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Effects of Mindfulness-based Stress Reduction on Anxiety & Depression in Primary Care Patients

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**EFFECTS OF MINDFULNESS-BASED STRESS REDUCTION
ON ANXIETY & DEPRESSION IN PRIMARY CARE
PATIENTS**

BY

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THESIS

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ABSTRACT

The objective of this study was to examine effects of mindfulness-based stress reduction (MBSR) on the ability to decrease anxiety and depression and increase mindfulness compared to cognitive-behavioral stress management (CBSM). Thirty-five subjects were recruited from a community healthcare center and took part in MBSR (n = 21) and CBSM (n = 14) groups. There were no initial differences between MBSR and CBSM subjects on demographics including age, gender, education, and income. MBSR was an 8-week course using meditation, gentle yoga, and body scanning exercises to increase mindfulness. CBSM was an 8-week course using cognitive and behavioral techniques to change thinking and reduce distress. Anxiety, depression, and mindfulness were assessed before and after each group. An analysis of covariance (ANCOVA) was used to examine initial group differences between MBSR and CBSM and between Latinos and Non-Latino Whites (NLWs). Effect sizes and paired t-tests were used to examine changes in pre to post measures within groups and ethnicities. Correlational analyses were used to examine changes in anxiety, depression, and mindfulness, as well as changes in mindfulness subscales. Chi-square analyses examined dropout rates between Latino and NLW subjects. Results showed no significant differences in depression and anxiety when comparing MBSR and CBSM groups, but effect sizes showed significant reductions in anxiety and depression and increases in mindfulness. MBSR also showed significant reductions in all three variables, while CBSM showed reductions in anxiety depression, but no changes in mindfulness. NLWs showed reductions in both anxiety and depression, while Latinos decreased only in depression. NLWs showed large effects on all variables, while Latinos showed small increases in mindfulness, medium reductions in anxiety, and large reductions in depression. There were significant correlations between reductions in anxiety and increases in mindfulness and between reductions in depression and increases in mindfulness. There were no significant differences in attrition between groups or ethnicities. Future research should compare cognitive-behavioral and mindfulness-based interventions in a large sample. Research may also benefit from studying the mechanisms involved in mindfulness instead of focusing on group differences.

Keywords: MBSR, CBSM, anxiety, depression, primary care

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Chapter 1

Introduction

Mind-body medicine focuses on the interaction of the brain, mind, and body and how these interactions affect health. Mind-body interventions include cognitive-behavioral therapy (CBT), meditation, relaxation, visual imagery, yoga, biofeedback, tai chi, qi gong, group support, and spirituality (NCCAM, 2007). While CBT is the most researched of all mind-body interventions, Mindfulness-Based Stress Reduction (MBSR) is a rapidly growing area of research interest.

Cognitive-behavioral Stress Management

Cognitive behavioral approaches are based on the theory that cognitions, emotions, and behavior interact and that cognitions influence our emotions and behavior (Ellis, 1976; Ellis, 2001; Beck, 1975; Beck, 1993d). A primary goal of CBT is to enable people to replace “irrational,” “unrealistic,” or “illogical” thoughts with more “rational,” “realistic,” or “logical” ones. This theory posits that improved thinking will lead to fewer distressing emotions and less maladaptive behavior. This may also decrease the stress response and improve health behaviors resulting in better physical health outcomes (Meichenbaum, 1996; Wisniewski & Wagner, 2003). CBT also uses behavioral techniques such as relaxation exercises to reduce emotional distress.

CBT interventions have been associated with improvement on a variety of health-related outcomes. Butler, Chapman, Forman, and Beck (2006) examined 16 meta-analyses of the effects of CBT and found improvements on a variety of problems including major depression, generalized anxiety disorder, and posttraumatic stress

disorder. There is also evidence that cognitive behavioral interventions may be effective in treating or improving quality of life for irritable bowel syndrome (Tirch & Radnitz, 1997), chronic fatigue syndrome (Deale, Husain, Chalder, & Wesseley, 2001), substance abuse (Project Match, 1997), and immune function for cancer patients (McGregor, Antoni, & Boyers, 2004).

CBSM is an adapted intervention developed to focus more specifically on issues related to mental health. The current intervention used a protocol adapted from Michael Antoni's manual "CBSM for Individuals with HIV" (2007). In this intervention, participants learn about how stress impacts physical health. By combining stress management with relaxation training, participants learn a number of different skills to manage their stress. Each group meeting introduces a new relaxation method, such as progressive muscle relaxation, body scan, or visualization. Stress management skills include cognitive restructuring, coping strategies, and establishing a strong social network. By the end of the program, participants are equipped with a variety of inter-related techniques that they can use to reduce stress and improve their quality of life. Participants are given weekly homework assignments to enhance learning. Due to its role as an established treatment for increasing both physical and mental health, CBSM acted as an active control for the current study.

Mindfulness Interventions

The practice of mindfulness meditation is rooted in the ancient tradition of Theravada Buddhist texts and teachings as a means to cultivate greater awareness and insight. This practice has been adopted by the field of psychology and has been shown to

be effective in reducing many forms of psychological distress including generalized anxiety disorder (Kabat-Zinn, Massion, Kristeller, & Peterson, 1992), social anxiety disorder (Goldin & Gross; 2010), depression (Kumar, Feldman, & Hayes, 2008; Shapiro, Schwartz, & Bonner 1998; Speca, Carlson, Goodey, & Angen, 2000), and parasuicidal behavior (Linehan et al., 1991). A recent meta-analysis reported robust effects for the impact of mindfulness training on anxiety and depression (Hofmann, Sawyer, Witt, & Oh, 2010). Other studies have shown that mindfulness training can lead to an increased sense of overall well-being (Lau, 2006; Shapiro, Brown, Thoresen, & Plante, 2011) as well as increased mindfulness (Cohen- Katz, Wiley, Capuano, Baker, & Shapiro, 2005; Shapiro, Brown, & Biegel, 2007). When practiced in a clinical setting, mindfulness techniques including sitting and walking meditation, deep breathing, body scan relaxation, hatha yoga, are most often taught without mention of their Buddhist origins (Kabat-Zinn, 1982).

Although there have been decades of research on the subject, there continue to be debates on a consensual definition of mindfulness (Dimidjian & Linehan, 2003). In addition, the mechanisms involved in the effect of mindfulness remain unclear. Brown and Ryan have defined mindfulness as ‘consciously attending to one’s moment-to-moment experience’. They have developed an instrument to measure it, called the Mindfulness Attention Awareness Scale (MAAS). Shapiro, Carlston, Astin, & Freedman propose that mindfulness involves three things: the intention to practice mindfulness, attention to the present moment, and an attitude of kind, open acceptance of all experiences (2006). They contend that the integration of these three skills can lead to a fundamental shift in perspective they call ‘reperceiving’.

One of the clearest definitions was put forth by Bishop who defined the study of mindfulness as including both the ‘ability to intentionally regulate attention’ and to ‘maintain an attitude of acceptance and receptivity to one’s experience’ (2004). In order to develop a better understanding of mindfulness as a construct, a collection of mindfulness measures were analyzed with results indicating measures were assessing heterogeneous and overlapping constructs, and defined mindfulness as containing four factors: present-centered attention, acceptance of experience, clarity about one’s internal experience, and ability to manage negative emotions (Coffey, Hartman, Fredrickson, 2010). The lack of cohesive findings in this study highlights the importance of continuing to develop the construct of mindfulness.

Mindfulness- Based Stress Reduction

MBSR is a group intervention focused on the acquisition of meditation skills to decrease stress and increase mental and physical health. The intervention is often held in an 8-week course for 2.5 hours each week with up to 30 subjects. The goal is to learn meditation skills during group sessions and practice throughout the week at home most days, working up to 45 minutes a day either with or without an instructional CD of guided skills. In addition to learning specific meditation techniques, the course encourages an attitude of non-judgment and acceptance toward one’s experience (Brantley, 2005).

According to Grossman’s 2004 meta-analysis, mindfulness has a medium effect size of $d = .54$ on standardized measures of physical and mental well-being. This meta-analysis included studies covered a wide spectrum of clinical populations including pain,

cancer, heart disease, depression, and anxiety. Due to generally small effect sizes in research on treatment efficacy, Grossman's analysis suggests that MBSR is a promising intervention. Based on these findings as well as other controlled studies conducted, it is likely to be characterized as a "probably efficacious" Empirically Supported Treatment or Evidence-Based Practice (Task Force on Promotion and Dissemination of Psychological Procedures, 1995).

A review of the effect of MBSR on mental health symptoms of adults with a chronic medical disease found small effects on changes in depression (.26), anxiety (.24), and psychological distress (.32; Bohlmeijer, 2010). A more recent meta-analysis has been conducted by the Substance Use and Mental Health Services Administration (SAMHSA) on the effect of MBSR on stress and anxiety symptoms, mood disturbance, depression symptoms, self-esteem, and general mental health symptoms and function. The intervention received a 3.2 on a 4.0 scale measuring research quality (2012). Criteria were based on reliability and validity of measures, intervention fidelity, missing data, attrition, potential confounding variables, and the appropriateness of the analyses utilized.

Anxiety research has found MBSR to be effective in increasing the ability to self-regulate affect (Tacon, McComb, Caldera, & Randolph, 2003) as well as perception of control (Astin, 1997). Two different studies found significant decreases in anxiety in medical students as compared to control subjects (Shapiro, et al., 1998; Rosenzweig, Reibel, Greeson, Brainard, & Hojat, 2003). MBSR has also been found to decrease avoidance behaviors and the frequency of panic attacks in individuals with panic disorder (Miller, Fletcher, Kabat-Zinn, 1995).

Depressive symptoms have been reduced with MBSR in a number of randomized controlled trials. One study found that MBSR could reduce reports of overall psychological distress including depression. These results were replicated in a wait-list control group and held across different experiments (Shapiro, et al., 1998). Another study found a significant improvement of depressive symptoms as measured by the Beck Depression Inventory at post-intervention and a two-month follow-up in a sample of women with fibromyalgia as compared to a wait-list control (Sephton, Salmon, Weisbrecker, 2007). Differences between the MBSR and wait-list control groups were associated with a medium effect size.

There is a considerable amount of research on the efficacy of MBSR in chronic pain. A recent meta-analysis of twenty-two studies that reported effects of acceptance-based interventions on mental and physical health of pain patients was conducted. The primary outcome measures were pain intensity and depression. The secondary outcomes were anxiety, physical well-being, and quality of life. An effect size of 0.37 for pain and 0.32 for depression was found in the controlled studies. The quality of the studies was not found to effects treatment outcome. Researchers concluded that MBSR is not presently superior to CBT, but can be a good alternative (Veehof, Oskam, Schreurs, & Bohlmeijer, 2011).

Two controlled studies compared MBSR or MBSR plus massage versus a wait-list control group for chronic pain patients (Morone, Greco, & Weiner, 2008; Plews-Ogan, et al., 2005). The MBSR groups reported less pain and psychological distress, significantly increased physical functioning and a greater ability to accept pain in comparison to a wait-list control group. MBSR has also been successful in randomized controlled

longitudinal study of a variety of chronic illnesses, maintaining a reduction in psychological distress at 3-month (Williams, Kolar, Reger, & Pearson, 2001), 6-month (Carlson et al., 2001), 3-year (Miller et al., 1995), and 4-year (Kabat-Zinn, Lipworth, Burney, & Sellers, 1987) follow-up time points.

One major symptom present in many chronic pain conditions is inflammation. It has been found that psychological stress is a major contributor to many chronic inflammatory conditions. A recent study compared MBSR to an active control intervention, a Health Enhancement Program focusing on physical activity, nutrition, and music therapy to reduce psychological stress and experimentally-induced inflammation. The Trier Social Stress Test was used to induce psychological stress and inflammation was produced using topical application of capsaicin cream. Results showed that those randomized to MBSR and control group had similar post-training stress-evoked cortisol responses and reductions in psychological distress and physical symptoms, however, the MBSR group had significantly decreased post-stress inflammatory responses, despite equivalent levels of stress hormones. These findings suggest that MBSR may be helpful in reducing inflammation in chronic conditions (Rosenkranz et al., 2013).

In addition to chronic pain, MBSR has also shown to be effective in treating cancer patients in a randomized, wait-list controlled trial of a heterogeneous group of cancer patients (Specia, Carlson, Goodey, & Angen, 2000). After MBSR, subjects in the treatment group had significantly reduced depression, anxiety, anger as well as fewer cardiopulmonary and gastrointestinal symptoms. This study is particularly important because breast cancer is the most common type of cancer among American women and elicits greater distress than any other diagnosis regardless of prognosis. Cancer patients

have also shown greater increases in spirituality and reductions in stress, depression, and anger in an MBSR group than in a creative arts intervention (Garland, Carlson, Cook, Lansdell, & Speca, 2007).

There has become an increasing interest in studying mindfulness within the neurosciences. Electroencephalographic (EEG) studies have revealed a significant increase in alpha and theta activity during meditation (Davidson et al., 2003). Within neuroimaging, studies suggest that mindfulness could induce ‘state’ changes in the brain including activations of the anterior cingulate cortex (ACC) and the dorsal medial prefrontal cortex (Holzel et al., 2008). Activation in regions of the default network suggests that meditation can regulate resting state levels of mindfulness. This default network has been linked to automatic cognitive activity that is specifically addressed by many meditative practices. Using fMRI, researchers found that behavioral performance did not differ between groups, but that reduced duration of the neural response was related to reduced activity in conceptual processing regions of the default network, suggesting that meditation training may foster the ability to control and regulate automatic thinking (Pagnoni, Cekic, & Guo, 2008). In addition to such state changes, fMRI studies have shown changes in ‘trait’ mindfulness including changes in interoception and attention in areas such as the prefrontal cortex and right anterior insula (Lazar et al., 2005) and the right hippocampus (Holzel et al., 2008), suggesting that specific mindfulness training can improve cerebral areas related to attention and awareness of bodily sensations.

One possible mechanism involved in the improvement of chronic symptoms is the ability for mindfulness techniques to increase quality of life in both healthy (Monti et al.,

2005) and patient populations (Brown & Ryan, 2003; Carlson, Speca, Patel, & Goodey, 2003). For example, studies have shown that chronic pain patients experience a decrease in activity avoidance post-MBSR intervention, helping to improve overall functioning (Kabat-Zinn, Lipworth, & Burney, 1985; Kabat-Zinn et al., 1987). Other studies suggest social functioning as a possible mechanism by which interventions target mental and physical health problems. In other words, the intervention leads to increased involvement in social activities, which in turn leads to a reduction in pain symptoms (Roth & Robbins, 2004).

Rationale for Research

There continues to be a need to study the effects of MBSR as compared to an active control as some findings have been equivocal. A meta-analysis reviewed 15 studies including anxiety and depression outcomes and found that, when active controls were used, the effect on depression and anxiety did not reach significance (Toneatto & Nguyen 2007). Some variables that were infrequently assessed were adherence to the program and relationship between practicing meditation and changes in depression and anxiety.

While both CBT and mindfulness approaches both encourage becoming aware of thoughts and feelings, CBT encourages judging the extent to which thoughts are rational, realistic, or logical (Ellis, 1976; Ellis, 2001; Beck, 1975; Beck, 1993). In contrast, MBSR encourages the acceptance of all thoughts and feelings without judgment (Kabat-Zinn, 1990; Kabat-Zinn, 1994). While the goal of CBT is to replace thoughts that are irrational, unrealistic, or illogical, the goal of MBSR is simply to non-judgmentally observe thoughts and feelings come and go.

In addition to providing additional support for MBSR as an equally effective mind-body treatment, there is a need to better understand the underlying mechanisms of mindfulness and how they improve physical and mental health functioning. A deeper understanding of such mechanisms could lead to a tailoring of interventions to highlight certain techniques based on condition or population. For example, it has been noted that interventions that focus on acceptance, flexibility, and exposure may be of particular benefit to the primary care due to the prevalence of chronic conditions in this population (Shapiro et al., 2006). An attitude of acceptance is a core element of the practice of mindfulness. Kabat-Zinn describes this attitude as an “affectionate, compassionate quality . . . a sense of openhearted, friendly presence and interest” (2003). The goal is for the person to be able practice kindness, non-striving and openness even when they are experiencing something aversive. Flexibility may also be helpful in primary care by facilitating more adaptive responding in contrast to more rigid, reflexive patterns of reactivity. For example, if an individual is experiencing chronic pain, they can bring flexibility to the situation by re-perceiving the pain in its bigger context of daily functioning and quality of life. Exposure is yet another technique that has been found to be effective in reducing anxiety (Barlow & Craske, 2000). Emerging from the theory of exposure therapy, the concept of exposure can be applied to the practice of mindfulness. When an individual is suffering from negative physical and emotional states, it is common to avoid one’s emotions, thoughts, or body sensations. In an anxious person, this could mean exposure to symptoms of anxiety in the absence of catastrophic consequences, leading to desensitization.

This study may be helpful in understanding how MBSR can help improve the

health care system at large. Due to the cost-effective nature of this group intervention, it may be particularly helpful in reducing healthcare costs. One study has examined the effect of MBSR on reducing healthcare utilization in an inner-city population (Roth & Stanley, 2002). Healthcare utilization was determined through medical chart review of 47 subjects. These showed a significant decrease in the number of chronic care visits during the year before entering an MBSR group compared to the year following. Results indicate that MBSR may help contain healthcare costs by decreasing the number of visits to inner-city primary care providers. The small sample, however, limits the implications of this study and suggests further investigation.

Perhaps the most significant justification for this research is the need for information on the efficacy of MBSR within minority populations. Currently, a majority of MBSR studies have focused on NLW, female, middle to upper class subjects (Salmon et al., 2004). Therefore, there is a large group of the population that has not had been exposed to MBSR and other acceptance-based interventions. The current study focuses specifically on the Latino population, whom are currently the fastest growing population in the country (U.S. Census Bureau, 2010) and for whom physical and mental health disparities continue to persist.

In terms of physical health, Latinos exhibit higher prevalence and mortality rates for diabetes, liver disease, and AIDS (CDC, 2009). It is also the case that mental health and other indicators of personal and social distress are more widespread among minorities (Baum, Garofalo, & Yali, 1999). Chronic stress and discrimination have been shown to contribute to poorer health outcomes, illustrating again the strong relationship between mental and physical health (Baum et al., 1999; Williams, 1999).

In addition to health factors, socioeconomic status (SES) may interact with ethnic factors to exacerbate health disparities between groups (Williams, 1999). Research shows that Latinos are more likely to be of lower SES than NLWs (Ashing-Giwa et al., 2006) but that ethnicity is still related to poorer health outcomes even when controlling for income (Simon et al., 2003). These findings suggest that regardless of SES, Latinos are at a greater risk for health problems. In addition to SES, Latinos are found to have less access to adequate medical care, fewer resources, less preventative care, and the lowest rate of medical insurance of all racial and ethnic groups (Vega, Rodriguez, & Gruskin, 2009).

Similar disparities remain present in the mental health. Ethnic minority groups tend to underutilize mental health services, obtain treatment only when these issues become severe, and end therapy prematurely (Flaskerud & Nyamathi, 2000). One possible explanation is that the majority of mental health interventions are designed and studied within NLW subjects and disregard potentially relevant factors that affect treatment efficacy for Latinos. There are cultural elements such as SES, home environment, spirituality, and the impact of systemic and interpersonal discrimination that may also influence treatment outcome (Smith, 2004). Therefore, it is important to begin to study the effects of interventions like MBSR in minority populations.

Preliminary findings suggest that there is no difference between Latino and NLW subjects in the efficacy of an MBSR intervention (Roth & Robbins, 2004; Roth & Creaser, 1997). In addition, when MBSR was conducted with predominately Latino subjects, retention rates averaged at 66% (Roth & Robbins, 2004) higher than the 60% rates in two other studies in bilingual inner-city settings (Kabat-Zinn, 1992; Roth &

Creaser, 1997). Even though these results show improvement, they are still markedly different than the average retention rates for NLW subjects, which range between 80-90% (Kabat-Zinn et al., 1985; Speca, Carlson, Goodey, & Angen , 2000; Reibel et al., 2001).

Hypothesis/ Study Aims

The goal of this study was to examine the effects of MBSR on anxiety and depression of primary care patients immediately following a mind-body intervention. Individuals participated in either an eight-week MBSR course or a CBSM course of equal length. Changes in anxiety, depression and mindfulness were the dependent variables. Control variables included gender, education, and income.

Aim 1: To determine whether MBSR is as effective in decreasing anxiety and depression and increasing mindfulness as CBSM.

Hypothesis 1a: MBSR and CBSM will both result in decreased anxiety and depression when controlling for demographic variables.

Hypothesis 1b: MBSR will show an equal or greater decrease in anxiety and depression than CBSM.

Hypothesis 1c: MBSR will show a greater increase in mindfulness than CBSM.

Aim 2: To identify factors that are correlate with changes in anxiety and depression.

Hypothesis 2: Increases in mindfulness will be correlated with reductions in anxiety and depression.

Aim 3: To examine whether results differ when accounting for racial and ethnic factors.

Hypothesis 3: There will be a higher dropout rate among Latino subjects than NLWs.

Chapter 2

Method

Participants

The subjects were recruited from the Albuquerque, New Mexico, metropolitan area through university intranet, primary care referrals, and local newspaper ads. They self-selected into MBSR or CBSM at First Choice Community Healthcare (FCCH), a federally-qualified health center located in the South Valley of Albuquerque, New Mexico. The MBSR course was advertised as a “stress reduction class” that used meditation and gentle yoga to help people deal with stress. The CBSM course was advertised as a “stress management class” teaching strategies to help identify stressful situations and respond to them in a more relaxed, stress-free way. The inclusion criterion was the willingness to commit to the course and the research study. The exclusion criteria was severe acute mood disorder, psychosis, and substance abuse.

Thirty-five subjects began the interventions (MBSR = 35 and CBSM = 14) and 26 subjects completed them (MBSR = 29 and CBSM = 11). The two groups did not differ in age, gender, income, and education. It is important to note that the subjects in this study were heterogeneous in terms of physical and mental health needs. Although some subjects may have been receiving mental health services through FCCH, this was not a requirement for eligibility. Differences in group size was due to both recruitment and retention differences. The courses were free to all research subjects.

Procedures

MBSR course. The intervention was a modified MBSR course taught by two professionally trained MBSR instructors. The course closely paralleled the MBSR curriculum developed at the University of Massachusetts Medical Center (Kabat-Zinn, 1990) and included a 6-hour 1-day retreat during the 6th week of the course. Everyone in the course always met as one large group, with both instructors present at all times. The weekly sessions were 3 hours long and aimed at increasing mindfulness awareness and attention through the use of breathing, body scans, meditation, gentle hatha yoga, and group discussion. The only significant modification to the standard MBSR course was additional exercises (about 10 minutes long, each week) involving the mindful eating.

CBSM course. The course was taught by two professionally trained and supervised PhD clinical psychology graduate students. As with the MBSR course, everyone in the course always met as one large group and both instructors were present at all times. There was no full-day retreat and the weekly sessions were 3 hours long and focused on cognitive-behavioral techniques such as cognitive restructuring skills and behavioral relaxation techniques.

Measures

A questionnaire was administered within the week before the start of the course and within one week of the end of the course. The questionnaire assessed for demographics, anxiety, depression, and mindfulness. All measures listed below were included both the pre- and post questionnaires.

Demographic and background variables: Demographic and background variables

collected include age, gender, years of education, employment status, and ethnic/racial background.

Anxiety & Depression: was assessed using the *Hospital Anxiety and Depression Scale* (HADS; Zigmond & Snaith, 1983). This includes 14 items and each question is answered on four-point scale (e.g., 1 = not at all to 4 = very often). Items are split into two subscales of seven items each. The anxiety subscale includes items such as, “I feel tense or wound up”. The depression subscale includes items such as, “I still enjoy the things I used to enjoy”. Internal consistency has been tested, high correlations between items were reported and no weak items were identified (Moorey et al. 1991).

Mindfulness: was assessed using the *Five Factor Mindfulness Questionnaire* (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). This includes 39 items and each item is answered on a five point scale from 1 = never or very rarely true to 5 = very often or always true. The measure produces both a total composite score as well as five subscales: observe (e.g. “When I’m walking, I deliberately notice the sensations of my body moving”), describe (e.g. “I’m good at finding words to describe my feelings”), act with awareness (e.g. “When I do things, my mind wanders off and I’m easily distracted), non-judgment (e.g. “I criticize myself for having irrational or inappropriate emotions”), and non-reactivity(e.g. “I perceive my feelings and emotions without having to react to them”). Both total scores and subscales were collected.

Analysis Techniques

The study hypotheses were tested using SPSS Statistics Version 22. The data was examined for outliers as well as homogeneity of variance. In order to determine whether

there were any significant differences in groups or ethnicities on demographic variables, t-tests were conducted to look at differences in gender, income, and education. To examine whether MBSR and CBSM both resulted in improved mental health, a paired t-test was used to observe pre-post differences in anxiety, depression, and mindfulness measures (Hypothesis 1a). An analysis of covariance (ANCOVA) was used to examine group differences while controlling for gender to determine whether subjects in the MBSR group showed different levels of improvement in anxiety and depression (Hypothesis 1b) and a greater level of mindfulness (Hypothesis 1c) than CBSM. Gender was examined as a covariate in the ANCOVA analysis because it was a dichotomous variable that could be treated as a factor.

To examine whether increases in mindfulness were correlated with reductions in anxiety and depression (Hypothesis 2), a correlational analyses was conducted by looking at difference scores. Correlations were also conducted between changes in mindfulness subscales and total mindfulness, anxiety, and depression. To investigate whether there was a higher dropout rate among Latino subjects than among NLWs (Hypothesis 3), a chi square analysis was completed.

Chapter 3

Results

Table 1 displays the descriptive statistics for age, gender, income, and education for all subjects as well as by group and ethnicity. There were no significant differences between groups or ethnicity in age, gender, education, or income. The mean age of subjects 48.37 years (SD = 11.27) and subjects were 68.6% female. The majority of the subjects did not graduate from college (85.7%), were Latino (51.4%), and of low

socioeconomic status (62.9% earned < 25,000/year).

Table 1. Descriptive Statistics for MBSR and CBSM Groups

Statistics	All	MBSR	CBSM	t	P	Latino	NLW	t	P
N	35	21	14			18	14		
Age				-0.973	.338			-0.967	.341
M	48.37	48.86	50.64			49.39	45.43		
SD	11.27	11.10	11.55			10.82	12.33		
Gender				1.179	.247			-0.136	.893
M	11	5	6			6	5		
F	24	16	8			12	9		
% Female	68.6%	76.2%	57.2%			66.7%	64.35%		
Income				1.06	.446			.502	.619
< 25,000	22 62.9%	14 66.7%	8 57.1%			11 61.1%	9 64.3%		
25,000- 49,999	9 25.7%	4 19%	5 35.8%			6 33.4%	2 14.2%		
50,000- 74,999	4 11.4%	3 14.3%	1 7.1%			1 5.6%	3 21.4%		
< 100,000	-	-	-			-	-		
Education				1.68	.103			1.159	.255
Pre-high school	6 17.1%	3 14%	3 21.4%			3 16.7%	3 21.4%		
High school	12 34.3%	5 23.8%	7 50.1%			9 50%	3 21.4%		
Some college	12 34.3%	9 42.8%	3 21.4%			5 27.8%	6 42.8%		
College grad	1 2.9%	-	1 7.1%			1 5.6%	-		
Grad school	4 11.4%	4 19.1%	-			-	2 14.3%		

Tables 2 & 3 display two ANCOVAs that were conducted to examine group differences in anxiety and depression while controlling for gender. Changes in anxiety scores among MBSR subjects and changes in anxiety among CBSM subjects were not significantly different when controlling for gender ($F = .556, p = .464$). Eta-squared was .027. Power was not adequate at .110. Similarly, for depression scores, there was no significant difference between changes in depression among MBSR subjects and changes in depression among CBSM subjects when controlling for gender ($F = 2.32, p = .143$). Eta-square was .104. Power was .360.

Table 2. ANCOVA for Anxiety by Group and Gender

	Anxiety	Gender	Group	Gender * Group	Error
Mean Square	4.012	.114	.003	.106	.190
F	21.125	.602	.015	.556	
P	.001	.447	.905	.464	
Partial Eta Squared	.514	.029	.001	.027	
Observed Power	.992	.115	.052	.110	

R Squared= .548 (Adjusted R Squared =.435)
df = 1 df for error = 20

Table 3. ANCOVA for Depression by Group and Gender

	Depression	Gender	Group	Gender * Group	Error
Mean Square	2.65	.002	.351	.611	.263
F	10.1	.006	1.336	2.322	
P	.005	.938	.261	.143	
Partial Eta Squared	.335	.001	.063	.104	
Observed Power	.855	.051	.196	.306	

R squared =.430 (Adjusted R Squared =.288)
df=1 df for error=20

Tables 4 and 5 describe pre- and post- HADs scores above the clinical cut-off of 8 on a scale from 0-21 (Zigmond & Snaith, 1983). While the results are descriptive in nature, they display large changes in clinically meaningful rates of anxiety and depression. Over all, pre-post treatment scores showed that rates of anxiety dropped from 74% to 42.3% and from 60% to 19% in depression. For subjects in the MBSR group, clinically significant decreases in anxiety decreased from 71.4% to 33.3% and from 52.4% to 13.3% in depression. For subjects in the CSBM group, rates decreased from 78.6% to 54.5% for anxiety and from 71.4% to 27.3% in depression. For Latino subjects, rates dropped from 83.3% to 61.5% for anxiety and 55.6% to 15.4% in depression. Finally for NLW subjects, rates of anxiety dropped from 78.6% to 30% and from 64.3% to 10% for depression. Chi-square statistics do not show significant differences between groups or between ethnicities in the number of subjects above the clinical cut-off pre and post treatment. For anxiety between groups, chi-square was 0.21. The P value was 0.64. For anxiety between ethnicity, chi-square statistic 1.74. The P value was 0.18. For

depression between groups, chi-square was 0.67. The P value was 0.41. For depression between ethnicity, the chi-square was 0.67. The P value is 0.41.

Table 4. Descriptive Statistics for HADS Scores for Anxiety by Groups & Ethnicity

% Above Clinical cut-off	All(35)	MBSR(21)	CBSM(14)	Latino(18)	NLW(14)
Pre-Anxiety	74%(26)	71.4%(15)	78.6%(11)	83.3%(15)	78.6%(11)
Post-Anxiety	42.3%(14)	33.3%(7)	54.5%(7)	61.5%(11)	30%(3)

Note: Actual number of subjects in parentheses

Chi square for group: 0.21 p = 0.64

Chi square for ethnicity: 1.74 p = 0.18

Table 5. Descriptive Statistics for HADS Scores for Depression by Groups & Ethnicity

% Above Clinical cut-off	All	MBSR	CBSM	Latino	NLW
Pre-Depression	60%(21)	52.4%(11)	71.4%(10)	55.6%(10)	64.3%(9)
Post-Depression	19%(7)	13.3%(2)	27.3%(4)	15.4%(3)	10%(1)

Note: Actual number of subjects in parentheses

Chi square for group 0.67 p= 0.41

Chi square for ethnicity = 0.67 p=0.41

Tables 6-8 display paired t-tests were conducted comparing pre- and post-intervention scores on anxiety, depression and mindfulness over all subjects, within each group, within each ethnicity, and within group and ethnicity. Over all subjects, there were significant reductions in anxiety ($t = 4.47$; $p = .001$), depression ($t = 4.06$; $p = .001$), and significant increases in mindfulness ($t = -3.07$; $p = .005$). For subjects in the MBSR group, there were also significant reductions in anxiety ($t = 3.06$; $p = .005$) and depression ($t = 3.15$; $p = .007$), and significant increases in mindfulness ($t = -3.07$; $p = .008$). For subjects in the CBSM group, there were significant reductions in anxiety ($t = 3.20$; $p = .009$) and depression ($t = 2.46$; $p = .034$), but there was not a significant change

in mindfulness.

Latino subjects showed significant reductions in depression ($t = 3.24$; $p = .007$), but no changes in anxiety or mindfulness. NLW subjects showed significant reductions in anxiety ($t = 3.41$; $p = .008$) and depression ($t = 2.81$; $p = .020$), but no changes in mindfulness. When examining differences within group and ethnicity, the only significant differences were found within the NLW subjects in the MBSR group, displaying reductions in both anxiety ($t = 3.01$; $p = .030$) and depression ($t = 2.57$; $p = .05$).

Next, the effect sizes for the pre–post changes were examined. Tables 6-8 display the Cohen's d scores for changes in anxiety, depression and mindfulness for all subjects, within groups, and within ethnicity. Over all, there was a change in the desired direction for all three variables. Using Cohen's guidelines for interpreting effect sizes, subjects showed large reductions in anxiety ($d = .67$), depression ($d = .70$) and increases in mindfulness ($d = -.50$). Subjects in the MBSR group showed large reductions in anxiety ($d = .64$), depression ($d = .71$), and increases in mindfulness ($d = -.50$). Subjects in the CBSM group, displayed large reductions in anxiety ($d = .71$) and depression ($d = .86$) and a medium increase in mindfulness ($d = .48$). Across all variables, the mean effect size for subjects in MBSR group was .62 and .68 for subjects in the CBSM group.

Examining effect sizes between ethnicities revealed that Latino subjects had large reductions on depression ($d = .78$), medium reductions in anxiety ($d = .47$) and small increases on mindfulness ($d = -0.23$) after treatment. NLWs showed large reductions in anxiety ($d = 1.08$), depression ($d = 1.14$) and mindfulness ($d = -0.74$) after treatment. For Latino subjects in the MBSR group, there were large reductions in depression ($d = .94$),

small reductions in anxiety ($d = .36$) and increases in mindfulness ($d = -.18$). For NLW subjects in MBSR, there were large reductions in anxiety ($d = 1.41$), anxiety ($d = 2.04$), and mindfulness ($d = -.83$). For Latino subjects in the CBSM group, there were large reductions in anxiety ($d = .53$), depression ($d = .71$), and large increases in mindfulness ($d = -.93$) For NLW subjects in the CBSM group, there were large reductions on anxiety ($d = 2.16$), depression ($d = 2.12$), and small increases in mindfulness ($d = -.30$).

Table 6. Pre Post Scores for Anxiety by Group and Ethnicity

Variable	All	MBSR	CBSM	Latino	NLW	MBSR & Latino	MBSR & NLW	CBSM & Latino	CBSM & NLW
Pre-Anxiety	2.50	2.42	2.61	2.70	2.45	2.71	2.45	2.69	2.46
Post-Anxiety	2.12	2.06	2.19	2.42	1.91	2.52	1.90	2.35	1.93
Cohen's d	.67	.64	.71	.47	1.08	.36	1.41	0.53	2.16
T	4.47	3.06	3.20	2.42	3.41	.865	3.01	3.23	1.64
P	.001	.008	.009	0.33	.008	.43	.030	0.18	.200

Table 7. Pre and Post Scores on Depression by Group and Ethnicity

Variable	All	MBSR	CBSM	Latino	NLW	MBSR & Latino	MBSR & NLW	CBSM & Latino	CBSM & NLW
Pre-Depression	2.32	2.16	2.55	2.27	2.44	2.05	2.28	2.47	2.68
Post-Depression	1.88	1.73	2.09	1.84	1.87	1.57	1.70	2.06	2.14
Cohen's d	.70	.71	.86	.78	1.14	.94	2.04	0.71	2.12

t	4.06	3.15	2.46	3.24	2.81	2.33	2.57	2.09	1.29
p	.001	.007	.034	.007	.020	.067	.05	.082	.290

Table 8. Pre and Post Scores on Mindfulness by Group and Ethnicity

Variable	All	MBSR	CBSM	Latino	NL W	MBSR & Latino	MBSR & NLW	CBSM & Latino	CBSM & NLW
Pre-Mindfulness	3.27	3.38	3.10	3.16	3.26	3.11	3.5	2.9	3.2
Post-Mindfulness	3.49	3.6	3.33	3.24	3.57	3.17	3.72	3.35	3.31
Cohen's d	-0.50	-0.50	-0.49	-0.23	-0.74	-0.18	-0.83	-0.93	-0.30
t	-3.07	-3.073	-1.475	-1.32	-2.04	-.736	-2.02	-1.12	-1.025
p	.005	.008	.174	.215	.071	.495	.099	.344	.352

Table 9 displays correlations between anxiety, depression and mindfulness within all subjects, within groups, and within ethnicities. Over all subjects, there was a significant correlation between reductions in anxiety and increases in mindfulness ($r = -.665$) and between reductions in depression and increases in mindfulness ($r = -.408$). For subjects in the MBSR group, there were also significant reductions in anxiety and increases in mindfulness ($r = -.650$). There was not a significant correlation between reductions in depression and increases in mindfulness ($r = -.121$). For subjects in the CBSM group, there was a significant correlation between reductions in anxiety and

increases in mindfulness ($r = -.733$), as well as reductions in depression and increases in mindfulness ($r = -.635$).

For Latino subjects, there was not a significant correlation between reductions in anxiety and increases in mindfulness ($r = -.338$) or between reductions in depression and increases in mindfulness ($r = -.254$). For NLW subjects, however, there was a significant correlation between reductions in anxiety and increases in mindfulness ($r = -.895$) and reductions in depression and increases in mindfulness ($r = -.725$).

Table 9. Correlational Analyses for Anxiety, Depression, and Mindfulness by Group

	Mindfulness				
	All	MBSR	CBSM	Latino	NLW
Anxiety	-.665**	-.650**	-.733**	-.338	-.895**
Depression	-.408*	-.121	-.635*	-.254	-.725**

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

for difference scores

Table 10 displays correlational analyses that were conducted to determine the relationships between anxiety, depression, and mindfulness and mindfulness subscales. Non-reactivity was positively correlated with increases in mindfulness ($r = .408$), but no changes were found in anxiety ($r = -.241$) or depression ($r = -.186$). Observing was positively correlated with reductions in anxiety ($r = -.436$), but not with changes in depression ($r = -.262$) or mindfulness ($r = .295$). Acting with Awareness was positively correlated with reductions in anxiety ($r = -.537$) and increases in mindfulness ($r = .876$), but not with changes in depression ($r = -.311$). Describing was positively correlated with

reductions in anxiety ($r = -.469$) and increases in mindfulness ($r = .610$), but not changes in depression ($r = -.089$). Non-judgment was positively correlated with increases in mindfulness ($r = .683$), but not changes in anxiety ($r = -.297$) or depression ($r = -.319$).

Table 10. Correlation Analyses Among Mindfulness Subscales

	Non- Reactivity	Observe	Act with Awareness	Describe	Non- judgment
Anxiety	-.241	-.436*	-.537**	-.469*	-.297
Depression	-.186	-.262	-.311	-.089	-.319
Mindfulness	.408*	.295	.876**	.610**	.683**

* $p < .05$, ** $p < .01$

Table 11 displays that out of the 21 subjects who enrolled in MBSR, 15 completed and 6 dropped out before the last session. Out of the 14 subjects enrolled in CBSM, 11 completed and 3 dropped out before the last session. A chi-square analysis of attrition showed that there were no significant differences in attrition between MBSR and CBSM groups (chi-square = 0.22; $p = .64$). Out of the 15 Latinos enrolled in groups, 10 completed and 5 dropped out before the last session. Out of the 17 NLWs, 13 completed and 4 dropped out before the last session. Chi-square analysis showed that there were no significant differences between Latinos and NLWs (chi-square = 0.34; $p = 0.54$)

Table 11. Chi-Square Analysis of Attrition

	MBSR	CBSM	Group Total	Latino	NLW	Ethnicity Total
Completers	15	11	26	10	13	23
Attriters	6	3	9	5	4	9
Column Total	21	14	35	15	17	32
Chi-Square			0.22			0.34
p			0.64			0.54

* Differences in size between group and ethnicity total is due to the three subjects who did not fit into the two ethnic groups included in the study.

* p not significant at < 0.05.

Chapter 4

Discussion

Aim 1 was to determine whether MBSR was as effective in decreasing anxiety and depression and increasing mindfulness as CBSM. Hypothesis 1a stated that subjects in MBSR and CBSM groups would both show reductions in anxiety and depression. Hypothesis 1a was supported through an examination of paired t-tests showing changes in the desired direction for anxiety and depression in both of the mind-body interventions.

Hypothesis 1b stated that MBSR would show an equal or greater reduction in anxiety and depression than CBSM. ANCOVA analyses detected no significant differences in depression and anxiety scores between subjects in MBSR and CBSM groups. Power analyses indicate insignificant power to detect a difference between groups for both anxiety and depression. These findings fail to support Hypothesis 1b. Descriptive statistics, however, show large reductions in the number of subjects with levels of anxiety and depression above the clinical cut-off when compared before and

after treatment. These large reductions were found in both MBSR and CBSM groups, illustrating similar effects of the two interventions. Such findings are limited due to the reliance on HADs clinical-cut offs as well as the lack of formal DSM diagnosis. The arbitrary nature of cut-off points such that a subject with a score of 9 would be labeled clinically anxious whereas a subject with a score of 7 would not. Hypothesis 1c stated that MBSR would show a greater increase in mindfulness than CBSM. This was supported by examining effect sizes, which showed that while MBSR exhibited significant changes in all three study variables, CBSM only showed significant reductions in anxiety and depression and did not change significantly in mindfulness.

One interpretation of the lack of difference between groups is that there was not adequate power to detect a difference. Another interpretation is that the two interventions were equally helpful at decreasing stress and anxiety. While MBSR and CBSM have different theoretical underpinnings, it may be the case that they function in a similar way in the primary care setting. For example, social support may be particularly important for this population and both interventions may have served this purpose. While it is not surprising that MBSR was associated with an increase in mindfulness, the focus on acceptance emphasized in MBSR may have facilitated the growth of mindful awareness, while the focus on judging and changing thoughts and feelings in CBSM may have actually prevented change. Another important point to keep in mind is that results on changes in mindfulness are contingent on the scale by which they were measured and as noted in the background section, the construct of mindfulness is still an area of debate within the field.

An examination of ethnic differences on treatment effects may also contribute to a

better understanding of how to best implement MBSR in a primary care setting. An analysis of t-tests showed that NLW subjects had reductions in both anxiety and depression, while Latinos only showed reductions in depression. When examining effect sizes, NLW subjects showed large effects on all variables, while results in Latinos were more diverse, displaying a large effect on depression, a medium effect of anxiety and a small effect on mindfulness. A similar trend was found between NLW subjects and Latinos in the MBSR group, but not in CBSM group. These findings suggest the presence of an ethnic difference in outcome that may be more pronounced in the MBSR group. What is it about MBSR that might accentuate this ethnic difference? One explanation is that the technique itself is less culturally relevant for Latinos than NLWs. When dealing with a variety of environmental hardships, it may be that non-reactivity and acceptance, for example, are less valuable techniques for some cultures than for others. On the other hand, it may be that these techniques could otherwise be helpful but that there are not being taught in an effective way. These findings support the proposal to adapt MBSR treatments to better serve the Latino population.

Aim 2 was to identify factors that correlate with changes in anxiety and depression. Hypothesis 2 stated that increases in mindfulness would be correlated with reductions in anxiety and depression. In all subjects, there was a significant correlation between reductions in anxiety and depression and increases in mindfulness. Similar results were found for subjects in the CBSM group. In MBSR, however, there was only a correlation between reductions in anxiety and increases in mindfulness, but not between reductions in depression and increases in mindfulness. For Latino subjects, no correlations were detected. For NLW subjects, both correlations between reductions in

anxiety and increases in mindfulness and reductions in depression and increases in mindfulness were found. These findings partially support Hypothesis 2 and illustrate that increases in mindfulness are correlated with reductions in anxiety and depression in all subjects, but that these relationships change when subjects are examined within groups and ethnicities. Group differences suggest that increases in mindfulness are more strongly related to reductions in depression within CBSM than MBSR. This could indicate an emphasis on reducing depression in CBSM, however, because the CBSM group did not have significant changes in mindfulness, these findings are limited. Ethnic differences find that correlations are stronger in NLW, suggesting a difference in intervention efficacy between the two ethnic groups.

Correlations between study variables and mindfulness subscales show that non-reactivity, acting with awareness, describing, and non-judgment were all correlated with increases in mindfulness and acting with awareness and describing were also found to be correlated with reductions in anxiety. No subscales were correlated with reductions in depression. Why might some subscales be more highly correlated with mindfulness and anxiety than others? This is an important question for intervention development, as it may be beneficial to emphasize these subscales more specifically in the future. It may be the case that an increase in skills such as acting with awareness and describing function as coping skills for primary care patients dealing with high rates of anxiety and depression.

Aim 3 was to examine whether results differ when accounting for racial and ethnic factors. Hypothesis 3 stated that there would be a higher dropout rate among Latino subjects than NLWs. A chi-square analysis of attrition showed that there were no significant differences in attrition between groups or ethnicities. The inability to detect a

significant ethnic difference in drop-out may be due to small sample size or may be a difference in the study environment. One possible explanation is that because this study had a majority of Latino subjects there was a greater social support in this setting, as is rarely the case in intervention studies.

Clinical Implications

The most important implication for this study is that mind-body interventions such as MBSR and CBSM both improve anxiety and depression, suggesting that such interventions can be helpful in a Latino-majority, low-income primary care population with high rates of anxiety and depression. Large reductions in the number of subjects with levels of anxiety and depression above the clinical cut-off further the support for such effects. These results are of particular importance because the subjects were not recruited from a mental health setting and therefore, may or may not have been receiving any care for these symptoms. Improvements in MBSR with regard to these outcomes may be related to the cultivation of a more accepting, non-reactive attitude. The lack of significant group differences suggests that future research should continue to examine the differences between the two interventions with a larger sample size. It may also be the case that the two interventions are equally effective in reducing anxiety and depression, in which case future research should focus on determining what common factors may contribute to these shared effects.

There are also important implications for ethnic differences in treatment outcome. The presence of more diverse effect sizes (large for depression, medium for anxiety, small for mindfulness) in the Latino subjects than in NLW subjects (large for all three variables), as well as stronger correlations in NLWs on increases in mindfulness with

reductions in anxiety and depression than in Latino subjects illustrate significant differential effects among ethnic groups. Whether it is the content of the material or the usefulness of the skills, there is a need for research examining such differences in a larger sample. Differences between ethnic groups may be accentuated when examined within MBSR, suggesting that the intervention may have culturally contingent elements. This should be examined in further research so as to improve the efficacy of the MBSR intervention in the Latino population. Thus, culturally adaptive MBSR interventions may be an important clinical development.

Finally, this study has implications for better understanding the underlying mechanisms involved in the construct of mindfulness. Correlations between study variables and mindfulness subscales showed that non-reactivity, acting with awareness, describing, and non-judgment were all correlated with increases in mindfulness and that acting with awareness and describing were also found to be correlated with reductions in anxiety. It may be that targeting these skills more specifically in treatment may increase the ability for MBSR to reduce anxiety and increase mindfulness.

Future Research

Future research should include randomized, controlled trials comparing cognitive-behavioral and mindfulness-based interventions to continue to explore their effects in a larger sample size. This type of research can help to further understand the extent to which accepting versus judgmental approaches to one's experiences influence the development of mindfulness as well as reducing rates of anxiety and depression. Due to the similar effect sizes between groups on the reduction of anxiety and depression, future research may find the two interventions may be functioning in similar ways and are

equally effective. Research should also continue to look at these differences as they relate to ethnicity as well as other demographic variables, such as education and income. With an adequate sample size, it may be that such differences such as drop-out rate on the effectiveness of MBSR in the Latino could be more clearly understood. This type of research could help advance research on ethnic-related differences on MBSR retention rates as proposed by Roth & Robbins (2004).

It would also be of use for research to shift its focus of study from structural group differences toward functional mechanisms of change. Such research could use knowledge of the increased efficacy of certain mindfulness skills such as acting with awareness or describing and adapt interventions to improve outcome. This type of research would help to target the most essential elements of mindfulness and make the treatment more efficient. Due to changes in health care coverage, a more efficient treatment may become more crucial to providing quality care.

Limitations

There are a number of limitations in this study. The largest limitations include the small sample of 35 subjects as well as the lack of a randomized, controlled design. The small sample size limited the amount of power necessary to detect statistical significance while the lack of randomization increases the risk of a self-selection bias. These two limitations make it difficult to draw strong conclusions from any of the reported results. On the other hand, strong effect sizes were found within groups and ethnicities despite such limitations. The lack of information about other major health conditions that may have impacted study findings could be seen as another limitation. Future studies would benefit from gaining access to medical history to account for such underlying differences,

however, a more heterogeneous group of primary care subjects allows for greater generalizability.

Summary

The most important finding of this study was that both MBSR and CBSM groups displayed significant reductions in anxiety and depression scores. In addition, an examination of HADS scores showed drastic reductions in the percentage of subjects with anxiety and depression diagnoses above the clinical cut-off after treatment. Furthermore, while MBSR and CBSM were both effective in reducing anxiety and depression, MBSR was more effective in increasing mindfulness. The increased effectiveness of MBSR with regard to these outcomes could be related to the cultivation of a more accepting, observant attitude toward one's inner experience. Difference in effects between Latinos and NLWs suggest that mind-body interventions, and particularly MBSR, would benefit from adapting interventions to better serve the Latino population. Mindfulness subscales had differing relationships with changes in outcomes, suggesting that specific skills such as acting with awareness and describing may be particularly helpful in decreasing anxiety. Future research should include randomized, controlled trials comparing cognitive-behavioral and mindfulness-based interventions to better understand how the two groups function in their ability to decrease anxiety and depression. Research also needs to emphasize more directly the differences in ethnic factors as well as the role of specific mindfulness subscales on treatment outcome.

Appendix A

Demographics Questionnaire

1. Name _____ 2. Date _____
- 2.a. Sex: Male _____ Female _____
- 2.b. Age _____ 3. Date of Birth _____ 4. Height _____
5. Weight _____
6. Years of Education (check one)
- | | |
|------------------------------|---|
| _____ 0-4 Years | _____ Post high school,
business or trade school |
| _____ 5-8 Years | _____ 1-3 years of college |
| _____ High school incomplete | _____ 4 years of college |
| _____ High school completed | _____ Post graduate school |
7. Current marital/relationship status (check one)
- | | | |
|------------------------------------|-----------------|---------------|
| _____ Never married | _____ Divorced | _____ Widowed |
| _____ Married | _____ Separated | |
| _____ Living with romantic partner | | |
8. Are you presently employed or volunteering? (check one)
- | | | |
|----------------------|----------------------|----------|
| _____ Yes, Full-time | _____ Yes, Part-time | _____ No |
|----------------------|----------------------|----------|
- If employed or volunteering, briefly describe type of work _____
9. What ethnic or racial groups do you identify with (check all that apply)?
- | | |
|------------------------------|---|
| _____ White, not Hispanic | _____ Asian or Pacific Islander |
| _____ Black, not Hispanic | _____ American Indian or Alaskan Native |
| _____ Hispanic | _____ Mixed (Specify:
_____) |
| _____ Other (Specify: _____) | |
10. What was your family income last year? This should include income from work plus other sources such as interest, social security, and so forth. (check one)

<input type="checkbox"/> Under \$3,000	<input type="checkbox"/> \$15,000-\$16,999	<input type="checkbox"/> \$50,000-\$59,999
<input type="checkbox"/> \$3,000-\$4,999	<input type="checkbox"/> \$17,000-\$18,999	<input type="checkbox"/> \$60,000-\$69,999
<input type="checkbox"/> \$5,000-\$6,999	<input type="checkbox"/> \$19,000-\$20,999	<input type="checkbox"/> \$70,000-\$99,999
<input type="checkbox"/> \$7,000-\$8,999	<input type="checkbox"/> \$21,000-\$24,999	<input type="checkbox"/> \$100,000-
<input type="checkbox"/> \$149,999		
<input type="checkbox"/> over	<input type="checkbox"/> \$25,000-\$29,999	<input type="checkbox"/> \$150,000 and
<input type="checkbox"/> \$9,000-\$10,999	<input type="checkbox"/> \$30,000-\$39,999	
<input type="checkbox"/> \$11,000-\$12,999	<input type="checkbox"/> \$40,000-\$49,999	
<input type="checkbox"/> \$13,000-\$14,999		

11. How often do you attend religious services? (check one)

<input type="checkbox"/> Never	<input type="checkbox"/> Every month or so	<input type="checkbox"/> Once a week
<input type="checkbox"/> Once or twice a year	<input type="checkbox"/> Once or twice a month	<input type="checkbox"/> More than once a week

12. What is your religious preference?

<input type="checkbox"/> Roman Catholic	<input type="checkbox"/> Jewish	<input type="checkbox"/> None
<input type="checkbox"/> Christian, non-Roman Catholic	If so, what denomination? _____	
<input type="checkbox"/> Other		

(Specify: _____)

13. To what extent do you consider yourself a religious person?

Not at all. 1 2 3 4 5 A great deal

14. To what extent do you consider yourself a spiritual person?

Not at all. 1 2 3 4 5 A great deal

Appendix B

Anxiety & Depression Measure

Think about **the past 2 weeks** and place a check in one blank for each statement.

1. I felt tense or wound up.

- Most of the time
- A lot of the time
- From time to time, occasionally
- Not at all

8. I felt as if I was slowed down.

- Nearly all the time
- Very often
- Sometimes
- Not at all

2. I enjoyed the things I used to enjoy.
like

- Definitely as much
- Not quite as much
- Only a little
- Hardly at all

9. I got a sort of frightened feeling
butterflies in my stomach.

- Not at all
- Occasionally
- Quite often
- Very often

3. I got a sort of frightened feeling as if
something awful was about to happen.
appearance.

- Very definitely and quite badly
- Yes, but not too badly
should
- A little, but it didn't worry me
- Not at all

10. I have lost interest in my

- Definitely
- I don't take so much care as I
- I may not take quite as much care
- I take just as much care as ever

4. I could laugh and see the funny side of things.

- As much as I always could
- Not quite so much now
- Definitely not so much now

11. I felt restless as if I had to
be on the move.

- Very much indeed
- Quite a lot
- Not very much

___ Not at all

___ Not at all

5. Worrying thoughts went through my mind.

12. I looked forward with enjoyment to things.

___ A great deal of the time

___ As much as I ever did

___ A lot of the time

___ Rather less than I used to

___ From time to time but not too often.

___ Definitely less than I used

to

___ Only occasionally

___ Hardly at all

6. I felt cheerful.

13. I got sudden feelings of panic.

___ Not at all

___ Very much indeed

___ Not often

___ Quite a lot

___ Sometimes

___ Not very much

___ Most of the time

___ Not at all

7. I could sit at ease and feel relaxed.
program.

14. I could enjoy a book/radio/TV

___ Definitely

___ Often

___ Usually

___ Sometimes

___ Not often

___ Not often

___ Not at all

___ Very seldom

Appendix C

Mindfulness Measure

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you. Circle one number.

1 = never or very often or rarely true
 2 = rarely true
 3 = sometimes true
 4 = often true
 5 = very always true

- | | | | | | |
|--|---|---|---|---|---|
| 1. When I'm walking, I deliberately notice the sensations of my body moving..... | 1 | 2 | 3 | 4 | 5 |
| 2. I'm good at finding words to describe my feelings..... | 1 | 2 | 3 | 4 | 5 |
| 3. I criticize myself for having irrational or inappropriate emotions..... | 1 | 2 | 3 | 4 | 5 |
| 4. I perceive my feelings and emotions without having to react to them..... | 1 | 2 | 3 | 4 | 5 |
| 5. When I do things, my mind wanders off and I'm easily distracted..... | 1 | 2 | 3 | 4 | 5 |
| 6. When I take a shower or bath, I stay alert to the sensations of water on my body..... | 1 | 2 | 3 | 4 | 5 |
| 7. I can easily put my beliefs, opinions, and expectations into words..... | 1 | 2 | 3 | 4 | 5 |
| 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted..... | 1 | 2 | 3 | 4 | 5 |
| 9. I watch my feelings without getting lost in the..... | 1 | 2 | 3 | 4 | 5 |
| 10. I tell myself I shouldn't be feeling the way I'm feeling..... | 1 | 2 | 3 | 4 | 5 |
| 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions..... | 1 | 2 | 3 | 4 | 5 |
| 12. It's hard for me to find the words to describe | | | | | |

what I'm thinking.....	1	2	3	4	5
13. I am easily distracted.....	1	2	3	4	5
14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.....	1	2	3	4	5
15. I pay attention to sensations, such as the wind in my hair or sun on my face.....	1	2	3	4	5
16. I have trouble thinking of the right words to express how I feel about things.....	1	2	3	4	5
17. I make judgments about whether my thoughts are good or bad.....	1	2	3	4	5
18. I find it difficult to stay focused on what's happening in the present.....	1	2	3	4	5
19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.....	1	2	3	4	5
20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.....	1	2	3	4	5
21. In difficult situations, I can pause without immediately reacting.....	1	2	3	4	5
22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right word.	1	2	3	4	5
23. It seems I am "running on automatic" without much awareness of what I'm doing.....	1	2	3	4	5
24. When I have distressing thoughts or images, I feel calm soon after.....	1	2	3	4	5
25. I tell myself that I shouldn't be thinking the way I'm thinking.....	1	2	3	4	5

26. I notice the smells and aromas of things.....	1	2	3	4	5
27. Even when I'm feeling terribly upset, I can find a way to put it into words.....	1	2	3	4	5
28. I rush through activities without being really attentive to them.....	1	2	3	4	5
29. When I have distressing thoughts or images I am able just to notice them without reacting.....	1	2	3	4	5
30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.....	1	2	3	4	5
31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow	1	2	3	4	5
32. My natural tendency is to put my experiences into words	1	2	3	4	5
33. When I have distressing thoughts or images, I just notice them and let them go.....	1	2	3	4	5
34. I do jobs or tasks automatically without being aware of what I'm doing.....	1	2	3	4	5
35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.....	1	2	3	4	5
36. I pay attention to how my emotions affect my thoughts and behavior.....	1	2	3	4	5
37. I can usually describe how I feel at the moment in considerable detail.....	1	2	3	4	5
38. I find myself doing things without paying attention...	1	2	3	4	5
39. I disapprove of myself when I have irrational ideas.....	1	2	3	4	5

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