Mindfulness-based cognitive therapy: an efficacious community-based group intervention for depression and anxiety in a sample of cancer patients

Greg R Sharplin, Simeon B W Jones, Barbara Hancock, Vikki E Knott, Jacqueline A Bowden and Hayley S Whitford

ABSTRACT

Objective: To assess the impact of an 8-week structured mindfulness-based cognitive therapy (MBCT) program on individuals experiencing distress as a consequence of cancer.

Design, setting and participants: Prospective study of 16 participants with a history of cancer and five carers of people with cancer recruited from August 2008 to February 2009 through calls to the Cancer Council South Australia Helpline. Participants were assessed for anxiety and depression before and after undergoing a course in MBCT between 30 September and18 November 2008 and 20 February and 10 April 2009.

Main outcome measures: Depression, anxiety and mindfulness as measured by the Beck Depression Inventory-II (BDI-II), State–Trait Anxiety Inventory (STAI), and Freiburg Mindfulness Inventory (FMI), respectively, and a consumer-centred evaluation.

Results: There were significant reductions in depression ($F[1,24] = 6.37$; $P = 0.012$; partial-$\eta^2 = 0.27$) and anxiety ($F[2,34] = 9.43$; $P = 0.001$, partial-$\eta^2 = 0.36$) and mindfulness ($F[2,32] = 8.36$; $P = 0.001$; partial-$\eta^2 = 0.34$) following the intervention, and these effects were sustained at the 3-month follow-up. Reliable change indices further support these findings. Participants' scores on measures of depression and anxiety decreased as a function of increased mindfulness, as reflected by significant ($P < 0.05$) negative correlations between FMI scores and BDI-II scores (ranging from $r = -0.46$ to $r = -0.79$) and STAI scores (ranging from $r = -0.46$ to $r = -0.50$) scores at all time points.

Conclusion: The MBCT program appears to be an efficacious intervention for use among people affected by cancer who also experience symptoms of depression and anxiety.

MJA 2010; 193: S79–S82

Optimal care of cancer patients incorporates effective psychosocial support.[1] There is considerable evidence suggesting that people affected by cancer suffer from substantial long-term psychological distress.[2,3] Indeed, the prevalence of symptoms of distress in cancer patients has been estimated to be in the 35%–45% range,[4,5] and is now considered the sixth vital sign.[6] As survival rates continue to improve, there is an increased need to provide effective support and intervention for people affected by cancer at all stages of the cancer journey.[6]

Group interventions offer many advantages over individual interventions, including improved cost-effectiveness along with the benefit of social and peer support.[7] They have also been shown to be as efficacious as individual interventions.[8] Mindfulness-based interventions are contemporary examples of group interventions that are demonstrating their clinical efficacy and receiving burgeoning attention in the literature.[9]

Mindfulness, defined as bringing one's attention to the experiences occurring in the present moment, in a non-judgemental or accepting way, consists of a number of facets including non-reactivity, observational awareness, acting with awareness and concentration, describing, and a non-judgemental attitude towards an experience.[10]

Originally developed as a program for people experiencing chronic pain and stress-related disorders, mindfulness-based stress reduction (MBSR)[11] is now the most frequently cited intervention with demonstrable effects for a variety of chronic conditions including cancer.[9,12]

Mindfulness-based cognitive therapy (MBCT),[13] as an efficacious treatment to prevent relapse in chronically depressive patients, is based on the MBSR program. MBCT integrates elements of cognitive therapy that promote a "decentred" relationship with one's thoughts. Research supports the use of MBSR in many applications,[14,15] but, to date, less is known about the efficacy of MBCT in the cancer setting.

In this article, we report on the evaluation of an MBCT program conducted at Cancer Council South Australia (CCSA) between 30 September and 18 November 2008 and between 20 February and 10 April 2009 (results from both groups were combined). Specifically, we seek to address the impact of such a program on depression and anxiety in people affected by cancer, and this report incorporates consumer feedback.

METHODS

Participants were recruited for the study from 20 June 2008 to 12 February 2009 through calls to the CCSA Helpline. Participants were: (i) informed of the program after contacting the CCSA Helpline for information and/or support; and (ii) referred to the CCSA Helpline for further information by means of flyers placed in primary care facilities or distributed through cancer support group leaders in the Adelaide metropolitan region. Participation was open to people with a history of cancer and carers of people with cancer.

The MBCT program facilitator completed a screening interview by telephone to exclude people with severe psychiatric disorders and substance misuse — potential participants were asked if they were currently receiving treatment for a psychological disorder and further questions probed for information concerning the use of substances. Participants were sent an information sheet, consent form and questionnaire, which they submitted in person before commencing the first MBCT session.

Ethics approval was granted by Cancer Council South Australia's Human Research Ethics Committee.

Demographic characteristics recorded included age, sex, highest level of education, marital status, type of cancer and time since diagnosis (where applicable).

Depression and state anxiety (a transitory emotional state that is characterised by subjective, consciously perceived feelings of tension and apprehension and heightened autonomic nervous system activity[16]) levels were assessed using the Beck Depression Inventory — second edition (BDI-II)[17] and Form Y-1 of the State–Trait Anxiety Inven-

tory (STAI).[16] Both measures have demonstrated reliability and validity in clinical and research settings.[16-19] Clinical ranges for the BDI-II are: 0–13, minimal depression; 14–19, mild depression; 20–28, moderate depression; and 29–63, severe depression.[17] Clinical ranges for the STAI are: 20–39, non-clinical anxiety; and 40–80, clinical anxiety.[16]

Mindfulness was measured using the short form of the Freiburg Mindfulness Inventory (FMI).[20]

Consumer-centred evaluation was achieved through open-ended questions that sought feedback about participants' perceptions of the program (eg, positive and/or negative effects, relevance to the cancer experience, ease with which mindfulness was incorporated into daily living, barriers to implementation).

The MBCT program comprised eight weekly 2-hour sessions:

- stepping out of automatic pilot;
- dealing with barriers;
- mindfulness of one's breath;
- staying present;
- acceptance, holding, allowing, letting be;
- thoughts are not facts;
- how can I best take care of myself?; and
- using what you have learned to deal with future mood.[14]

Participants attended one of two identical MBCT programs conducted at CCSA and facilitated by an experienced counsellor trained in MBCT. An optional 3-hour follow-up session was conducted 6 weeks after the end of each program to reinforce principles underpinning mindfulness practice.

Participants were provided with homework comprising notes and compact discs containing instructions to complete:

- body scan and mindfulness of breath;
- mindful movement and extended sitting meditation; and
- mountain and lake meditations (guided visualisations which use the image of mountain if seated, or lake if lying down, to explore the ability to remain steady in spite of the changing "weather" or seasons of life[11]).

Participants were encouraged to practise 45 minutes of mindfulness-based exercise 6 out of 7 days per week in order to facilitate integration of mindfulness principles into their lives and to record the time that they spent on these exercises in the homework diary provided.

A pretreatment questionnaire, comprising all key study variables, was posted to participants and had to be completed and handed to the facilitator before commencement of the first session. At two time points after completion of the intervention (1 week and 3 months), participants were sent a questionnaire that covered (i) all key study variables and (ii) consumer-centred evaluation. To maximise response rate, the MBCT facilitator followed up with participants who had not yet returned their questionnaire.

Statistical analysis

Repeated measures analyses of variance were used to assess whether depression, anxiety and mindfulness levels were significantly affected by the MBCT intervention over time.

For those measures with minimal missing data, values were calculated based on the recommendations of the respective test manual.[16,17] Data were analysed using SPSS, Version 17.0 (SPSS Inc, Chicago, Ill, USA).

RESULTS

The two MBCT programs were attended by 25 participants (13 in the first program and 12 in the second). Six participants attending the first program and eight attending the second also attended the optional 3-hour follow-up session 6 weeks later. Of the 25 participants who commenced the program, 22 were women and three were men, and their ages ranged from 34 to 69 years (mean age, 51.36 years; SD, 10.26). Three of these withdrew before completion, and one did not complete the postintervention and 3-month follow-up questionnaires. Thus, the following analyses include data for 21 participants (18 women, three men), aged 34 to 69 years (mean age, 52.0 years; SD, 10.2). These participants included 16 with a history of cancer and five carers. Eight of those with cancer had breast cancer. Other participants with cancer reported the following cancer types: glioblastoma multiforme; adenoid cystic carcinoma; acute myeloid leukaemia; lymphoma; liver cancer; bladder cancer; ovarian cancer; and prostate cancer. Time since diagnosis ranged from approximately 3 months to 120 months (mean, 30.88 months; SD, 32.09).

Of our 21 participants, 11 had completed secondary school and 10 had completed some form of tertiary education. Seventeen participants were currently married or in a de-facto relationship, two participants were single and two were either separated or divorced. One participant self-identified as having depression and was currently seeing a psychiatrist.

Preliminary analyses revealed no significant differences between the baseline scores of patients and carers on our outcome measures ($t = < 1$ for the BDI, STAI and FMI), so data from both MBCT programs were combined for further analyses.

Three participants had extensive missing data at only one time point (one at postintervention and two at 3-month follow-

1 Repeated measures analysis of variance and corresponding mean differences between preintervention scores and postintervention and 3-month follow-up scores for the Beck Depression Inventory — second edition (BDI-II), the State–Trait Anxiety Inventory (STAI) and the Freiburg Mindfulness Inventory (FMI)

	Preintervention					
Outcome measure	*F*	*df*	*P*	Partial-η^2*	Mean difference	95% CI
BDI-II ($n = 18$)						
Postintervention	6.37†	1,24†	0.012	0.27	−4.64	−7.36 to −1.93
3-month follow-up					−4.67	−8.76 to −0.58
STAI ($n = 18$)						
Postintervention	9.43	2,34	0.001	0.36	−11.78	−16.42 to −7.14
3-month follow-up					−7.22	−13.76 to −0.69
FMI ($n = 17$)						
Postintervention	8.36	2,32	0.001	0.34	5.35	1.40 to 9.31
3-month follow-up					6.85	3.00 to 10.71

* Measure of effect size. † Mauchly's test of sphericity was significant: *F*-statistic and corresponding degrees of freedom (*df*) based on Greenhouse–Geisser correction (epsilon, 0.695). ◆

2 Freiburg Mindfulness Inventory (FMI) scores correlated against Beck Depression Inventory — second edition (BDI-II) and State–Trait Anxiety Inventory (STAI) scores at preintervention, postintervention and 3-month follow-up

		BDI-II scores		STAI scores	
		Correlation coefficient (*r*)	*P*	Correlation coefficient (*r*)	*P*
FMI scores	Preintervention	−0.63	0.002	−0.49	0.024
	Postintervention	−0.79	< 0.001	−0.46	0.048
	3-month follow-up	−0.46	0.048	−0.50	0.029

up). Such missing data were excluded from all relevant analyses.

Impact of the MBCT program

Repeated measures analyses of variance showed that there were significant improvements in participants' depression, anxiety and mindfulness levels from preintervention to postintervention (Box 1). This corresponded to a clinical change in mean depression levels from mild (mean, 15.02; SD, 9.07) to minimal (mean, 10.37; SD, 5.92) and for anxiety levels from clinical (mean, 43.17; SD, 13.25) to non-clinical (mean, 31.39; SD, 9.61).

These levels were maintained up until the 3-month follow-up assessment for depression (mean, 10.35; SD, 7.35). There was a slight, but non-significant increase in mean anxiety levels at the 3-month follow-up (mean, 35.94; SD, 11.85) compared with the immediate posttreatment levels.

Mindfulness and therapeutic benefit

To evaluate whether mindfulness levels were related to levels of depression and anxiety, FMI scores were correlated against BDI-II and STAI scores at each respective time point (Box 2). There were significant negative correlations at each of the time points, suggesting that increases in mindfulness levels were associated with decreased levels of depression and anxiety.

Reliable and clinically significant changes in depression and anxiety

Reliable change indices were used to assess changes in scores for individual participants.[21] Box 3 suggests that MBCT was effective in reducing anxiety for participants irrespective of the clinical classification of their anxiety (ie, clinical versus non-clinical). MBCT was more effective in reducing depression in participants who had scores indicative of moderate or severe depression. STAI levels for two participants had increased at the 3-month follow-up, suggesting that MBCT may not have a sustained effect on state anxiety.

Consumer-centred evaluation

Nineteen participants noted that the peer group setting was very important for establishing a relaxed, non-judgemental and open-communication environment. There were exceptions, however, with some participants indicating a lack of willingness to disclose personal information (two participants) and/or feeling that others disclosed too much (two participants). One participant noted a lack of connectedness with the course emphasis on "depression".

Particular MBCT principles that were reported by participants to have been easily incorporated into their everyday lives were: living in the moment (six participants), changing destructive thought patterns (five participants), the ability to let go (five participants), and acceptance and trust (three participants).

Participants' perceptions of the length of the course were mixed (15 thought it was a suitable length; three thought it was too short; and two thought it was too long), yet attitudes towards the optional 3-hour follow-up session at 6 weeks were affirmative for the 14 who attended; these participants commented that they were able to: consolidate and reinforce what they learned during the intervention (five participants); socialise again with others in the group (seven participants); and receive reassurance that the intervention has a benefit in everyday life (three participants).

DISCUSSION

Our findings indicate that the MBCT program had a positive and sustained effect in reducing self-reported levels of depression and anxiety. Importantly, these benefits were linked with increases in mindfulness across each stage of assessment.

Depression and anxiety levels were significantly lower after the intervention, and these low levels were sustained 3 months after completing the MBCT program. These results are consistent with previous research applying MBCT to depression,[22] and support its efficacy in people affected by cancer. Furthermore, reliable change indices indicated that MBCT is effective at reducing all levels of anxiety; however, as an efficacious intervention for depression, it may be more

3 Reliable change indices from preintervention to postintervention and from preintervention to 3-month follow-up for depression and anxiety*

	Beck Depression Inventory — second edition						State–Trait Anxiety Inventory			
	Preintervention to postintervention (*n* = 20)†			Preintervention to 3-month follow-up (*n* = 19)†			Preintervention to postintervention (*n* = 20)		Preintervention to 3-month follow-up (*n* = 19)	
Change	Mild	Moderate	Severe	Mild	Moderate	Severe	Non-clinical	Clinical	Non-clinical	Clinical
Reliable positive change	1	2	3	1	0	2	5	7	4	4
Reliable negative change	0	0	0	0	0	0	0	0	1	1
No reliable change	5	1	0	5	3	0	5	3	5	4

* Values indicate the number of individuals who experienced a reliable positive, reliable negative or no reliable change in postintervention and 3-month follow-up scores based on their baseline scores. Participants grouped by preintervention clinical classification for depression and anxiety.[16,17]
† Minimal depression for the Beck Depression Inventory — second edition is not included, as all eight participants in this category experienced no reliable change and remained in the minimal range. ◆

valuable for people with moderate to severe levels of depression. Although, feedback from participants indicated that even those with lower levels of distress found participation in the program invaluable.

There was a slight rebound in anxiety levels at the 3-month assessment. Reliable change indices identified two participants whose anxiety levels had increased from baseline; further investigation of demographic data did not reveal a common characteristic between these two participants. Reasons for this adverse outcome are unknown and so may be unrelated to the program. Responses to the consumer-centred evaluation underscored the value of the follow-up session and future applications may include additional or ongoing "booster" sessions.

In line with previous qualitative research,[22] participants perceived MBCT as beneficial. Feedback revealed that it was the inclusion of principles of mindfulness in one's life that provided the most benefit. However, not all components of the course were without criticism (eg, its emphasis on depression), suggesting that some participants do not relate to the term "depression".

The group setting was considered important. Research suggests that people affected by cancer prefer to discuss issues with peers rather than with a general practitioner or psychologist.[23] Therefore, there still remains the challenge of determining whether it is the adoption of mindfulness practice or the peer support gained during the delivery of the MBCT program that contributes most to therapeutic outcome.

Moreover, there is still debate about how best to define and measure the concept of mindfulness.[10,20] Although research supports the psychometric properties of available scales,[19] it is not yet clear to what extent these measures are capturing the cognitive elements proposed in the MBCT program. Thus, the extent to which MBCT is superior to MBSR is as yet unknown.

Our study has a number of limitations. Firstly, it lacked a control group. Nevertheless, the systematic variation in mindfulness scores alongside changes in distress levels suggests that engagement with mindfulness practice leads to improved therapeutic outcome. Secondly, few carers participated in this study so the results may not be generalisable to carers. Similarly, the study sample was recruited essentially by opportunity, and thus results may not be applicable to all cancer types or stages in the cancer journey. Finally, further research should include provision for recording the amount of homework performed by participants, as ongoing practice is featured as a central requirement in the delivery of MBCT interventions.

Overall, this study provides preliminary support for the use of MBCT as an effective psychosocial intervention for people affected by cancer.

ACKNOWLEDGEMENTS

We thank Elizabeth Foley for initial guidance, support and encouragement in the planning and implementation of the program, and Deborah Shaw for providing critical review and technical guidance with the production of the manuscript. We also thank Charles Spielberger, author of the State–Trait Anxiety Inventory (STAI), for allowing us to use the STAI free of charge.

COMPETING INTERESTS

None identified.

AUTHOR DETAILS

Greg R Sharplin, BHSc(Hons), BSc, Research and Evaluation Assistant[1]
Simeon B W Jones, BHSc(Hons), BA, Program Coordinator, Data Infrastructure[1]
Barbara Hancock, DipNurs, DipCouns&Comm, Counsellor[1]
Vikki E Knott, BA(Hons), PhD, Senior Project Officer,[1] and Visiting Research Fellow[2]
Jacqueline A Bowden, MPH, BA(Hons), Manager, Behavioural Research and Evaluation Unit[1]
Hayley S Whitford, PhD, Behavioural Research Officer,[3] and Visiting Research Fellow[2]
1 Cancer Council South Australia, Adelaide, SA.
2 University of Adelaide, Adelaide, SA.
3 Cancer Council Australia, Sydney, NSW.
Correspondence: **jbowden@cancersa.org.au**

REFERENCES

1 National Breast Cancer Centre and National Cancer Control Initiative. Clinical practice guidelines for the psychosocial care of adults with cancer. Sydney: National Breast Cancer Centre, 2003.
2 Hodges LJ, Humphris GM, Macfarlane G. A meta-analytic investigation of the relationship between the psychological distress of cancer patients and their carers. *Soc Sci Med* 2005; 60: 1-12.
3 Rehse B, Pukrop R. Effects of psychosocial interventions on quality of life in adult cancer patients: meta analysis of 37 published controlled outcome studies. *Patient Educ Couns* 2003; 50: 179-186.
4 Carlson LE, Bultz BD. Cancer distress screening: needs, models, and methods. *J Psychosom Res* 2003; 55: 403-409.
5 Zabora J, BrintzenhofeSzoc K, Jacobsen P, et al. A new psychosocial screening instrument for use with cancer patients. *Psychosomatics* 2001; 42: 241-246.
6 Bultz BD, Carlson LE. Emotional distress: the sixth vital sign of cancer care. *J Clin Oncol* 2005; 23: 6440-6441.
7 Bottomley A. Where are we now? Evaluating two decades of group interventions with adult cancer patients. *J Psychiatr Ment Health Nurs* 1997; 4: 251-265.
8 Fawzy IF, Fawzy NW, Wheeler JG. A post-hoc comparison of the efficiency of a psychoeducational intervention for melanoma patients delivered in group versus individual formats: an analysis of data from two studies. *Psychooncology* 1996; 5: 81-89.
9 Ledesma D, Kumano H. Mindfulness-based stress reduction and cancer: a meta-analysis. *Psychooncology* 2009; 18: 571-579.
10 Baer RA, Smith GT, Hopkins J, et al. Using self-report assessment methods to explore facets of mindfulness. *Assessment* 2006; 13: 27-45.
11 Kabat-Zinn J. Full catastrophe living: using the wisdom of your body and mind to face stress, pain and illness. New York: Delacorte Press, 1990.
12 Baer RA. Mindfulness training as a clinical intervention: a conceptual and empirical review. *Clin Psychol Sci Prac* 2003; 10: 125-143.
13 Teasdale JD, Segal ZV, Williams JMG. How does cognitive therapy prevent relapse and why should attentional control (mindfulness) training help? *Behav Res Ther* 1995; 33: 25-39.
14 Segal ZV, Williams JMG, Teasdale JD. Mindfulness-based cognitive therapy for depression: a new approach to preventing relapse. New York: The Guilford Press, 2002.
15 Shapiro SL, Carlson LE. The art and science of mindfulness: integrating mindfulness into psychology and the helping professions. Washington, DC: American Psychological Association, 2009.
16 Spielberger CD, Gorsuch RL, Lushene RE. Manual for the State-Trait Anxiety Inventory. Palo Alto, CA: Consulting Psychologists Press, 1970.
17 Beck AT, Steer RA, Brown GK. Manual for the Beck Depression Inventory-II. San Antonio, TX: Psychological Corporation, 1996.
18 Arnau RC, Meagher MW, Norris MP, et al. Psychometric evaluation of the Beck Depression Inventory-II with primary care medical patients. *Health Psychol* 2001; 20: 112-119.
19 Dozois DJA, Dobson KS, Ahnberg JL. A psychometric evaluation of the Beck Depression Inventory-II. *Psychol Assess* 1998; 10: 83-89.
20 Walach H, Buchheld N, Buttenmüller V, et al. Measuring mindfulness — the Freiburg Mindfulness Inventory (FMI). *Pers Individ Diff* 2006; 40: 1543-1555.
21 Evans C, Margison F, Barkham M. The contribution of reliable and clinically significant change methods to evidence-based mental health. *Evid Based Mental Health* 1998; 1: 70-72.
22 Finucane A, Mercer SW. An exploratory mixed methods study of the acceptability and effectiveness of mindfulness-based cognitive therapy for patients with active depression and anxiety in primary care. *BMC Psychiatry* 2006; 6: 14.
23 Steginga SK, Campbell A, Ferguson, M, et al. Socio-demographic, psychosocial and attitudinal predictors of help seeking after cancer diagnosis. *Psychooncology* 2008; 17: 997-1005.

(Received 3 Dec 2009, accepted 24 Mar 2010) ❑