], and a case study conducted in this setting revealed clinically significant amelioration of GAD diagnosis and comorbid depression [11].

It is unclear, however, whether patients diagnosed with severe levels of GAD are as likely to benefit from MBSR as patients reporting GAD symptoms to a lesser degree. Conventional wisdom may suggest that patients suffering from severe GAD may require intensive individual psychotherapy and/or psychotropic medication to recover fully, yet MBSR research consistently has demonstrated powerful clinical benefits of this brief and cost-effective intervention. In the current investigation, exploratory analyses were conducted with clinical data obtained from a subsample of mental health outpatients seeking MBSR who initially screened positive for GAD diagnosis. Patients reporting mild, moderate, or severe GAD symptomatology before MBSR were compared on standardized clinical outcome measures of worry, comorbid depression, anxious arousal, and stress at the beginning and at the end of MBSR intervention.

Methods

Participants

This research was conducted in an outpatient mental health clinic setting, located within a university-based psychological services center, in which individuals from the local community regularly seek services for a variety of behavioral health concerns for a sliding scale fee. Patients presenting with symptoms of anxiety, depression, or other stress-related concerns enrolled in the clinic's MBSR program. Clinic patients decided to enroll in MBSR either because they were referred

by a mental health professional within the community or because they were self-referred after learning about the MBSR program. All patients completed a battery of self-report measures during the first and final MBSR session to monitor individual clinical progress and to conduct ongoing program evaluation. After a screening measure of GAD was added to this battery, ten patients screening positive for mild (n = 3), moderate (n = 1), or severe (n = 6) GAD who completed post-intervention measures were identified for subsequent analyses. Of these ten patients, eight were women and two were men. Eight patients self-identified as Caucasian/White, one as African American, and one as Native American. Patient ages ranged from 24 to 64 years old (mean age of 40.40, *SD* = 13.90).

Measures

Generalized Anxiety Disorder 7: (GAD-7; [12]): The GAD-7 is a brief self-report measure of GAD symptoms designed to screen for probable GAD in primary care medical settings. Respondents rate the frequency of seven specific GAD symptoms over the last two weeks on a 0-3 point Likert scale. The total of the seven items result in scores ranging from zero to 21. Evidence of excellent internal consistency, good test-retest reliability, and validity was demonstrated, with an optimal cut point of 10 correctly classifying patients diagnosed as GAD 89% of the time and correctly excluding patients without GAD in 82% of cases [12]. Scores on the GAD-7 can be used to classify patients into GAD severity categories of Minimal (0-4), Mild (5-9), Moderate (10-14), or Severe (15-21).

Penn State Worry Questionnaire (PSWQ; [13]): The PSWQ is a widely used 16-item measure of trait worry with demonstrated excellent internal consistency, good test-retest reliability, and construct validity [13]. Respondents rate each item, including five reverse-scored items, on a five-point Likert scale. Total scores range from 16 to 80 with higher scores indicating a greater tendency to worry excessively and intensely.

Depression Anxiety Stress Scales 21-item version (DASS21; [14]): The DASS21 is a widely used measure that assesses the core symptoms of depression, acute anxiety in the form of anxious arousal, and stress-related tension. Patients respond to items using a Likert scale ranging from zero to three, resulting in separate score for each subscale. Good internal consistency, two-week temporal stability, and a valid factor structure for each scale have been demonstrated among clinical samples [15].

Procedure

After enrollment into the MBSR program and consenting to treatment, patients arrived at their first MBSR group session and completed an assessment battery of self-report questionnaire measures. After assessment packet completion, patients were invited to participate in voluntary clinical research by allowing the same assessment questionnaires used to track their individual progress in the program to be de-identified and combined with other participants' scores, per the university's Institutional Review Board (IRB)-approved protocol. The author provided all MBSR sessions to all patient participants, delivered in cycles of the 8-week MBSR curriculum to groups of six to ten participants per cycle. The MBSR instructor is a licensed psychologist who received her Ph.D. in clinical psychology in 1999. She had over ten years of personal meditation practice and attended two to six extended residential silent meditation retreats taught in the insight meditation (*vipassana*) tradition at the time of MBSR delivery. She also had completed the foundational training programs in MBSR provided by the Oasis

Institute for Mindfulness-Based Professional Education at the UMass Center for Mindfulness in Medicine, Health Care, and Society. MBSR delivery followed the standard UMass Center for Mindfulness 2009 Curriculum Guide [16], described in greater detail elsewhere [11]. At the beginning of the first MBSR session, all patients completed a battery of self-report assessment measures. Patients repeated this assessment during the final MBSR session. After data from all patients consenting to research participation were de-identified and entered for analysis, data from only those participants who completed the GAD-7 at both time points and who scored at least in the mild GAD range on the GAD-7 (i.e., score of 5 or greater) were selected for subsequent analysis.

Results

Of the ten participants selected for these exploratory analyses, three scored in the mild GAD range, one participant scored in the moderate GAD range, and six scored in the severe GAD range before the MBSR intervention. Across the full sample, GAD-7 scores averaged 14.20 ($SD = 5.22$) before MBSR and fell to 4.60 ($SD = 3.13$) at the final MBSR session, reflecting a statistically significant reduction in GAD symptoms [$t(9) = 9.69, p < .0001$].

Across the full sample, PSWQ scores also significantly reduced from a mean of 60.50 ($SD = 13.71$) to 49.00 ($SD = 16.95$) [$t(9) = 3.84, p < .004$] following MBSR. However, repeated measures analysis of variance (ANOVA) with GAD severity category as a between subjects factor revealed no significant time by severity category interaction effect ($p < .94$), demonstrating that GAD severity was unrelated to this observed decline in trait worry. Inspection of PSWQ means by severity category reflects this result, suggesting that severe GAD participants benefitted from MBSR equivalently to their less severe counterparts (Table 1 for pre and post score means and standard deviations for each GAD severity category).

Similarly, a statistically significant reduction in depression measure scores pre ($M = 11.20; SD = 9.25$) to post ($M = 3.8; SD = 2.74$) MBSR was found for the full sample [$t(9) = 3.23, p < .010$], but no significant time by severity category interaction effect ($p < .94$) emerged from the repeated measures ANOVA with GAD severity category as a between subjects factor. Likewise, for the anxiety measure capturing symptoms of anxious arousal, statistically significant reductions in anxiety (Pre: $M = 14.20; SD = 9.54$; Post: $M = 5.80; SD = 4.94$) were found for the full sample [$t(9) = 3.04, p < .014$]. However, no significant time by severity category interaction effect ($p < .62$) emerged from the repeated measures ANOVA with GAD severity category as a between subjects factor. Stress measure scores also significantly reduced following MBSR for the full sample (Pre: $M = 22.80; SD = 9.10$; Post: $M = 12.60; SD = 5.66$) [$t(9) = 4.68, p < .001$]. In addition, the repeated measures ANOVA with GAD severity category as a between subjects factor revealed a nonsignificant trend for a time by severity category interaction effect ($p < .084$), suggesting that GAD severity may have been weakly related to the rate of decline in the stress measure reflecting general tension. Inspection of stress scale score means for each severity category reveals that the severe GAD participants reported a greater reduction in stress scale scores when compared to moderate and mild GAD participants (Table 1 for means and standard deviations for all outcome measures by GAD severity category).

Discussion

As expected, this subsample of clinic patients reporting at least

mild GAD symptoms before the MBSR intervention exhibited statistically significant reductions in GAD symptoms, worry, depression, anxious arousal, and stress following the intervention. Importantly, these reductions occurred for severe GAD patients as well as for less severe patients. One of the six severe GAD patients reported only minimal GAD symptoms at the final MBSR session, and the remaining five severe GAD patients reported mild-range GAD symptoms following MBSR. These clinically significant reductions in GAD symptoms were accompanied by notable reductions on related measures of worry, depression, anxious arousal, and stress for the severe GAD patients as well. Inspection of severe GAD patient means reveals that depression, anxiety, and stress scale scores were near or above one standard deviation above published nonclinical sample norms [14] before MBSR, but all DASS scale scores were well within normal limits at the end of the intervention. Likewise, PSWQ scale scores for severe GAD patients were at the GAD clinical range [17] before MBSR and fell within normal limits following MBSR. The lack of statistically significant time by GAD severity category interaction effects in the repeated measures ANOVA model analyses further support the conclusion that severe GAD patients benefitted from MBSR as much as less severe patients. Furthermore, the nonsignificant trend found for stress scale scores suggests that severe GAD patients may have enjoyed even greater symptom reduction in this area. However, it is also possible that this trend in the data simply reflects a floor effect, as less severe GAD patients reported lower stress scale scores initially.

Despite the advantages of conducting research in this naturalistic clinic setting, the lack of methodological rigor limits conclusions that can be drawn from these results. Additional research conducted with larger samples of GAD patients diagnosed following intensive assessment procedures in randomized controlled trials are needed to establish the efficacy of MBSR for GAD further. It is also unclear from these data whether MBSR is sufficient as a stand-alone alternative intervention approach for severe GAD or whether MBSR should be considered as an adjunct to concurrent psychotherapy and/or pharmacological treatment. Nevertheless, preliminary results from these exploratory analyses suggest that MBSR may serve as a potentially effective intervention option for patients suffering from all levels of GAD severity.

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