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The Efficacy of Mindfulness Based Stress Reduction (MBSR) for Decreasing Anxiety and Depression among Breast Cancer Survivors

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The Efficacy of Mindfulness Based Stress Reduction (MBSR) for Decreasing Anxiety and Depression among Breast Cancer Survivors

Abstract
Background: Breast cancer is one of the most common cancer diagnoses in women, where 1 in 8 women will be diagnosed with the disease in their lifetime. Due to advancements in treatment, therapy, and early diagnosis, women are living longer with the disease. Interventions focus on managing symptoms through active cancer treatment; however, few interventions focus on treatment of symptoms at survivorship and beyond. Mindfulness based stress reduction (MBSR) is a validated interventional program that patients can use to help manage depression and anxiety associated with the disease. The following review aims to determine the continuing efficacy of MBSR on reducing anxiety and depression among breast cancer survivors.

Methods: An exhaustive search of available medical literature was performed using MEDLINE- Pubmed, Clinical Key, and Web of Science. Keywords used included: mindfulness, breast cancer, survivors, RCT, and MBSR. Studies were assessed for quality using GRADE criteria.

Results: Thirty-seven articles were reviewed. After screening the titles and abstracts for eligibility, a total of two articles met the inclusion criteria. These studies were randomized control trials that included an 8-week MBSR program. These studies showed an improvement in anxiety or depression post-intervention. While MBSR is effective, further studies need to focus on sub-group analysis and long-term benefits past 12-months.

Conclusion: MBSR is cost-effective and beneficial in reducing anxiety and depression among breast cancer survivors up to 12-months post-intervention.

Keywords: Mindfulness based stress reduction, breast cancer, survivors, anxiety, depression, randomized control study.
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The Efficacy of Mindfulness Based Stress Reduction (MBSR) for Decreasing Anxiety and Depression among Breast Cancer Survivors

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and
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A Clinical Graduate Project Submitted to the Faculty of the
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Faculty Advisor: Annjanette Sommers, PA-C, MS
Brent Norris, PA-C, MS

Clinical Graduate Project Coordinator: Annjanette Sommers, PA-C, MS
Biography

[Redacted for privacy]
Abstract

Background: Breast cancer is one of the most common cancer diagnoses in women, where 1 in 8 women will be diagnosed with the disease in their lifetime. Due to advancements in treatment, therapy, and early diagnosis, women are living longer with the disease. Interventions focus on managing symptoms through active cancer treatment; however, few interventions focus on treatment of symptoms at survivorship and beyond. Mindfulness based stress reduction (MBSR) is a validated interventional program that patients can use to help manage depression and anxiety associated with the disease. The following review aims to determine the continuing efficacy of MBSR on reducing anxiety and depression among breast cancer survivors.

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Acknowledgements

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Table 1: Quality Assessment of Reviewed Studies

List of Abbreviations

BC Breast Cancer
CAM Complimentary and Alternative Medicine
CES-D Center for Epidemiological Studies Depression Scale
FACT- B Functional Assessment of Cancer Therapy-Breast
FACT- ES Functional Assessment of Cancer Therapy- Endocrine Symptoms
GRADE Grading of Recommendations, Assessment, Development, and Evaluation
HRQOL Health Related Quality of Life
MBSR Mindfulness Based Stress Reduction
MBSR(BC) Mindfulness Based Stress Reduction- Breast Cancer
POMS Profile of Mood States Score
QOL Quality of Life
RCT Randomized Control Trial
SCLE-90r Symptom Checklist- 90r
WHO-5 World Health Organization Well-Being Index
The Efficacy of Mindfulness Based Stress Reduction (MBSR) in Decreasing Anxiety and Depression among Breast Cancer Survivors

BACKGROUND

Breast cancer remains one of the most common cancer diagnoses among women, with the exclusion of skin cancers, and is the second leading cause of cancer mortality among women. In the United States 1 in 8 women will be diagnosed with breast cancer in their lifetime. The common nature of this disease indicates a critical need for management of the breast cancer patient throughout their lifespan. Breast cancer survivorship has improved due to early identification, novel treatments, and improved therapies. According to the American Cancer Society, breast cancer death rates have decreased by 36% from 1989 to 2012, accounting for approximately 250,000 breast cancer deaths being averted. At breast cancer diagnosis and throughout therapy, patients’ quality of life (QOL) is dramatically affected with an increase in psychological stress, anxiety, depression, and fear of disease recurrence. Post treatment, breast cancer survivors report ongoing psychological symptoms (ie, depression and anxiety) with limited options for symptom management. With an increase in post-treatment survivorship, it remains essential to continue managing breast cancer patients during this transitional period and beyond.

Many interventions focus on managing symptoms during the course of cancer therapy through telephone interpersonal counseling and peer-counseling, to name a few. However, there are limited interventions aiming to address the psychological stressors post-treatment (ie, self-management skills programs and psycho-educational/physical activity interventions). In contrast to interventions focusing on cognitive behavioral and educational approaches, breast cancer survivors are gravitating towards complementary and alternative medicine therapies (CAM).
CAM has demonstrated significant efficacy in management of many different medical conditions, especially the psychological distress related to cancer diagnosis and treatment (ie, depression and anxiety). According to Lengacher et al. (2002), 10 64-86% of breast cancer survivors utilized CAM to alleviate psychological distress. Approximately 30-40% of people with major depression exhibit a limited response to traditional pharmacotherapy and psychotherapy. 11 Thus, CAM remains a safe and cost-effective modality for patients with physical and mental health related disorders. 12 Several clinical scenarios have demonstrated CAM related efficacy in supportive management of mental health disorders, including but not limited to, patients who do not respond to antidepressant therapy or have drug related side-effects to first-line treatment. 11 Woolery et al showed, 2 one-hour Iyengar yoga sessions reduced depression scores among 28 patients as compared to the control group. With over 120 CAM treatments available (eg, acupuncture, yoga, and aromatherapy) medical management of mental health disorders, especially mood disorders, is developing an integrative and holistic approach. 11

The frequency of CAM among breast cancer patients has increased, with patients aiming to reduce psychological distress. 10,14 According to Boon et al. 15 in 2005 more than 80% of Canadian women with breast cancer reported using CAM, with 41% of those women using CAM to manage breast cancer symptoms. Mindfulness based stress reduction (MBSR) is a type of CAM that has proven effective in managing the psychological stressors associated with breast cancer and survivorship. 16,17

MBSR is a standardized program that combines meditation and yoga to reduce psychological stress by developing mindfulness, a type of focused personal awareness. The concept of mindfulness has Buddhist origins, but the intervention is not religiously or culturally focused. The program consists of 8, weekly, 2-hour sessions, with approximately 20 participants,
a 6-hour retreat between weeks 6 and 7, and 45 minutes of daily home assignments using a mindfulness CD. Sessions focus on 3 types of exercises, including gentle yoga exercise, body scanning, and sitting meditation. The aim of this study is to determine if the MBSR program reduces anxiety and depression among breast cancer survivors. It is also warranted to determine the continuing benefits of the MBSR program for breast cancer survivors.

METHODS

An exhaustive literature search using MEDLINE-Pubmed, Clinical Key, and Web of Science was completed using key words such as, mindfulness, breast cancer, survivors, RCT, and MBSR. The search was narrowed to include the following eligibility criteria: American/European studies, randomized control trials (RCT), studies using patients who are breast cancer survivors and >18 years old, articles in the last 10 years, human studies, studies published in the English language, studies on patients who completed treatment within the last 2 years of enrollment and were diagnosed stage 0-III breast cancer survivors, and studies using the validated 8-week MBSR program. Relevant articles were assessed for quality using the Grading of Recommendations, Assessment, Development and Evaluation (GRADE).

RESULTS

A total of 37 articles were reviewed. After screening the titles and abstracts for eligibility, 2 articles met the inclusion criteria. Both of these articles were randomized control studies. Two additional articles were found that compared a modified breast cancer MBSR program to usual care. These 2 articles were excluded because the duration of the program was only 6 weeks as compared to the original 8-week validated MBSR program. See table 1.
This randomized control study assessed the efficacy of MBSR on reducing self-reported levels of anxiety and depression in 336 breast cancer survivors, age 18-75 years. Participants had undergone operative intervention within 3-18 months of study enrollment for stage I-III breast cancer at either the Herlev or Ringsted hospitals in Denmark between 2008-2010. After review of hospital records, patients who met the inclusion criteria were invited to participate in the study by mail. The participants were then randomized 1:1 by use of web interface into usual care or usual care plus MBSR.

Two self-report scales were used, the Symptom Checklist-90r (SCLE-90r) and the Center for Epidemiological Studies Depression Scale (CES-D). The SCLE-90r evaluates anxiety and depression subscales on a five-point scale, zero indicating absence of symptoms to four showing significant psychological disturbance. The CES-D is a 20-item inventory which focuses on cognitive manifestations of depression, scored from 0 (symptoms reported none of the time) to 3 (symptoms reported most or almost all of the time). The inventories were administered before randomization, and at 2, 6, and 12 months after the intervention.

Anxiety and depression decreased in both groups over time, although at the beginning of the study the mean SCLE-90r and CES-D scores were lower in the MBSR group as compared to usual care. At 6-months follow up a significant improvement was seen for anxiety (p=0.05) and depression (SCL-90r, p=0.01; CES-D, p=0.03). At 12-months follow up there was a statistically significant improvement in the SCLE-90r depression scale (p=0.01). However, at 12-months follow up there was no significant improvement in the CES-D (p=0.22) or SCLE-90r anxiety scale (p=0.08). Results also showed that patients with increased anxiety and depression at
baseline had a significant decrease in symptoms after the MBSR intervention, while no
differences were seen for participants who had less psychological burden at baseline.\textsuperscript{16}

**Hoffman et al**

This randomized control study\textsuperscript{17} aimed to evaluate the effectiveness of MBSR on mood, breast- and endocrine-specific quality of life, and overall well-being among 229 women age 18-80 years after treatment for breast cancer. Participants had undergone surgery, chemotherapy, and/or radiation within the last 2 months to 2 years prior to study enrollment. Participants were recruited over 15 months from The London Haven. The participants were then randomized by the operations director of the organization, who was independent from the study through use of a computer generated randomization program; allocation concealment was maintained. The study participants were allocated to either MBSR or a waitlist control.\textsuperscript{17}

The study used the Profile of Mood States Score (POMS) to evaluate mood (ie, anxiety, depression, anger, vigor, fatigue, and confusion). The POMS contains 65 word statements that describe feelings. A 5-point Likert Scale was used to evaluate how patients feel about each statement, from 0 (“not at all”) to 4 (“extremely”). The inventory was administered at T1 (baseline, weeks -2 to 0), T2 (weeks 8 to 12 post intervention), and T3 (weeks 12 to 14 post intervention). Secondary outcomes were evaluated using Functional Assessment of Cancer Therapy-Breast (FACT-B), Functional Assessment of Cancer Therapy-Endocrine Symptoms (FACT-ES), and the 5-item World Health Organization Well-Being Index (WHO-5); however, these scales are not relevant in this analysis.\textsuperscript{17}

The data shows MBSR to have a positive effect on mood disturbance as seen on self-reported POMS between treatment groups. Data showed a statistically significant decrease in the mean difference of anxiety symptoms in the MBSR intervention group compared to the control
group at both T2 (-2.93, 95% CI: -4.67 to -1.20) and T3 (-2.30, 95% CI: -3.96 to -0.63) measurements, and only a statistically significant decrease in the mean difference of depression at T2 only (-3.39, 95% CI: -6.06 to -0.71).17

DISCUSSION

Breast cancer continues to evolve as a chronic condition among women, as a result of early diagnosis and improved treatments, which have reduced overall mortality. With improved breast cancer outcomes, it is important to consider therapies to reduce associated morbidities that continue throughout the life span of the patient. Interventions tend to focus on the immediate psychological effects of cancer during initial phases; however, they fail to consider the extended sequelae of the disease among survivors. MBSR has proven effective in managing post-treatment challenges. This analysis aims to determine the continuing efficacy of MBSR in decreasing anxiety and depression among breast cancer survivors. It is imperative to provide patients with the necessary tools to cope and manage their disease going forward.

This systematic review was able to uncover two critical studies16,17 that demonstrated the continuing benefits of MBSR in reducing anxiety and depression among breast cancer survivors. At 6-months follow-up, Wurtzen et al16 found that MBSR significantly improve anxiety and depression. However, at 12-months, there was a statistically significant improvement in the SCLE-90r depression scale, but not for the SCLE-90r anxiety scale or the CES-D depression scale.16 In the Hoffman et al17 study, MBSR reduced anxiety at T2 (8 to 12 weeks post-intervention) and T3 (12 to 14 weeks post-intervention) according to the POMS scale. In contrast, depression decreased at T2, but not at T3.13

It remains difficult to compare the two studies since both use different inventories to measure anxiety and depression. The POMS is comprised of 65 word statements that describe
feelings. In contrast, the SLCE-90r and CES-D measure the presence or absence of symptoms. While both studies take a different approach, both scales determine the level of clinical anxiety or depression.

The discrepancy in outcome between the two studies could be due to the lack of subgroup analyses. This remains one of the largest limitations in assessing the quality of this evidence, see Table 1. Both studies did not isolate groups of patients who had higher levels of anxiety and depression before the MBSR intervention. While the studies did screen for patients’ psychological status before the intervention, they did not do a subgroup analysis for depression or anxiety. Thus, it remains difficult to determine if people who were previously diagnosed with depression or anxiety showed improvements after MBSR. It is possible that the populations isolated in both studies were not clinically anxious or depressed at base-line, thus creating a type of floor effect. The intervention group included patients who were not clinically anxious or depressed as well as patients who fell on a spectrum of these disorders. Thus, it is hard to examine the true magnitude of effect of MBSR on anxiety and depression.

Another limitation found in the GRADE analysis, included identification of a risk of selection bias in both studies. In the Wurtzen et al study, patients who met inclusion criteria from the Herlev or Ringsted hospitals were invited to participate in the study and then randomized. Hoffman et al recruited patients from The London Haven, a day center that provides psychological therapies for patients with breast cancer. Patients were then randomized into the MBSR intervention or the usual care groups. Both studies have an inherent selection bias, in which, patients’ selected to be enrolled in the study. Thus, these patients had a unique motivation to be a part of an MBSR interventional program.
The MBSR intervention improved psychological states in breast cancer survivors, irrelevant of their initial psychological status, or personal interest in the program. Both studies showed improvement in the MBSR intervention group. The above limitations should not deter healthcare providers from educating breast cancer survivors about MBSR, especially because there is low risk and cost associated with this intervention. A study conducted by Lengacher et al (2015) found that MBSR is cost-effective and improved health related quality of life (HRQOL). The total direct cost of a 6-week modified MBSR program, MBSR(BC), averaged $666 dollars for each participant, in which MBSR materials were less than 1% of direct costs. In addition, some patients do not respond to and experience adverse side effects of pharmacotherapy, further supporting the benefit of the MBSR program.

Further studies are warranted to examine the long-term effects of MBSR on reducing anxiety and depression in breast cancer survivors. Additional studies should focus on the extended benefits of MBSR past the 12-month interval of the Wurtzen et al study. Future studies should include a sub-group analysis that specifically looks at patients who are diagnostically anxious or depressed prior to implementation of the MBSR intervention.

CONCLUSION

While the long-term benefits of MBSR need to be further elucidated, studies show that MBSR provides continuing psychological benefit to patients. Among breast cancer survivors, MBSR was effective at reducing overall anxiety and depression. However, this depended on the inventory used to evaluate the psychological status of the patients, pre- and post- intervention (ie, POMS, CES-D, and SCLE-90r). For a relatively low cost and no harm, MBSR can be used as an effective interventional tool for patients who are suffering from the sequelae associated with breast cancer survivorship. Providers often stop treatment once a patient enters remission;
however, it is important to consider that a survivor may need additional help to embody a healthy lifestyle. The treatment should not stop at remission. MBSR is a simple intervention that could potentially add years of enjoyment to someone’s life.
References


Table 1: Quality Assessment of Reviewed Articles

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Number of studies</th>
<th>Study Designs</th>
<th>Limitations</th>
<th>Indirectness</th>
<th>Inconsistency</th>
<th>Imprecision</th>
<th>Publication bias</th>
<th>Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>2</td>
<td>RCT</td>
<td>Serious(^a,b)</td>
<td>Not Serious</td>
<td>Not Serious</td>
<td>Not Serious</td>
<td>Unlikely</td>
<td>Moderate</td>
</tr>
<tr>
<td>Depression</td>
<td>2</td>
<td>RCT</td>
<td>Serious(^a,b)</td>
<td>Not Serious</td>
<td>Not Serious</td>
<td>Not Serious</td>
<td>Unlikely</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

\(^a\) Risk of selection bias due to motivated participants in both studies: Hoffman et al\(^{13}\) and Wurtzen et al.\(^{16}\)

\(^b\) Lacked subgroup analysis differentiating severity for each specific outcome in both studies: Hoffman et al\(^{13}\) and Wurtzen et al.\(^{16}\)