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An investigation into the health benefits of mindfulness-based stress reduction (MBSR) for people living with a range of chronic physical illnesses in New Zealand

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Abstract

Aim To establish the efficacy of Mindfulness-based Stress Reduction (MBSR) for people with chronic health problems in managing symptoms and coping with their illness in an Aotearoa/New Zealand context.

Method Twenty-nine participants completed a wait-list control study. Physical and psychological health and well-being were measured before, after and 6 months after the 8-week training programme using a variety of internationally recognised screening tools.

Results Statistically significant improvements were demonstrated in almost all categories measured.

Conclusion MBSR demonstrated health benefits for chronic illness sufferers. An economical and effective adjunctive therapy for decreasing morbidity associated with chronic illness in New Zealand, MBSR provides both clinicians and patients with an additional option for the better management of chronic illness.

Mindfulness can be defined as bringing one's complete attention to the experiences occurring in the present moment, in a non-judgemental and accepting way.[1] The Mindfulness-based Stress Reduction (MBSR) programme was developed by Dr Jon Kabat-Zinn, a neuro-biologist within the Massachusetts Medical School in 1979.

His programme helps people with a range of physical illness not able to be managed effectively by medical treatment and is delivered across the English speaking world.[1] Other forms of Mindfulness-based approaches have been incorporated into the management of a range of psychiatric disorders. For example, Dialectical Behaviour Therapy is used for people with borderline personality disorder, Mindfulness-based Cognitive Behavioural Therapy for those with relapsing depression and Acceptance and Commitment Therapy for a diverse range of psychiatric conditions.[2,3,4]

A growing body of research evidence suggests that MBSR is effective in alleviating suffering and improving the ability to cope in relation to a broad range of chronic illnesses as indicated by MBSR study meta-analyses.[5,6] However no published research to date has demonstrated similar results in Aotearoa/New Zealand.

MBSR was first introduced in New Zealand in 2005 by Jim Carmody, a psychologist with the University of Massachusetts Medical School who trained 40 health professionals to offer MBSR courses. A Waikato based group of psychologists undertook MBSR research within New Zealand (as yet unpublished). Our research aimed to replicate the Waikato study however, our team was comprised of a female

nurse who was part of the 2005 training and a male counsellor with more than 20 years experience of mindfulness practice.

Method

Research question

Is MBSR training and practice effective (compared with waitlist controls) in reducing physical signs and symptoms and psychological distress associated with chronic health problems in a New Zealand study sample?

Research aims—To evaluate the effectiveness of MBSR training in a New Zealand population in: 1) reducing physical signs and symptoms; 2) producing positive change in relevant medical markers of disease; 3) increasing coping ability; and 4) decreasing psychological difficulties (e.g. depression, anxiety) associated with chronic illness.

Study design—This was a wait-list control study. Random assignment was used to allocate participants to either the first or second intervention groups.

MBSR research intervention

The MBSR course consisted of eight 2½ hour night classes over a period of 8 weeks with a full day semi-silent retreat on a Sunday between weeks 6 and 8. It was aligned with the curriculum of the MBSR courses presently taught through the University of Massachusetts Medical School.[7]

Participants were taught three principle mindfulness techniques: body scan meditation, sitting meditation and gentle yoga. In addition, they learnt about stress management, communication, healthy diet and lifestyle, coping with difficult emotions, and participated in a range of exercises. Participants were provided with a workbook and CDs to support their classroom learning and 45–60 minutes of home practice 6 days of the week.

Participants and recruitment

We aimed to recruit 40 participants with 20 people in each intervention group and used a variety of strategies including the DHB staff Intranet and staff meetings, letters to GPs and the media. Half of the participants were referred by GPs and half were self-referred.

Potential participants made phone contact and were triaged to ensure they met the entry criteria, knew what the MBSR training involved, and were available for either intervention group. Entry criteria were:

- Stable chronic health problem (such as irritable bowel syndrome; chronic fatigue syndrome, hypertension, cardiac problems; pain etc.)
- Outpatient (able to travel to the hospital venue)
- 20+ years old
- Good command of English language
- Willing to work co-operatively in a group setting
- Willing and physically able to participate in MBSR training and regular practice, and to keep MBSR practice records
- Prepared to complete measures of psychological and physical health.

Exclusion criteria were:

- Hearing, visual, and/or physical impairment or disability which would prevent full participation in MBSR training, regular practice, and/or keeping MBSR practice records
- Currently acutely physically or mentally ill
- Known to have a psychotic illness or personality disorder
- Drug and/or alcohol dependent
- Already has a regular meditation practice.

After a 3-month recruitment process (May–July 2008) researchers met for screening interviews with 37 potential participants. Thirty-six participants were then randomised (by staff not directly involved in the research) into the first or second intervention group.

Four people who consented to participate did not for a variety of reasons, leaving 32 to commence the training. One person withdrew from Group 1 and two people withdrew from Group 2 after commencement.

Measures—The two principal researchers conducted screening interviews and provided the MBSR course. In this role they administered the self-assessment screening tools which were then coded independently so that the researchers were blinded to the identity of the participants. Statistical analysis of the coded questionnaires was conducted by other members of EIT's research staff.

If more than 1 month had elapsed between initial screening and when the participant commenced their MBSR programme, the participant was re-screened prior to commencing training. This occurred for some in Group 1 and all in Group 2.

A range of seven measures were used to assess participant health and wellbeing prior to beginning the training, at the end of the 8-week training and 6 months after completion, mirroring the Waikato study and providing comparison with other MBSR studies internationally.[5,8–12]

- *Short Form 36 Health Survey (SF-36).* A 36 item self-report survey which assesses physical and mental health and any changes over time.
- *Depression Anxiety Stress Scales (DASS).* Focuses on self-report statements concerning depression, anxiety and stress experienced over the previous week.
- *Kentucky Inventory of Mindfulness Skills (KIMS).* Comprises a 39 item self-report inventory designed to measure the four facets of mindfulness: Accepting without Judgement, Acting with Awareness, Describing, and Observing.
- *Pain Visual Analogue Scale (VAS).* A simple one question tool in which participants rate the severity of their pain on average over the last week from 0 to 10.
- *Pain Catastrophising Scale (PCS).* This tool measures the degree to which participants dwell on, magnify or feel helpless about their pain e.g., 'catastrophising'.
- *Patient Global Impression of Change (PGIC).* A one question screen which asks participants to "rate the change in your quality of life over the last month".
- *Six-Month Follow-up Questionnaire.* This was developed by the Waikato researchers to evaluate aspects of the study which would otherwise have been missed.

Only the first five measures were used at the screening interview. All screening questionnaires and the PGIC scale were used after course completion and at the 6 month follow up while the 6-Month Follow-up Questionnaires were completed only at that time. Returned questionnaires were coded by administrative staff prior to data entry, so that researchers were blinded to participant identity.

Follow-up

Informal follow-up took place a month after course completion. Participants were invited back to a meeting 6 months after the end of the MBSR course.

Results

Demographic data—29 people completed the research and of these 21% were male and 79% female; the mean age was 51 and ranged from 33 to 67; most of the participants identified as being NZ European (93%) with only one participant being Maori and one being of Indian descent (3.6%).

Quantitative measures—All data was analysed collectively for both groups and then separately for each group. For brevity only combined group scores are presented here as the results for both groups were similar. Group 1's results were sometimes stronger than Group 2, but at baseline Group 1's morbidity tended to be slightly higher.

Depression Anxiety Stress Scale (DASS)—To test the effectiveness of the MBSR training paired T-tests were performed. Significant improvements (or score decrease) were observed in depression, anxiety and stress scores between baseline and post-training with no significant changes in scores occurring between post training and follow-up (Table 1).

Table 1. The effect of MBSR training on depression, anxiety and stress scores (a negative result indicates an improvement [or decrease] in the score)

Variable	Pair of scores (mean ± SE)[1]	Mean score difference	N	P-value[2]	
Depression	B (13.5 ± 2.22),PT(4.4 ± 1.01) PT(4.1 ± 1.00), FU(5.3 ± 1.35)	-9.1 ± 1.93 1.3 ± 1.30	25 27	<0.001 0.340	(0.002)
Anxiety	B (9.2 ± 1.16), PT(4.8 ± 0.80) PT(4.8 ± 0.80), FU(4.8 ± 0.82)	-4.4 ± 0.92 0.0 ± 0.87	28 28	<0.001 0.968	(0.001)
Stress	B (16.5 ± 2.00), PT(8.6 ± 1.08) PT(8.8 ± 1.11), FU(9.0 ± 1.20)	-7.9 ± 2.03 0.2 ± 1.15	28 27	0.001 0.873	(0.011)

[1]B: baseline score, PT: post training score, FU: follow-up score

[2]A conservative Bonferroni correction has been applied to each significant P value and the corrected P values are given in brackets.

On average, participants scored depression, anxiety and stress in the mild range prior to MBSR training. All three indicators fell into the normal range post-training with this level being maintained at 6 months.

Kentucky Inventory of Mindfulness Skills (KIMS)—Table 2 indicates significant increases in all scores between baseline and post-training. However if a Bonferroni correction is applied, the significant result is lost for `describing', 'acting with awareness' and 'non judging'. The latter two however, tend towards significance (P<0.100).

Table 2. The effect of MBSR training on scores for observation, describing, acting with awareness and non judging. A positive difference indicates an increase in the score over the time period indicated

Variable	Pair of scores (mean ± SE) [1]	Mean difference	N	P-value[2]	
Observe	B(39.1 ± 1.77), PT (46.0 ± 1.43)	7.0 ± 1.88	29	0.001	(0.018)
	PT (46.1 ± 1.43), FU (46.9 ± 1.11)	0.8 ± 1.32	29	0.537	
Describe	B(25.8 ± 1.23), PT (28.3 ± 1.15)	2.5 ± 0.97	29	0.015	(0.289)
	PT (28.3 ± 1.15), FU (29.9 ± 1.12)	1.6 ± 0.69	29	0.032	(0.608)
Act Aware	B(28.0 ± 1.25), PT (31.5 ± 1.14)	3.6 ± 1.12	29	0.004	(0.068)
	PT (31.5 ± 1.4), FU (30.6 ± 0.57)	-0.9 ± 1.31	29	0.499	
Non judge	B (25.7 ± 1.39), PT (30.5 ± 1.61)	4.8 ± 1.49	29	0.003	(0.062)
	PT (30.5 ± 1.61), FU (31.4 ± 1.56)	0.9 ± 1.40	29	0.526	

[1]B: baseline score, PT: post training score, FU: follow-up score

[2]A conservative Bonferroni correction has been applied to each significant P value and the corrected P values are given in brackets.

Scores indicate a significant increase in participants' ability to observe their experience with detachment, a critical component of being mindful. There is also improvement in participants' ability to respond to their experience in a non-judgmental way and to act with awareness rather than react in habitual ways.

Pain Visual Analogue Scale (VAS) & Pain Catastrophising Scale (PCS)—Scores indicate that overall, there were significant decreases for each of the variables between baseline and post-training all of which persisted once a conservative Bonferroni correction was applied (Table 3). No other significant differences were detected between post-training and follow-up.

Table 3. The effect of MBSR training for pain, rumination, magnification and helplessness scores. A negative result indicates a decrease in the score over the time period indicated

Variable	Pair of scores (mean ± SE) [1]	Mean difference	N	P-value[2]	
Pain	B (3.8 ± 0.50), PT(2.6 ± 0.47)	-1.2 ± 0.28	22	<0.001	(0.008)
	PT(2.5 ± 0.44), FU (2.6 ± 0.48)	0.1 ± 0.38	25	0.917	
Rumination	B (5.3 ± 0.82), PT(3.1 ± 0.67)	-2.2 ± 0.58	28	0.001	(0.014)
	PT(3.3 ± 0.66), FU (2.1 ± 0.46)	-1.2 ± 0.50	28	0.026	(0.500)
Magnification	B (3.8 ± 0.57), PT(2.1 ± 0.45)	-1.7 ± 0.45	28	0.001	(0.012)
	PT(2.1 ± 0.45), FU (2.0 ± 0.39)	-0.2 ± 0.40	28	0.658	
Helplessness	B (6.3 ± 1.13), PT(3.3 ± 0.71)	-3.0 ± 0.87	28	0.002	(0.035)
	PT(3.3 ± 0.71), FU (2.7 ± 0.74)	-0.6 ± 0.65	28	0.361	

[1]B: baseline score, PT: post training score, FU: follow-up score

[2]A conservative Bonferroni correction has been applied to each significant P value and the corrected P values are given in brackets.

Not all participants engaged in the study had medical conditions that were associated with physiological pain e.g. hypertension, post myocardial infarction, asthma, tinnitus

and were asked to comment from the perspective of overall discomfort in their lives. However, the majority of participants did have conditions which gave rise to physical pain e.g., fibromyalgia, arthritis, irritable bowel syndrome, post cerebral vascular accident, eczema, migraine headaches, cancer.

Overall, participants' experience of pain/discomfort lessened as a result of the MBSR training. The significant positive changes around rumination, magnification and helplessness indicate that participants were better able to manage pain. This may interrelate with positive improvements in psychological health.

Short Form 36 Health Survey (SF-36)—Scores for physical function, role physical, role emotional, social functioning, mental health, energy/vitality, pain, and general health were analysed. To test the effectiveness of the MBSR training paired T-tests were performed. Significant increases were observed for each of the variables between baseline and post-training but once the Bonferroni correction was applied for multiple comparisons the significant differences observed for role physical, role emotional and pain were lost (Table 4). No significant changes were detected between post-training and follow-up (Table 4)

Table 4. The effect of MBSR training for physical function, role physical, role emotional, social functioning, mental health, energy/vitality, pain, and general health. A positive difference indicates an increase in the score over the time period indicated

Variable	Pair of scores (mean ± SE) [1]	Mean difference	N	P-value[2]	
Physical Function	**B(72.0 ± 4.31),PT(79.1 ± 3.5)** **PT(78.1 ± 3.74), FU(81.3 ± 4.31)**	**7.1 ± 2.10** **3.2 ± 2.69**	29 26	0.002 0.235	(0.042)
Role Physical	**B(34.5 ± 6.8), PT(57.8 ± 7.56)** **PT(56.3 ± 7.67), FU(67.0 ± 7.82)**	**23.3 ± 7.54** **10.7 ± 7.76**	29 28	0.005 0.179	(0.085)
Role Emotional	**B(57.1 ± 8.20), PT(83.3 ± 6.3)** **PT(82.7 ± 6.50), FU(81.5 ± 6.25)**	**26.2 ± 8.97** **-1.2 ± 9.16**	28 27	0.007 0.894	(0.132)
Social Functioning	**B(51.7 ± 4.69), PT(76.6 ± 4.75)** **PT(76.2 ± 4.91), FU(79.8 ± 4.28)**	**24.9 ± 4.80** **3.6 ± 3.53**	29 28	<0.001 0.320	(<0.001)
Mental Health	**B(58.5 ± 3.87), PT(78.2 ± 2.11)** **PT(78.8 ± 2.11), FU(76.0 ± 2.6)**	**19.7 ± 3.51** **-2.8 ± 2.47**	27 26	<0.001 0.273	(<0.001)
Energy/ Vitality	**B(38.5 ± 3.77), PT(59.3 ± 3.25)** **PT (59.6 ± 3.28), FU(59.4 ± 3.77)**	**20.7 ± 3.55** **-0.2 ± 4.18**	27 27	<0.001 0.965	(<0.001)
Pain	**B(57.9 ± 5.21), PT(69.3 ± 4.54)** **PT(58.3 ± 5.38), FU(70.6 ± 4.54)**	**11.5 ± 3.99** **2.0 ± 4.71**	29 28	0.008 0.677	(0.114)
General Health	**B(46.7 ± 4.63), PT(61.8 ± 4.68)** **PT(61.8 ± 4.85), FU(63.7 ± 4.26)**	**15.1 ± 3.62** **1.9 ± 3.65**	29 28	<0.001 0.608	(0.005)

[1]B: baseline score, PT: post training score, FU: follow-up score

[2]A conservative Bonferroni correction has been applied to each significant P value and the corrected P values are given in brackets.

As a result of their MBSR training, participants' reported that their physical and social functioning had improved along with their mental health, energy and vitality, and overall general health. Their ability to function in their physical and emotional roles was less significant. Interestingly their pain as captured within the SF36 did not show

significant improvement though the VAS and PCS screens did indicate significant change had occurred.

Patient Global Impression of Change (PGIC)—The PGIC score, only applied at post MBSR training and at 6 month follow-up indicate that all participants thought their health had improved immediately after their training. At the 6 month follow-up 70% of participants' health had continued to improve (Table 5.1). These results are consistent with the two international meta-analyses.[5,6]

Table 5.1. Post-training and 6-month follow-up responses to the Global Impression of Change survey

Response	Post Training		Six-month follow-up	
	Frequency	Percent	Frequency	Percent
A little worse	0	0	3	10.3
No change	0	0	6	20.7
A little better	5	17.2	4	13.8
Better	11	37.9	9	31.0
Much better	13	44.8	7	24.1

Limitations of study—The study is limited by using only subjective participant data. Biological measures, such as salivary cortisol levels, other blood test results, blood pressure measurement etc. would have added a rich source of objective data, but was beyond the scope and budget of this study.

The participant group was small, with 29 participants completing all phases of the research. However, despite the small sample size, statistically significant results were evident.

Demographically the sample was not representative of the general New Zealand population and also has a higher proportion of female participants—80%. It may be that MBSR is more acceptable to women, or that women are more likely to engage in self-help activities than men.

Detailed qualitative data analysis is to be reported in the New Zealand Journal of Counselling.[13]

Conclusion

People with chronic physical health problems in New Zealand often receive sound evidence based medical treatment to help them with their symptoms and thus improve their quality and length of life.

This study demonstrates that motivated individuals can achieve even greater gains, perhaps lessening their need for medical intervention, through specific education aimed at helping them cope with their health problem/s, and improving self care and self efficacy.

Competing interests: None.

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