ABSTRACT

Introduction

A growing number of psychosocial interventions are being offered to cancer patients during and after their medical treatment. Here, we examined whether Mindfulness-Based Stress Reduction (MBSR®), a stress management course, helps women to cope better with stress and illness once their breast cancer treatment is completed. Our aim was to understand how MBSR may

with 4 variables in the model at an alpha level of 0.05 and a power of 0.80.

2.3 Intervention: MBSR Program

The MBSR program (described in Kabat–Zinn[3]) was provided by the same instructor (PLD) to 5 different groups of 10–15 women per group, who met weekly for 2.5-hour classes over 8 consecutive weeks to learn mindfulness meditation and stress management techniques. Patients received a home practice manual and 4 compact discs created by the instructor to teach these meditation practices: body scan, sitting meditation, hatha yoga, and meditation involving visual imagery. The structured classes progressively taught means of coping with stress through meditation practice and dialogue about the practice in and out med EMC /Span <</MCID 12767 >>BDC B23DC B23DC B23DC B23DC B23DC B0 10 551e11( )-B

PHDVXUHV VKRZHG VLJQL¿FDQ correction for multiple testing (Bonferroni correction ZLWK . DQG WHVWV \ $p =$ 0.0042): depressive symptoms ($p < 0.0001$), perceived stress ($p < 0.0001$), and medical symptoms ($p < 0.0001$). 6LJQL¿FDQW FKDQJHV ZHUH D

TABLE I Participant ($n = 59$) demographics

Variable	Value
Age (years)	
Mean	56.4±10.2
Range	28–79
Time since completion of breast cancer treatment (months)	
Mean	28.9±58.8
Range	2–340
Years of education [n (%)]	
High school leaving	7 (11.9)
College degree	13 (22.8)
Undergraduate degree	26 (44.1)
Master’s degree	9 (15.3)
Doctorate	4 (6.8)
Cancer stage [n (%)]	
Stage 0	2 (3.4)
Stage 1	17 (28.8),
Stage 2	20 (33.9).
Stage 3	2 (3.4)
Stage 4	6 (10.2)
Unknown	12 (20.3)

measures of distraction coping (increased, $p = 0.001$); emotional coping (decreased, $p < 0.0001$); and mindfulness, comprehensibility, meaningfulness, and total sense of coherence (all increased, $p < 0.0001$).

&RUUHODWLRQ FRHI¿FLHQWV ZH the associations between change scores and the changes in process and outcome variable from pre- to post-MBSR. Using the Bonferroni approach to control for type 1 error across the 36 correlations, a p value of OHVV WKDQ ZDV UHTXLUHG I

The results of the correlation analyses revealed VHYHUDO VWDWLVWLFDOO\ VLJQL ble III). Most notably, increases in mindfulness scores were related to reductions in stress ($p < 0.0001$), depression ($p < 0.0001$), and emotional coping ($p < 0.0001$) and to increases in total sense of coherence ($p < 0.0001$).

Hierarchical regression was then performed to predict the main outcome (PSS change score) using 2 process variables. As shown in Table IV, the results of the hierarchical linear regression analyses, with age and time since completion of treatment forced into the model as covariates, revealed that neither of these potential confounders predicted a reduction in stress: $F_{2,56} = 0.814$, $p = 0.449$. However, when, in the next step, the model included the MAAS change score and the SOC total change score, the model reached VLJQL¿FDQFH DFFRXQWLQJ IRU variance in the prediction of the change in stress: $F_{4,56} = 11.858$, $p < 0.0001$.

4. DISCUSSION

$V RFFXUUHG LQ VWXGLHV SHUWD MBSR for patients with other types of chronic illness[32],

TABLE II Impact of the Mindfulness-Based Stress Reduction program on outcome and process measures ($n = 57$)

Variable	Mean score Pre-program	Mean score Post-program	Difference	d Value	t Value	p Value
Outcome measures						
Depression	16.30±9.91	10.26±7.56	6.04	0.57	4.25	0.0001
Perceived stress	17.95±6.05	14.07±6.17	3.88	0.64	4.83	0.0001
Medical symptoms	19.77±12.08	11.96±7.99	7.80	0.77	5.46	0.0001
Process measures						
Mindful awareness	3.91±0.82	4.35±0.68	0.44	–0.77	–5.59	0.0001
Distraction coping	26.23±5.49	28.25±5.75	2.02	–0.47	–3.51	0.001
Palliative coping	23.72±4.39	24.25±3.94	0.53	–0.14	–1.08	0.286
Instrumental coping	33.68±5.07	33.21±5.67	0.47	0.13	1.00	0.320
Emotional coping	22.91±7.07	19.84±6.66	3.07	0.54	4.07	0.0001
Comprehensibility	42.74±8.89	46.67±6.80	3.93	–0.54	–3.96	0.0001
Manageability	47.89±7.80	49.67±6.19	1.77	–0.27	–1.96	0.055
Meaningfulness	42.93±7.32	46.18±6.72	3.25	–0.62	–4.62	0.0001
Sense of coherence (total)	133.56±19.61	142.51±15.08	8.95	–0.52	–4.51	0.0001

%RQIHUURQL FRUUHFWLRQ 2 Tm (0.0001)Tj ET EMC /Span <0046csEFFv020628 87.3859 ,

patients discharged from medical treatment, may seem to be the large and small waves of their transformed lives.

5.

31. Carlson LE, Brown KW. Validation of the Mindful Attention Awareness Scale in a cancer population. J Psychosom Res 2005;58:29–33.
32. Carmody J, Baer RA. Relationships between mindfulness practice and levels of mindfulness, medical and psychological symptoms and well-being in a mindfulness-based stress-reduction program. J Behav Med 2008;31:23–33.
33. Witek–Janusek L, Alburquerque K, Chroniak KR, Chroniak C, Durazo–Arvizu R, Mathews HL. Effect of Mindfulness-Based Stress Reduction on immune function, quality of life and coping in women newly diagnosed with early stage breast cancer. Brain Behav Immun 2008;22:969–81.
34. Shapiro SL, Bootzin RR, Figueredo AJ, Lopez AM, Schwartz *(7KH HI¿FDF\ RI 0LQGIXOQHVV %DVHG 6WUHVV 5HGXFWLRQ LQ WKH treatment of sleep disturbance in women with breast cancer: an exploratory study. J Psychosom Res 2003;54:85–91.
35. Weissbecker I, Salmon P, Studts JL, Floyd AR, Dedert EA, Sephton SE. Mindfulness-Based Stress Reduction and sense RI FRKHUHQFH DPRQJ ZRP J Clin Psychol Med Settings 2002;9:297–307.
36. Geyer S. Some conceptual considerations on the sense of coherence. Soc Sci Med 1997;44:1771–9.
37. Schneider U, Büchi S, Sensky T, Klaghofer R. Antonovsky's sense of coherence: trait or state? Psychother Psychosom 2000;69:296–302.
38. Garland EL. The meaning of mindfulness: a second-order cybernetics of stress, metacognition, and coping. Complement Health Pract Rev 2007;12:15–30.
39. Segal ZV, Williams JMG, Teasdale, JD. Mindfulness-Based Cognitive Therapy for Depression. New York: The Guilford Press; 2002.
40. Fresco DM, Segal ZV, Buis T, Kennedy S. Relationship of posttreatment decentering and cognitive reactivity to relapse in major depression. J Consult Clin Psychol 2007;75:447–55.
41. Grossman P, Tiefenthaler–Gilmer U, Raysz A, Kesper U. Mindfulness training as an intervention for fibromyalgia: evidence of postintervention and 3-year follow-up benefits in well-being. IXOQHVV WUDLQLQJ DV DQ LQWHUYHQWLRQ SRVWLQWHUYHQWLRQ DQG \HDU IROORZ Psychother Psychosom 2007;76:226–33.
42. Tacón AM, Caldera YM, Ronaghan C. Mindfulness, psychosocial factors, and breast cancer. J Cancer Pain Symptom Palliation 2005;1:45–53.

Corresponding author: Patricia L. Dobkin, McGill Programs in Whole Person Care, McGill University, *HUDOG %URQIPDQ &HQWUH 3LQH $YHQXH West, Montreal, Quebec H2W 1S6.
E-mail: patricia.dobkin@mcgill.ca.

* Programs in Whole Person Care, McGill University, Department of Medicine, Montreal, QC.