

Mindfulness-Based Stress Reduction: An Intervention to Enhance the Effectiveness of Nurses' Coping With Work-Related Stress

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PURPOSE: This critical literature review explored the current state of the science regarding mindfulness-based stress reduction (MBSR) as a potential intervention to improve the ability of nurses to effectively cope with stress.

METHODS: Literature sources include searches from EBSCOhost, Gale PowerSearch, ProQuest, PubMed Medline, Google Scholar, *Online Journal of Issues in Nursing*, and reference lists from relevant articles.

FINDINGS: Empirical evidence regarding utilizing MBSR with nurses and other healthcare professionals suggests several positive benefits including decreased stress, burnout, and anxiety; and increased empathy, focus, and mood.

CONCLUSIONS: Nurse use of MBSR may be a key intervention to help improve nurses' ability to cope with stress and ultimately improve the quality of patient care provided.

Modern nursing is plagued with increasing professional stressors. Nurses both historically and today have had the stress of dealing with caring for dying patients, witnessing patient suffering, and acting as a support system for patients and their families. All of which can be very emotionally draining on the nurse. The modern world of health care and tightening budgets are resulting in additional work-related stressors such as barriers to providing optimal care, increasingly complex needs of patients, short acute care lengths of stays, the need for increased knowledge of ever-changing technology, nursing shortages, poor staffing, long work hours, limited resources, and feelings of lack of control (McCloskey & Taggart, 2010). These mounting work-related stressors put nurses at increased risk for ineffective coping. The purpose of this critical literature review is to explore the current state of the science regarding a specific form of meditation called mindfulness-based stress reduction (MBSR) as a potential intervention to improve nurses' ability to effectively cope with work-related stress and ultimately improve patient care. Based on a critical review of the existing literature, gaps and implications for nursing research and practice will be identified and discussed.

Background of Ineffective Coping

The NANDA-International definition of ineffective coping is "the inability to form a valid appraisal of stressors, inadequate choices of adequate practical responses, and/or inability to use available resources" (Varcariolis, 2011,

p. 195). Numerous studies have investigated the defining characteristics of nurses ineffectively coping with stress. Ineffective coping with stress has been associated with changes in cognitive, behavioral, and emotional functions (Cox, Griffiths, & Rial-Gonzalez, 2000); sleep disturbances, interference with relationships at home, inability to focus, increased utilization of sick time, and burnout (McCloskey & Taggart, 2010). Ineffective coping also puts nurses at risk for depersonalization, which "refers to impersonal feelings toward those receiving care" (Mealer, Burnham, Goode, Rothbaum, & Moss, 2009, p. 1119). Ineffective coping does not only have poor consequences for nurses. Nurses' stress has been associated with nurses' reports of decreased ability to focus on patient needs and patients' reports of decreased satisfaction with care (Beddoe & Murphy, 2004; Vahey, Aiken, Sloane, Clarke, & Vargas, 2004). The reality of ineffective coping among nurses drives the need to identify interventions to help nurses learn to effectively cope with mounting work-related stress to help improve nurses' job satisfaction, decrease rates of burnout, and improve the quality of patient care.

Eliminating work-related stress for nurses is not a realistic goal. However, implementing interventions that are focused on helping nurses learn to cope more effectively with stress is realistic. Reviewing both nursing and occupational health research, numerous interventions have been identified that help individuals deal with work-related stress. A few of the interventions identified include exercise programs (Bruning & Frew, 1986; Raingruber & Robinson,

2007), social support groups (Fenlason & Beehr, 1994; Ganster, Fusilier, & Mayes, 1986; Medland, Howard-Ruben, & Whitaker, 2004), journaling (Alford, Malouff, & Osland, 2005; Medland et al., 2004), cognitive-behavioral skills development (Gardner, Rose, Mason, Tyler, & Cushway, 2005), biofeedback-assisted techniques (Cutshall et al., 2011), and meditation (Oman, Hedberg, & Thoresen, 2006; Richards, Oman, Hedberg, Thoresen, & Bowden, 2006). Among these interventions reviewed, one of the most frequently identified, effective interventions used in a variety of professions to help address ineffective coping with stress was meditation. Using meditation to deal with stress is not a new concept. Meditation is one of the oldest methods of stress reduction dating back to before 5,000 BC (Gawler & Bedson, 2010). Additionally, according to the National Institute of Health, "persuasive evidence exists that meditation interventions are associated with better health outcomes" (Davies, 2008, p.33; Oman et al., 2006, p. 714). This ancient stress-reduction practice is a promising intervention to help improve nurses' coping with stress.

Meditation

Meditation is considered a spiritual practice that focuses on regulation of self-thought (Gawler & Bedson, 2010). There are several different means in which people practice meditation; however, they fall under two categories: concentrative and mindfulness (Ott, 2004).

Concentrative meditation is focused on cultivating focused attention through the use of mantras, breathing, or visualization (Ott, 2004; Institute of Noetic Sciences [IONS], 2013). A popular form of concentrative mantra meditation is Transcendental Meditation, which was introduced by Maharishi Mahesh Yogi in the 1950s (Maharishi Foundation, 2013).

The second category of meditation is mindfulness meditation, which is the category MBSR falls under. Mindfulness meditation is "the most popular, widely adapted, and widely researched meditation technique in the West" (IONS, 2013, para. 4). Derived from Buddhism, mindfulness meditation focuses on "conscious discipline of intentional self-regulation," also known as insightful meditation or vipassana (Ott, 2004, p. 24). The practice of mindfulness meditation begins with deliberate, conscious breathing. As each breath occurs, the participant focuses on the gift of the moment (Ott, 2004). Eventually, the participant can learn to progress to mentally escaping the limitations of their physical boundaries. For example, when a nurse is on a break, rather than spending the time replaying the stressful events of the shift, the nurse can use the practice of mindfulness meditation to redirect their mind to a more relaxing place. In addition to the stress-relieving benefits of mindful meditation, the repetitive use of meditation has been found to physically alter portions of the brain that improve focus and attention (Lazar et al., 2005). According to Epstein (2003), mindfulness can lead to valued qualities in healthcare providers, including "attentiveness, interest in

clinical problems, interest in the patient-as-person, clinical judgment, compassion, and presence" (p. 2).

MBSR

MBSR is an 8-week intensive training in mindfulness meditation. The program was created by Kabat-Zinn and colleagues in 1979 at the Stress Reduction Clinic at the University of Massachusetts Medical Center (University of Massachusetts Worcester Campus Center for Mindfulness Website, n.d.). The MBSR training combines mindfulness meditation with yoga in an effort to maintain mental and physical health. Kabat-Zinn's original MBSR course took 8 weeks to complete, consisting of a daylong retreat and two-and-a-half hour-long weekly classes, and participants are given recordings to guide them through practicing the techniques learned on their own 6 days a week (Kabat-Zinn, 1990). The program has been found to be effective in relieving stress and in improving well-being in multiple studies regarding its use with patients with physical illnesses, disease, and psychiatric disorder (Baer, Smith, & Allen, 2004; Brantley, 2005; Carlson & Garland, 2005; Grossman, Niemann, Schmidt, & Walach, 2004; Tacón, Caldera, & Ronaghan, 2004). However, only a few studies have been conducted utilizing the practice with nurses or other healthcare professionals. This article looks specifically at these studies.

Scope and Rationale for the Literature Selected

In an effort to investigate the current state of the science regarding the use of MBSR with nurses, research articles were collected from literature searches, including EBSCOhost, Gale PowerSearch, ProQuest, PubMed Medline, Google Scholar, *Online Journal of Issues in Nursing*, and reference lists from relevant articles. Search terms included MBSR, mindfulness-based meditation, nurse, healthcare professionals, ineffective coping, and stress.

Inclusion Criteria

Only empirical articles that included nurses or student nurses were included in the sample. Studies were still included if other healthcare professionals and healthcare students were in the study sample as long as nurses or student nurses were included. Inclusion criteria also included the use of MBSR and any modified programs derived from MBSR.

Exclusion Criteria

Studies involving meditation interventions were excluded if the meditation techniques were not based on Kabat-Zinn and colleagues' MBSR, for example, the Eight-Point Program (EPP; Easwaran, 1991). Articles that were not empirical or articles that included patients as the focus

were also excluded. Due to the relative paucity of the research regarding MBSR, specifically with nurses or student nurses as the population of interest, no date parameters were applied to the literature search. Based on the inclusion and exclusion criteria, 13 empirical articles were retrieved ($N = 13$).

Sample Characteristics and Demographics

Sample Characteristics

Five of the studies involved students from a variety of health science backgrounds, including medical students, psychology students, and social work students; two studies involved nursing students; four studies included a variety of healthcare professionals in practice (including nurses); one study included nurses and nurse aides working in a non-acute setting; and one study included nurse leaders. With the exception of the study conducted by Rosenzweig, Reibel, Greeson, Brainard, and Hojat (2003) with medical students ($N = 302$), the studies included in this review had very limited sample sizes. Of the six studies that included practicing nurses, the sample sizes ranged from as few as 18 to 84. Of the studies with exclusively nurse participants, the greatest sample size was 33. Small sample sizes can limit statistical power, affect the generalizability of a study's findings, and make it difficult to identify small changes. Additionally, consideration should be paid to the fact that more than half of the studies included students and not practicing professionals. Potentially, the results of MBSR may vary when used to deal with workplace stress rather than school-related stress.

Sample Demographics

The studies were inconsistent in reporting demographic information specific to gender, age, and ethnicity of participants. Based on those studies that did report their demographic information, the majority of the participants were female and Caucasian. The age of participants varied in the studies based on the populations studied. The studies that included students had the majority of the participants in their 20s, whereas the studies that included working healthcare professionals had the majority of the participants in their 40s.

Analysis, Evaluation, and Processes

Once gathered, the articles were organized and evaluated using the matrix method (Garrard, 2011). The matrix method involved organizing the $N = 13$ articles in chronological order and in a table format (Table 1) that addressed each article regarding the following factors: author, year, purpose, sample, N , design, interventions, measures, and salient findings (including conclusions, limitations, and potential future research). The results of the literature

collected were then thoroughly analyzed to identify reoccurring themes and to obtain a full picture of the breadth and strength of the evidence surrounding the use of MBSR with nurses and other healthcare professionals.

Significant Findings, Issues, and Gaps

Study Designs

The sample consisted of 11 quantitative studies and 2 qualitative studies. The quantitative study designs included seven randomized control trials, two nonrandomized (quasi-experimental) control trials, and two pretest posttest designs. The qualitative studies consisted of one phenomenology study and one descriptive study. It should be noted that the phenomenology study conducted by Cohen-Katz, Wiley, Capuano, Baker, and Shapiro (2005a) was actually combined with Cohen-Katz et al.'s (2005a) randomized control study conducted with practicing nurses and healthcare workers. The study was written as a series of articles that divided up the quantitative and qualitative results. No studies conducted a mixed methods design that blended, compared, and discussed both quantitative and qualitative findings.

Interventions

The implementation of the MBSR course varied among the studies. Ten of the studies involved participants completing a traditional-length MBSR course spanning over a minimum of 8 weeks. Three studies involved abbreviated 4-week MBSR interventions. Studies varied on the length of the weekly group sessions, with classes ranging from 30 min to two-and-a-half hours; on the inclusion of a daylong retreat; on the requirement and length of home meditation; and on journaling requirements. Studies involving both traditional- and abbreviated-length MBSR courses both showed positive results from implementing MBSR activities. No studies adequately validated the necessary amount of MBSR participation to create optimal results. No studies were found that directly compared the results of abbreviated-length and traditional-length MBSR interventions. Finally, no studies thoroughly examined the impact of the training or experience level of the MBSR trainers on participants' outcomes. The variability in the trainers and techniques may potentially influence on the quality of the training provided.

Measures

There was a variety of measures used in the studies because of the variety in focus. The discussion regarding measures is blended into the following salient findings portion of this review.

Salient Findings

The findings of these studies suggest that MBSR is a very promising option to help nurses, healthcare professionals,

Table 1. Summary of MBSR Literature Reviewed

Author/year	Purpose	Sample and N	Design/method	Interventions	Measures	Salient findings
Shapiro et al. (1998)	To investigate the effects of MBSR on premedical and medical students.	Premedical and medical students N (initial) = 78. N (final) = 73 Gender: 56% female, 44% male Ethnicity: 79% Caucasian, 8% Hispanic, 5% Indian, 3% African, 3% Asian	Matched randomized experiment	(1) Intervention group—8-week MBSR course, meet for 2.5 hr weekly, home meditation, and daily journals (2) Control group—assigned to wait-list for MBSR course	(1) Empathy Construct Rating Scale (2) The Hopkins Symptom Checklist (3) Symptoms Checklist 90-Revised (SCL-90-R) (4) Subscale 4 of the SCL-90 (5) The State-Trait Anxiety Inventory Form (6) The Index of Core Spiritual Experiences (INSPIRIT) (7) Standard demographic measures (8) Daily journals (9) Evaluation packets	Findings: (1) Increased empathy (2) Decreased psychological distress (3) Decreased depression (4) Decreased state and trait anxiety (5) Increased spirituality Conclusion: (1) MBSR can be effective in reducing medical student's stress (2) Adherence to treatment effects outcomes Limitations: (1) Only short-term effects of MBSR (2) Students and not practicing providers (3) Self-reported results Future research: (1) Compare to other treatments (2) Add physiological factors Findings MBSR: (1) Decreased tension-anxiety (2) Decreased confusion-bewilderment (3) Increased vigor-activity (4) Decreased total mood disturbance Conclusion: (1) MBSR can be an effective stress-management intervention for medical students Limitations: (1) Not randomized (2) Students and not practicing providers (3) Only one measurement used (POMS) Future research: (1) Include students academic performance (2) Add physiological factors Findings MBSR: (1) Decreased anxiety (2) Favorable (downward) trend in stress (3) Favorable (downward) trend in Time Pressure Scale scores Conclusion: (1) MBSR can be effective in decreasing nursing students' anxiety and may increase empathy Limitations: (1) Small sample size (2) Students and not practicing providers. (3) No control group (4) All participants were women Future research: (1) Integrating MBSR into nursing curricula (2) MBSR and stress resilience
Rosenzweig et al. (2003)	To investigate the effects of MBSR on medical students.	Second-year medical students N = 302	Prospective, nonrandomized, controlled trial	(1) Intervention group—10-week MBSR course, meet for 1.5 hr weekly, and home meditation (20 min x 6 days/week) (2) Control group—seminar on complementary and alternative medicine	Profile of Mood States (POMS)	
Beddoe and Murphy (2004)	To investigate the effects of MBSR nursing students' stress and empathy.	Convenience sample of nursing students N (initial) = 23 N (final) = 18 Gender: 100% female Age: 20–39 Ethnicity: 26% Caucasian, 13% Filipino, 13% Asian, 13% Hispanic, 13% African American, 4% American Indian	Pretest, posttest design	All participants attended an 8-week MBSR program: 2-hr sessions and follow guided meditation tapes at home (30 min x 5 days/week)	(1) Demographic questionnaire (2) Interpersonal Reactivity Index (IRI) (3) Derogatis Stress Profile (4) Homework questionnaire	

Table 1. Continued

Author/year	Purpose	Sample and N	Design/method	Interventions	Measures	Salient findings
Cohen-Katz et al. (2005a)	To investigate the effects of MBSR on clinical nurses' burnout, psychological distress, mindful awareness, and attention from a quantitative perspective.	Hospital nurses (90%), also respiratory therapist, pastoral care, and social worker N (initial) = 27, N (final) = 25 Gender: 100% female Age: 32-60 (46 mean) Ethnicity: 96% Caucasian	Randomized control study	Intervention group-8-week MBSR, 2.5 hr a week, a 6-hr daylong retreat practice the techniques at home (6 days/week). Control group-wait list	(1) Maslach Burnout Inventory scale (2) Brief Symptom Inventory (3) Mindful Attention Awareness Scale (MAAS) (4) Evaluation questionnaire	Findings MBSR: (1) Decreased emotional exhaustion (2) Decreased feelings of lack of personal accomplishment (3) Trend towards significant decrease in depersonalization (4) Improvement on MAAS (5) Changes maintained 3 months post treatment Conclusion: (1) MBSR can be effective in decreasing burnout in nurses. Limitations: (1) Small sample size (2) Self-reported measures Future research: (1) Increased sample size (2) Qualitative research Findings Benefits of MBSR: (1) Increased relaxation (2) Self-acceptance (3) Self-care (4) Feeling more self-reliant (5) Increased presence in relationships (6) Increased empathy Conclusion: (1) MBSR is valuable for nurses. Limitations: (1) Small sample size (2) Heterogeneous female sample Future research: (1) Assessing nurse use of MBSR on family relationships, workplace environment, and patients
Cohen-Katz et al. (2005b)	To investigate the effects of MBSR on clinical nurses' burnout, psychological distress, mindful awareness, and attention from a qualitative perspective.	Hospital nurses (90%), also respiratory therapist, pastoral care, and social worker N = 15 Gender: 100% female Age: 32-60 (46 mean) Ethnicity: 96% Caucasian	Qualitative	8-week MBSR, 2.5 hr a week, a 6-hr daylong retreat practice the techniques at home (6 days/week)	(1) Focus group (2) Interviews (3) E-mails (4) Evaluation forms	Findings MBSR: (1) Decreased perceived stress (2) Increased self-compassion (3) Positive but NOT significant difference found in psychological distress, life satisfaction, and job burnout Conclusion: (1) MBSR may be effective in decreasing stress and increasing self-compassion in healthcare professionals. Limitations: (1) Small sample size (2) High dropout rate of participants due to MBSR being time consuming Future research: (1) Abbreviated versions of MBSR (2) Follow-up on duration of results from MBSR after study (3) Investigate if positive effects on patient care
Shapiro et al. (2005)	To investigate the effects of MBSR on healthcare professionals actively engaged in clinical practice.	Healthcare professionals (nurses, physicians, social workers, PTs, and psychologists) N = 38 Age: 18-65	Randomized control study	Intervention group-8-week MBSR, 2 hr a week Control group-wait list	(1) Brief Symptom Inventory (BSI) (2) The Maslach Burnout Inventory (MBI) (3) Satisfaction With Life Scale (4) Self-Compassion Scale (5) Perceived Stress Scale	Findings MBSR: (1) Decreased perceived stress (2) Increased self-compassion (3) Positive but NOT significant difference found in psychological distress, life satisfaction, and job burnout Conclusion: (1) MBSR may be effective in decreasing stress and increasing self-compassion in healthcare professionals. Limitations: (1) Small sample size (2) High dropout rate of participants due to MBSR being time consuming Future research: (1) Abbreviated versions of MBSR (2) Follow-up on duration of results from MBSR after study (3) Investigate if positive effects on patient care

Table 1. Continued

Author/year	Purpose	Sample and N	Design/method	Interventions	Measures	Salient findings
Galantino et al. (2005)	To investigate the effects of MBSR on healthcare workers' reported and physiological indicators of stress (salivary cortisol levels).	Healthcare workers from a single hospital N = 84 Gender: 96% female, 4% male Age: 22-75 (mean 43) Ethnicity: 56% Caucasian, 42% African American, 2% not reported	Pre- and posttest design study	All participants-8-week MBSR program, 2-hr class/week, and practice techniques at home (30 min daily)	(1) POMS (2) Salivary cortisol levels (3) MBI (4) IRI	Findings MBSR: (1) Decreased emotional exhaustion (2) Improved mood (3) No significant change in empathy (4) No significant change in salivary cortisol Conclusion: (1) Improvements in mood and emotional exhaustion from meditation did not result in a change in salivary cortisol levels Limitations: (1) Small sample size (2) Lack of control group (3) Physiological indicator did not prove significant Future research: (1) Need to monitor other physiological indicators of stress
Mackenzie et al. (2006)	To investigate the effects of a brief MBSR program on nurses and nurse aides working in a nonclinical setting.	Consisting of registered nurses and nurse aides. N = 30 Gender: 97% female, 3% male Age: mean 46.7	Randomized control study	Intervention group-4-week MBSR, 30-min group sessions/week, CD of guided mindfulness exercises for home (10 min x 5 days/week). Control group-wait list	(1) 13-item version of Antonovsky's Orientation to Life Questionnaire (2) Satisfaction With Life Scale (3) Intrinsic Job Satisfaction Subscale (4) Maslach Burnout Inventory (5) Smith Relaxation Dispositions Inventory	Findings MBSR: (1) Decreased symptoms of burnout (2) Increased life satisfaction (3) Increased relaxation (4) Increased (but NOT significantly) sense of coherence Conclusion: (1) Brief MBSR may be effective in reducing symptoms of burnout, increasing life satisfaction and relaxation. Limitations: (1) Small sample size (2) Heterogeneous sample (3) Uncertain if full length MBSR would have increased positive results Future research: (1) Compare brief MBSR with 8-week MBSR
Jain et al. (2007)	To investigate the effects of a mindfulness meditation versus somatic relaxation training and a control group in healthcare students.	Variety of undergraduate and graduate nursing, medical, and health science students. N = 81 Gender: 81% female, 19% male Age: 18-61 (mean 25) Ethnicity: 63% White, 16% Hispanic, 4.9% Native American, 7.4% Pacific Islander, 2.5% mixed, 6.2% not reported	Randomized control study	Mindfulness meditation group-4-week MBSR, 1.5-hr classes/week, and homework somatic relaxation (SR) training group-techniques of autogenic relaxation classes and homework Control group-wait-listed for either MBSR or SR	(1) BSI (2) Positive States of Mind Scale (3) Index of Core Spiritual Experiences (INSPIRIT-R) (4) Marlowe-Crowne short form (5) Daily Emotion Report (6) Practice log	Findings: (1) MBSR and SR decrease in distress (2) MBSR had greater decrease in distress (3) MBSR and SR increase in positive affect (4) MBSR had greater increase in positive affect (5) MBSR decrease distractive, ruminative thoughts and behaviors (unique to MBSR) (6) No significant differences found in spiritual awareness Conclusion: (1) MBSR and SR may be effective in decreasing stress and improving positive mood states. MBSR may be unique in decreasing distractive, ruminative thoughts and behaviors. Limitations: (1) Healthcare students and not practicing professionals Future research: (1) Further validate this study's findings with practicing healthcare professionals

Table 1. Continued

Author/year	Purpose	Sample and N	Design/method	Interventions	Measures	Salient findings
Shapiro et al. (2007)	To investigate the effects of MBSR on mental health of therapists in training.	Master's level counseling psychology students from a private Jesuit university. N (initial) = 64, N (final) = 54 Gender: 88.9% female, 11.1% male Age: Average 29.2 Ethnicity: 76.9% Caucasian, 7.7% Latino, 5.8% Asian, 3.8% Filipino, 1.9% African American, 1.9% Portuguese, 1.9% Persian, 3.8% not reported	Prospective, nonrandomized, cohort controlled trial	Intervention group—10 weekly (3 hr) stress and stress-management classes. Included 8-week MBSR including 2-hr weekly sessions. Control group—either research methods and psychological theory courses for 10 weeks (3 hr)	(1) MAAS (2) Positive and Negative Affectivity Schedule (3) Perceived Stress Scale (4) State-Trait Anxiety Inventory (STAI) (5) Reflective Rumination Questionnaire (6) Self-Compassion Scale	Findings MBSR: (1) Decreased stress (2) Decreased negative affect (3) Decreased rumination (4) Decreased state and trait anxiety (5) Increased positive affect (6) Increased self-compassion Conclusion: (1) MBSR can be effective in producing positive effects on mental health of therapist students. Limitations: (1) Not randomized (2) Potential motivation of students enrolling in MBSR (3) Small sample size Future research: (1) Follow up to determine if results are lasting (2) Effects of MBSR on therapists in practice and their relationship with clients Findings MBSR: (1) Increased awareness (2) Increased acceptance (3) Increased self-learning (4) Increased self-empowerment (5) Increased focus/concentration (resulting in increased ability to complete term papers) Conclusion: (1) MBSR can be effective in facilitating enhanced awareness and acceptance for students of social work. Limitations: (1) No consistent requirements for homework meditation practice (2) Open enrollment/attendance for students into MBSR classes (students could enter after classes already started). Only five students consistently attended. Future research: (1) Incorporating MBSR into social work curriculum (2) Incorporating academic performance into outcome measures
Birnbaum (2008)	To investigate the effects of mindfulness training on social work students.	Third-year BA, social work students N = 12	Qualitative/phenomenological investigation	All participants attended MBSR classes—8 week-MBSR program, 2-hr class/week	(1) Notes taken by facilitator during sharing process (2) Group's stream-of-consciousness writing	

Table 1. Continued

Author/year	Purpose	Sample and N	Design/method	Interventions	Measures	Salient findings
Pipe et al. (2009)	To investigate the effects of mindfulness meditation on nurse leaders.	Nurse leaders N (initial) = 33 N (final) = 32 Gender: 97% female, 3% male Age: 33–63 (mean 49.8)	Randomized control trial	Intervention group—4-week MBSR program, 5-2-hr long classes total and 30 min of daily practice Control group—structured educational series on stress and leadership strategies	(1) SCL-90-R (2) The Caring Efficacy Scale	Findings MBSR: (1) Improved mood (2) Decreased self-reported symptoms of stress (3) Decreased self-reported symptoms of anxiety (4) Both MBSR and control group showed (NOT significant) increase in caring efficacy Conclusion: (1) Stress program based on MBSR can be effective in decreasing stress and anxiety in nursing students Limitations: (1) Only one male participant (2) Originally planned to be a longitudinal randomized controlled trial over 12 months—but it was later modified to 4 weeks. (3) Selection bias—recruiting motivated nurses to participate (4) Small sample size Future research: (1) Comparing 4-week and 8-week MBSR programs (2) Evaluating other stress management approaches
Kang et al. (2009)	To investigate the effects of a stress-coping program based on mindfulness meditation on the stress, anxiety, and depression experienced by nursing students in Korea.	Convenience sample of junior and senior nursing students at a single university in Korea. N (initial) = 41, N (final) = 32 Gender: 100% female	Randomized, nonequivalent control group pretest-posttest design.	Intervention group—1.5-hr lecture on stress and coping. Then 8 weekly mindful meditation classes 1.5-2-hr long Control group—1.5-hr lecture on stress and coping. No further interventions after initial lecture.	(1) Psychosocial Well-Being Index-Form (2) STAI (3) Beck Depression Inventory (4) Demographic/lifestyle (smoking, exercise, and alcohol consumption) questionnaire (5) Blood pressure and pulse	Findings the stress coping program based on MBSR: (1) Decrease in stress (2) Decrease in anxiety (3) No significant difference in depression Conclusion: (1) Stress program based on MBSR can be effective in decreasing stress and anxiety in nursing students Limitations: (1) All female participants removed from study for missing more than two meditation classes (3) Did not specify amount if any home meditations required Future research: (1) Long-term studies to standardize and detail the program

BA, Bachelor of Arts; MBSR, mindfulness-based stress reduction; PT, physical therapy.

and health science students deal with stress. However, the benefits of MBSR use are greater than dealing with stress alone. The benefits are organized into reoccurring themes and discussed later.

Decreased stress. Stress is not an easily defined concept, which resulted in many of the studies failing to offer a working definition of stress (Wheeler, 1997). The lack of a working definition of stress was a consistent issue in the studies reviewed. Stress is a biopsychosocial response to either positive or negative factors in one's environment (Wheeler, 1997). Stress can be caused by numerous factors, including workplace conditions, relationships at or outside of work, health issues, and financial problems. Davies (2008) warns that the consequences of nurse stress can include decreased focus, exhaustion, and burnout. According to NANDA-International, ineffective coping with stress can result in inability to meet needs of self and others, ineffective problem solving, alterations in behavior, and changes in communication (Varcarolis, 2011). One of the most frequently occurring themes among the studies reviewed was the validation of the usefulness of MBSR with decreasing nurses' and other healthcare professionals' stress and other stress-related symptoms. Synthesizing the significant findings of these studies concludes that MBSR decreased participants' stress (Beddoe & Murphy, 2004; Kang, Choi, & Ryu, 2009; Pipe et al., 2009; Shapiro, Astin, Bishop, & Cordova, 2005; Shapiro, Brown, & Biegel, 2007), decreased distress (Jain et al., 2007; Shapiro, Schwartz, & Bonner, 1998), decreased emotional exhaustion (Cohen-Katz et al., 2005a; Galantino, Baime, Maguire, Szapary, & Farrar, 2005), decreased time-related pressures (Beddoe & Murphy, 2004), decreased burnout (Mackenzie, Poulin, & Seidman-Carlson, 2006), and increased relaxation (Cohen-Katz, Wiley, Capuano, Baker, & Shapiro, 2005b; Mackenzie et al., 2006).

Stress measures. In the quantitative studies that focused on stress, six measures were used to measure stress. One study used the Psychosocial Well-Being Index-Form created by Chang (2000). One study used the Smith Relaxation Dispositions Inventory created by Smith (2001). Two studies used the Hopkins Symptom Checklist SCL-90-R created by Derogatis (1977). One study used the Derogatis Stress Profile created by Derogatis (1987). Three studies used the Brief Symptom Inventory created by Derogatis and Melisaratos (1983). Two studies used the Perceived Stress Scale created by Cohen, Kamarck, and Mermelstein (1983). The qualitative study by Cohen-Katz et al. (2005b) used focus groups, interviews, e-mails, and evaluation forms to measure stress.

Decreased burnout. Cohen-Katz et al. (2005a, p. 28) defined nurse burnout as "a syndrome with 3 factors: emotional exhaustion, depersonalization, and reduced personal accomplishment." Nurse burnout has been linked to decreased patient satisfaction (Vahey et al., 2004),

increased 30-day mortality rates, decreased job satisfaction, and high job-turnover rates (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002). The studies involved in this analysis suggest that MBSR may help with decreasing burnout in nurses (Cohen-Katz et al., 2005a; Galantino et al., 2005; Mackenzie et al., 2006; Shapiro et al., 2005). Additionally, Mackenzie et al. (2006) found an increase in participants' job satisfaction levels after participating in a brief MBSR program, which also may lead to decreased burnout.

Burnout measures. In the quantitative studies that focused on burnout, two measures were used. One study used the Intrinsic Job Satisfaction Subscale created by Koeske, Kirk, Koeske, and Rauktis (1994). Four studies used the Maslach Burnout Inventory (MBI) created by Maslach, Jackson, and Leiter (1996). Neither of the qualitative studies measured burnout.

Decreased anxiety. The studies reviewed lacked clear operational definitions of anxiety. Review of the articles leads to the conclusion that anxiety is fear, dread, and nervousness associated with perceived or actual stressors. Anxiety can impair an individual's cognitive function and learning (MacIntyre & Gardner, 1994). In the healthcare profession, cognitive functioning and learning is essential to ensure provider competence and patient safety. In the studies reviewed, MBSR proved to decrease anxiety (Beddoe & Murphy, 2004; Kang et al., 2009; Pipe et al., 2009; Rosenzweig et al., 2003; Shapiro et al., 1998, 2007).

Anxiety measures. In the quantitative studies that focused on anxiety, three measures were used. Two studies used the Hopkins Symptom Checklist SCL-90-R (Derogatis, 1977), three studies used the State-Trait Anxiety Inventory Form (Spielberger, Gorsuch, & Lushene, 1970), and three studies used the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1992). The qualitative study by Cohen-Katz et al. (2005b) used focus groups, interviews, e-mails, and evaluation forms to measure anxiety.

Improved focus. A top-reported benefit of MBSR among the studies reviewed was improved focus, which took form in reports of decreased distractive ruminative thought and behaviors (Jain et al., 2007; Shapiro et al., 2007), increased mindful attention and awareness (Cohen-Katz et al., 2005a), increased concentration (Birnbbaum, 2008), and decreased confusion (Rosenzweig et al., 2003). Decreasing distracting thoughts and increasing cognition may assist nurses in providing safer patient care.

Focus measures. In the quantitative studies that examined MBSR's impact on focus and concentration, four measures were used. One study used the Reflective Rumination Questionnaire (Trapnell & Campbell, 1999), one study used the Daily Emotion Report (DEM; Nolen-Hoeksema, Morrow, & Fredrickson, 1993), three studies used the POMS (McNair

et al., 1992), and two studies used the Mindful Attention Awareness Scale (Brown & Ryan, 2003). In the two qualitative studies that examined focus and concentration, measures included focus groups, facilitator's notes, interviews, e-mails, and evaluation forms.

Self-improvement. The studies' critics found that MBSR benefited participants in a variety of self-improvement aspects, including increased self-care (Cohen-Katz et al., 2005b); increased feelings of empowerment (Birnbaum, 2008); increased self-reliance, acceptance, and compassion (Birnbaum, 2008; Cohen-Katz et al., 2005b; Shapiro et al., 2005, 2007); increased self-learning (Birnbaum, 2008); increased spirituality (Shapiro et al., 1998); and decreased feelings of lack of personal accomplishment (Cohen-Katz et al., 2005a).

Self-improvement measures. In the quantitative studies that examined MBSR's impact on self-improvement and self-acceptance, six measures were used. One study used the Positive and Negative Affectivity Schedule (Watson, Clarke, & Tellegen, 1988), one study used the DEM (Nolen-Hoeksema et al., 1993), one study used the 13-item version of Antonovsky's Orientation to Life Questionnaire (Antonovsky, 1987), two studies used the Self-Compassion Scale (Kneff, 2003), two studies used the Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), and four studies used the MBI (Maslach et al., 1996). In the two qualitative studies, measures included focus groups, facilitator's notes, interviews, e-mails, and evaluation forms.

Increased empathy. Empathy was not a frequently noted theme. This may be because only four studies specifically measured the trait. However, because the trait is so important to the profession of nursing, the findings of the studies warranted discussion. The use of MBSR was associated with increased empathy in medical and nursing students (Beddoe & Murphy, 2004; Shapiro et al., 1998) and increased empathy in acute care nurses (Cohen-Katz et al., 2005b). The use of MBSR was not found to increase empathy in a study involving a variety of practicing health-care workers (Galantino et al., 2005). Galantino et al. concluded that one possible explanation for the lack of a significant increase in empathy in their study may have been contributed to the Interpersonal Reactivity Index (IRI) used to measure empathy lacking sensitivity for the trait.

Empathy measures. In the quantitative studies that examined MBSR's impact on self-improvement and self-acceptance, four measures were used. One study used the IRI (Davis, 1980), one study used the Empathy Construct Rating Scale (La Monica, 1981), three studies used the POMS (McNair et al., 1992), and one study used the IRI (Davis, 1980). The qualitative study by Cohen-Katz et al. (2005b) used focus groups, interviews, e-mails, and evaluation forms to measure empathy.

Improved mood. The theme of improved mood was evident in study findings concluding that MBSR decreased total mood disturbances (Rosenzweig et al., 2003), improved mood (Galantino et al., 2005; Pipe et al., 2009), decreased depression (Shapiro et al., 1998), increased positive affect (Beddoe & Murphy, 2004), and decreased negative affect (Shapiro et al., 2007).

Mood measures. In the quantitative studies that examined MBSR's impact on mood, four measures were used. One study used the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erdaugh, 1961), two studies used the Hopkins Symptom Checklist SCL-90-R (Derogatis, 1977), three studies used the POMS (McNair et al., 1992), and one study used the DEM (Nolen-Hoeksema et al., 1993). Neither of the qualitative studies measured mood.

Implications for Research, Knowledge Development, and Practice

Research and Knowledge Development

Although these studies reported very positive findings with the use of MBSR with nurses, other healthcare professionals, and health science students, there are still numerous limitations that lead to potential areas for further research and knowledge development. These areas identified are discussed later.

More focus on nursing. Future research should include more studies focused specifically on practicing nurses. Of these 13 studies discussed, only six included nurses in practice. Of these six studies, one focused on non-clinical nurses and nurse aides, four focused on healthcare professionals (including nurses), and one focused on nurse leaders. Future research studies should focus more on practicing clinical nurses and more specifically on specialties and varying environments within nursing (acute care, ambulatory care, public health, etc.). Drawing conclusions based on the benefits of MBSR with students may not necessarily be representative of practicing nurses because academic stressors may be different from practice stressors.

Ripple effect of MBSR. Future studies could investigate the "ripple effect" of MBSR on nurses' clinical performance, competencies, patient outcomes, interactions, or relationships with patients, coworkers, and family. Stress has been associated with nurses' reports of decreased ability to focus on patient needs and patient's reports of decreased satisfaction with care (Beddoe & Murphy, 2004; Vahey et al., 2004). MBSR has been found to decrease nurses' stress and increase nurses' ability to focus, increase attention, and decrease distractive, ruminative thoughts and behaviors (Birnbaum, 2008; Shapiro et al., 2007; Cohen-Katz et al., 2005a, 2005b). Galantino et al. (2005) reported increased scores on patient satisfaction surveys following the implementation of the mindfulness meditation program. In addi-

tion, future research should investigate the long-term use of MBSR. Pipe et al. (2009) intended to conduct a 12-month longitudinal study, but because of the significant difference in stress levels observed between the MBSR treatment group and the control group at the end of 4 weeks, the length of the study was shortened. The reality is that stress is a long-term professional hazard for nurses and all health-care professionals. To be effective, stress-coping interventions need to continue to provide benefits to the user beyond the 8 weeks of the MBSR program period.

Length of MBSR. Some studies utilized traditional 8-week MBSR programs while others had significant results with abbreviated MBSR programs. Length of classes and requirements for independent meditation of participants also varied among the studies. This leads to uncertainty regarding what is the minimal effective “dose” of MBSR to maintain stress-relieving benefits. Future research could be conducted comparing traditional-length MBSR programs with abbreviated MBSR programs. A focus could be placed on the amount of participant meditation time and severity of the results.

MBSR compared with other relaxation methods. MBSR could be compared with other meditation or relaxation programs. Jain et al. (2007) did compare the abbreviated 4-week version of MBSR with a somatic relaxation training program, but there are still far more programs that MBSR could be compared to. A few studies have investigated the effectiveness of the EPP and even a computer-based meditation program, but no studies were found that have compared either methods to MBSR (Cutshall et al., 2011; Easwaran, 1991; Oman, Thoresen, & Hedberg, 2010; Oman et al., 2006).

Practice

Based on the studies reviewed, it is evident that the potential benefits to utilizing MBSR in nursing practice are plentiful. As the healthcare industry continues to grow, technology continues to evolve, and demands on nurses continue to mount; it is exciting to have a tool to help manage nurse stress. This is significant because self-improvement, empathy, and improved mood are related to stress. Additionally, such positive changes are unlikely to be limited to the individual nurse participating in MBSR. MBSR has the potential to improve patient care and nurse clinical environments. As further studies are conducted to validate the benefits of MBSR for practicing nurses and to investigate the impact on patient care, justification may be found for policy changes in the workplace leading to MBSR being routinely offered to nurses.

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