Efficacy of internet-delivered mindfulness for improving depression in caregivers of people with spinal cord injuries and chronic neuropathic pain; A randomized controlled feasibility trial

Abstract

Objectives: To explore the feasibility and efficacy of web-based mindfulness training for carers of people with spinal cord injury (SCI).

Design: Randomized controlled feasibility study with three-month follow-up.

Setting: Community setting.

Participants: Spouses/family caregivers of people with SCI and chronic neuropathic pain were recruited via the direct care team and advertisements. Participants were aged over 18 years (no upper age limit), with internet access for the duration of the study. Participants were randomly allocated to an eight-week online mindfulness training intervention (*N*=28), or to receive eight weeks of psychoeducational materials on SCI and chronic pain (*N*=27).

Interventions: An established web-based, mindfulness training course was delivered over eight weeks. Participants completed ten minute mindfulness practices, twice per day, six days per week, totaling 960 minutes. The control group received a weekly email with psychoeducational materials (based on the established elements) on SCI and pain, for eight weeks.

Main Outcome Measure: Depression severity.

Results: Mindfulness reduced depression severity more than psychoeducation at T2 (mean difference = -.891, 95% CI [-1.48, -.30]) and T3 (mean difference = -1.96, 95% CI [-2.94, -.97]). Mindfulness training also reduced anxiety at T2 (mean difference = -.888, 95% CI [-1.40, -.38]) and T3 (mean difference = -2.44, 95% CI [-3.20, -1.69]).

Conclusions: Results indicate that internet-delivered mindfulness training offers unique benefits, and is viable for caregivers of people with SCI and chronic neuropathic pain. Further work should explore the feasibility of combined education and mindfulness training incorporating both patient and caregiver, for optimum benefit.

Keywords: telemedicine, meditation, education, anxiety, quality of life

List of Abbreviations:

ANCOVA - Analysis of Covariance	QoL - Quality of Life
CBT – Cognitive Behaviour Therapy	RCT – Randomized Controlled Trial
MBIs – Mindfulness-based Interventions	SCI – Spinal Cord Injury

Introduction

Caregiver burden and distress is demonstrated in many populations living with neurological conditions such as spinal cord injury (SCI)[1]. Evidence suggests that chronic pain affects 60% of people with SCI[2], impeding physical function[3], quality of life[4] and engagement in daily activities like work[5]. By extension, this is likely to complicate care needs and dependence on caregivers. The unique nature of caregiving required after SCI, and additional complications like pain, may induce distress in those providing care[6], often to a greater degree compared with care recipients[1], highlighting the need to consider caregiver wellbeing alongside that of those with SCI.

In addition to the complex needs of people with SCI, caregivers have to manage their own losses associated with SCI[7], and changes in relationship dynamics and identities[8]. Assuming a caregiver role can represent an attempt to improve the quality of life (QoL) of the injured person, but is costly to the caregiver, whose own QoL deteriorates[9]. Pain is most commonly cited as affecting QoL in both caregiver and care recipient following SCI[10], with those with SCI and neuropathic pain reporting increased self-perceived burden and distress arising from the impact of their care needs on others[11], thus family relationships can become strained[12]. Addressing the unique needs of caregivers could provide benefits in terms of wellbeing for caregiver and care recipient.

The significance of caregiver health is emphasised by increasing studies worldwide reporting the difficulties faced by family members of those with SCI, and the impact these have on the person with SCI, highlighting a need to explore the efficacy of interventions for caregivers. Cognitive-behavioural interventions yield mixed results; a six-month intervention to reduce stress and improve SCI-specific knowledge found no improvement[13], whilst a four-week psychoeducational programme requiring attendance at 90-minute weekly sessions demonstrated significant improvements in QoL[14]. However, caregiving demands and commitments required to attend face-to-face courses, may act as barriers to engagement, and delivering interventions via the internet may be preferred. Shorter, more intensive interventions may, therefore, be warranted.

Literature surrounding psychological interventions has seen increasing interest in mindfulness-based interventions (MBIs). Mindfulness is the skill of present-moment awareness that encourages

acceptance, rather than changing thoughts and behaviours[15]. Practices of attending to internal and external experiences enhance awareness, and the ability to become an observer of one's thoughts[15]. Though benefits of mindfulness training are documented for depression, anxiety, and pain following SCI[16], no studies have explored the feasibility of MBIs for caregivers of people with SCI. However, web-delivered MBIs perform similarly to face-to-face interventions, evidencing large effect sizes in reductions in stress[17], comparable to studies employing face-to-face mindfulness[18], and higher than studies of face-to-face CBT[19]. Internet-delivered MBIs are therefore likely feasible and effective methods of supporting self-management, offering ways of overcoming barriers to engagement. Through arming caregivers with skills to cope with distress, resilience and QoL could be built in the dyad of caregiver and person with SCI.

Lynch & Calahan[1] conclude that there exists a lack of clarity surrounding interventions to improve wellbeing in SCI caregivers. The present study, therefore, aimed to examine the feasibility of internet-delivered mindfulness training, and its efficacy for reducing depression and anxiety, and improving QoL of caregivers of people with SCI. This paper presents results of data collected and analysed as part of a larger study exploring the feasibility of mindfulness training for people with SCI and neuropathic pain and their caregivers, with results of analysis of SCI data published elsewhere[16].

Methods

Design

A between-subjects, single-center RCT design was utilised. A 2 x 3 design was used, assessing the role of intervention (2 levels; mindfulness training or psychoeducational control group), on each outcome measure at each data collection point (3 levels; baseline, T1; post-intervention, T2; and three-month follow-up, T3).

Participants

Participants were recruited from (BLINDED FOR ANONYMITY) in addition to advertisements published in local media, and were spouses/family caregivers of a person with SCI who experienced neuropathic pain and had been injured for a period of at least one year (including traumatic and non-traumatic injuries). Inclusion criteria were: aged over 18 years of age (no upper age limit), sufficient understanding of English, able to access the internet for the duration of the study. Exclusion criteria included: significant cognitive impairment, mental illness or head injury that would prevent engagement in the study (e.g. impede understanding of instructions during guided meditations); insufficient understanding of English; and previous formal and informal practice of mindfulness.

Procedure

Members of the direct care team at BLINDED FOR ANONYMITY identified people with SCI who were then asked to identify a family member who provides them with assistance. Individuals expressing interest in the study were sent generic letters of invitation (i.e. intervention-neutral but informing them of enrollment onto a course to support caregivers of people with SCI, and the requirement of weekly engagement for eight weeks). Those interested in enrolling were screened for eligibility by the direct care team. Following this, informed consent and baseline data were obtained (T1). Participants were then randomized to either receive mindfulness training, or psychoeducational materials via independent, computerized block randomization. Participants were blinded to their intervention, remaining blinded of the alternative group until conclusion of the study. Participant information sheets specific to

interventions were provided following randomization, and participants were offered the opportunity to ask questions before commencement of the intervention. Participants engaged with their allocated intervention for eight weeks, after which outcome measures were assessed (T2; analysis was not blinded). After completion of assessments at three-month follow-up (T3), participants received debrief letters and were offered the opportunity to participate in the mindfulness course, or receive the psychoeducational materials, in accordance with their original group allocation.

Interventions

Breathworks offers a web-based, eight-week mindfulness training course, evidenced to reduce depression and chronic pain[15]. The online course delivered two pre-recorded, ten-minute audio-guided meditations each day (recorded by qualified and experienced mindfulness teachers), six days a week for eight weeks (a total of 960 minutes of practice). Participants were instructed to complete the course individually, at times and locations suitable to them. The course led participants through a progressive experiential exploration of mindfulness, including topics such as breath awareness, and integration of mindfulness in daily life[20]. Course content can be found in Table 1 (for further detail see Cusens et al.[20]). The web host (Mindfulness Center, Sweden) monitored participant engagement via a progress bar which indicated when meditations had been completed, notifying the authors when each participant had completed the course. Finally, upon completion of the course, participants received a certificate of completion and continued access to the course resources.

INSERT TABLE 1 HERE

Participants in the psychoeducation group received a weekly email for eight weeks, providing psychoeducational materials on SCI and chronic pain to enhance understanding of SCI-specific pain and associated care needs. This acted as an attention control offering minimal but potentially meaningful intervention. Participants were advised to read these materials at times and locations suitable for them. Based in established elements of pain management psychoeducation programmes, content detailed epidemiology of SCI and SCI-specific pain, current understanding of pain using the

biopsychosocial model, and the role of stress and mood in pain perception after SCI. Further topics included options for pain and psychological management (pharmacological and non-pharmacological), and sources of support.

Measures

Measures were administered before (T1) and after the programme (T2) and at three-month follow-up (T3) for both groups via encrypted, online survey software.

Demographics. Demographics included four questions pertaining to gender, employment, relationship status, and ethnicity.

The Hospital Anxiety and Depression Scale (HADS[21]). Higher scores indicate greater depression and anxiety symptom severity on this 14-item measure, with scores ranging from 0 to 21 on each domain. The HADS is a reliable measure of depression and anxiety symptom severity across clinical and nonclinical populations (Cronbach's alpha for HADS-A α = .83, for HADS-D α = .82[22]). Each subscale demonstrated strong reliability in the present study (HADS-A α = .97; HADS-D α = .97).

Quality of Life (WHOQoL-BREF[23]): This 26-item questionnaire utilizes a 5-point Likert scale to assess four domains of QoL: physical, psychological, social, and environmental. Summed scores range from 0-100 with greater scores indicating superior perceived QoL in that domain. Validity is demonstrated in UK samples (Cronbach's alpha between .55 and .87 across the four domains[24]). Reliability was also strong in the present study (α = .96).

Five Facet Mindfulness Questionnaire (FFMQ[25]): The FFMQ measures five factors representing mindfulness: observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. The FFMQ contains 39 items scored on five-point Likert scales from 1 (never/rarely true) to 5 (very often/always true). The facet of non-reactivity ranges from 7 to 35, whilst all other facet scores range from 8 to 40, making 195 the maximum score on the FFMQ. Higher scores indicate greater mindfulness. The FFMQ has strong psychometric characteristics, including good reliability (α = 0.72-0.92) for all facets[25].

Retention Rates

Retention rates were calculated via participant discontinuation and loss to follow-up at 3 months. Intervention compliance was described as completing all 960 minutes of mindfulness training, given the aim of the study; to explore the utility of regular engagement in mindfulness training.

Statistical Methods

Data were analysed using SPSS version 22. A sample size calculation was performed with G*Power for the primary outcome measure of depression severity; for a power of 80%, an effect size of .40 (Cohen's *d*, based on previous review of psychological interventions for people with SCI and caregivers[26]), two-tailed, with significance set at $p < .05$, a total sample of 52 was required.

Data were assessed for distribution normality and outliers. Demographic data is reported as means and standard deviations. Controlling for baseline scores on each outcome measure, multiple univariate analyses of covariance (ACNOVAs) were utilized in preference to multivariate analyses. Confidence intervals and effect sizes (partial eta squared; η^2_p) are reported.

Ethical Considerations

This study was approved by BLINDED FOR ANONYMITY (ref: 14/SC/1424), the local Research and Development office, and BLINDED. The trial is registered with an International Standard Randomized Controlled Trial Number (ISRCTN14165286).

All participants gave informed consent and were debriefed at completion of the study. Ongoing support was offered and all patient identifiable information and corresponding data files were stored separately on a password-protected computer at The Psychology Department at the University of BLINDED. All applicable institutional and governmental regulations concerning the ethical use of human volunteers were followed during the course of this research.

Results

A CONSORT flow diagram provides randomization information (Figure 1). Participants were recruited between April 2015 and March 2016. Of 69 assessed for eligibility, 55 were randomized across the two interventions. Intention-to-treat principles were followed; Little's test indicated that cases were missing at random ($X^2(24, N = 44) = 15.582, p = .900$), and for participants who provided data at T1 and T2, missing data points for T3 were imputed using fully conditional specification multiple imputation. As a result, 55 participants are included in analyses at T1, and 44 at T2 and T3.

Demographic Characteristics

There were 28 participants in the intervention group and 27 in the control group; 29 (52.7%) were male, and mean age was 44 years. Fifty-one percent of the sample were married, and 29% were cohabiting. Most participants were employed full- (54.5%) or part-time (32.7%). The majority of the sample were white British, Irish, or European (85.5%). Participant characteristics are in Table 2. Means and standard deviations for each outcome measure are detailed in Table 3. There were no significant differences between groups on any outcome measure at baseline.

INSERT TABLES 2 AND 3 HERE

Compliance Rate

The total period to screen and enrol the sample was 13 months. By T2, seven participants had discontinued the mindfulness training (13%), and four discontinued psychoeducation (7%); a total intervention compliance rate of 80%. Independent samples t-tests identified no baseline differences between those who discontinued and those who completed the interventions. Five participants allocated to mindfulness training (9%), and five allocated to psychoeducation (9%), were lost to follow-up at T3; a total retention rate of 62%. There were no differences between study completers and those lost to follow-up on baseline measures or demographic variables. No adverse events were reported.

Effect of the Intervention

Analysis of covariance (ANCOVA) was conducted for outcome measures with baseline scores set as covariates in each analysis (see Tables 4 and 5). At T2, significant group differences ($p < 0.05$, $\eta^2_p >$ .095) were found for severity of depression, anxiety, physical, psychological, and social QoL. Significant group differences (favouring mindfulness training) were also identified for subscales of the FFMQ, including observing, acting with awareness, non-judging, non-reactivity to inner experience, and the total FFMQ score. There were no significant differences at T2 for environmental QoL, nor for the FFMQ facet of describing.

At T3, group differences ($p < 0.05$, $\eta^2_p > .118$) persisted for severity of depression, and anxiety, as well as social QoL. Similarly, observing, acting with awareness, non-reactivity, non-judging, and total FFMQ scores demonstrated significant group differences.

INSERT TABLES 4 AND 5 HERE

Discussion

This is the first study exploring the utility of an eight-week, internet-delivered mindfulness training intervention for caregivers of people with SCI. Caregivers engaging with online mindfulness training reported significant improvements in severity of depression and anxiety symptoms, psychological and social QoL, with small-to-medium effect sizes demonstrated for all. Mindfulness training significantly improved all mindfulness facets (except describing) upon completion of the intervention, improvements that were sustained at follow-up. Further reductions in severity of depression and anxiety, and improvement in social QoL were noted at follow-up, demonstrating the utility of internet-delivered mindfulness training for improving wellbeing in caregivers. Improvements in depression, anxiety, and mindfulness reflect benefits observed for people with SCI[16], whilst improvements in QoL were unique to caregivers. For care recipients, the QoL impact of functional and sensory losses associated with SCI may not be alleviated through mindfulness training.

Improvements seen in severity of depression in the present study suggest there exists a relationship between increased mindfulness practice and reduced depression, supportive of previous work[16,27], which found that, in people with SCI, higher levels of mindfulness correlated with lower levels of depression. Mindfulness training likely initiated increased acceptance of experience and awareness of emotional and social resources at their disposal to control outcomes associated with caregiving demands. Evaluation of the face-to-face version of the course used in the present study found immediate improvements in measures of depression[20], suggesting that the online delivery does not compromise the intervention's efficacy. A broad evidence base demonstrates the efficacy of mindfulness training for reducing major depressive relapse[28]. It is unsurprising, therefore, that internet-delivered mindfulness training offers similar benefits as those seen in face-to-face courses for non-clinical populations (i.e. caregivers), with the additional benefit of reducing travel and time commitments. This validates extending mindfulness training beyond the patient and screening for psychological distress in caregivers, though longer-term follow-up is required. Time constraints were cited as a reason for dropping out, suggesting that there may have been some difficulty integrating regular mindfulness practice into daily life due to pre-existing caregiving burden. Future research

253 should therefore establish which aspects of mindfulness training are most valuable for this group and
254 develop brief interventions that are more readily integrated into daily life.

255 Reductions in anxiety were noted following mindfulness training, supportive of previous
256 work[29]. As anxiety is characterised by focus on potential threats coupled with an underestimation of the
257 ability to cope, improvements seen in the present study likely arose from the role of mindfulness in
258 interrupting automatic ruminative thinking directing behavioural responses, thus reducing the cognitive
259 components of anxiety[30] and offering opportunities to respond adaptively[31]. Improvements in
260 psychological and social QoL were demonstrably larger as a result of mindfulness training compared
261 to psychoeducation, which did not adopt a skills-based approach. Mindfulness promotes non-
262 judgemental observational skills, acceptance and compassion, factors likely to improve awareness of
263 personal responses to the stresses of caregiving[31], such as taking time for self-care. Mindfulness training
264 therefore likely initiated change through active skills development.

265 The results presented are based on a participant pool of even proportions of male and female
266 caregivers, reflective of changing social norms and the rising assumption of caregiving roles by males[32].
267 Evidence suggests that gender differences exist in emotion regulation, with mindfulness techniques
268 leading to greater improvements in anxiety[33] and mindfulness[34] for women. However, the effects noted
269 in the present study suggest that internet-delivered mindfulness is beneficial for both male and female
270 caregivers.

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272 **Study Limitations**

273 In SCI, the average age of caregivers is 53 years old[35], whilst the average age of caregivers in the present
274 study was lower (44 years). Younger caregivers display poorer strategies for dealing with mental health
275 issues[36], reporting higher rates of depression[37]. It would be beneficial to explore the effect of
276 mindfulness training on older caregivers, and older people with SCI, to establish the extent of
277 improvements. Similarly, some caregiver characteristics, such as time spent caregiving, were not
278 assessed. Future research should endeavour to tailor interventions to age- and caregiver-specific needs.

279 Other limitations include recruitment from a single centre, and focus upon caregivers of people
280 with chronic neuropathic pain arising from SCI, who may have different support needs (such as reduced

functional ability and social participation). Attrition rates may represent the active engagement required, which may act as a barrier to adherence[38], indicating a need for brief interventions to accommodate this. Finally, the psychoeducational content focused upon the individual with SCI, rather than specific needs/concerns of caregivers. This was a passive intervention that did not focus upon skills development, and it was not possible to monitor whether participants had read the information. Future work might develop interventions specific to the needs of caregivers and optimise participation in online interventions.

Conclusions

This study found that eight weeks of internet-delivered mindfulness training fostered improvements in depression, anxiety and aspects of QoL in caregivers of people with SCI. There is no single, easily implemented, consistently effective method for improving psychosocial outcomes, and a 'one size fits all' approach is likely to be ineffective. Caregiving presents diverse challenges for both caregiver and recipient; tailored interventions to meet specific needs of these dyads, and exploration of how interventions for caregiver and care-recipient relate, is warranted.

Other Information & Acknowledgments

This trial is registered with the ISRCTN, reference number ISRCTN14165286. The authors would like to express their thanks to BLINDED for provision of the course.

Table 1. Details on mindfulness course content.

Week	**Content**
1	The course began with an introductory video demonstrating navigation of the online server. The first week of the course started with three variants of the body scan, during which participants draw their attention to various areas of the body, moving awareness systematically through each area of the body, noticing actual sensations of the body in a precise and detailed manner, as opposed to attending to thoughts, ideas or fears about these sensations.
2	Breath awareness meditations were introduced, alongside a fourth variant of the body scan. Breath awareness meditations started with broad awareness of the bodily experience of breathing, becoming increasingly focused on more subtle aspects of breathing, such as sensations around the nostrils, and encouraged participants to notice when their attention wandered.
3	Mindful movement was introduced, accompanied by body scans. The mindful movement meditation requires that the participant engage in bodily movements in time with their natural pace of breathing. Participants were encouraged to bring awareness to their physical activity and to pace themselves in daily life.
4	Acceptance and self-compassion meditations were then introduced, with participants encouraged to treat themselves with the kindness that they would treat others with. Participants were encouraged to engage in self-care activities.
5	Participants were encouraged to use their senses seek out pleasant aspects of daily life, thus inspiring them to become more receptive to simple, enjoyable features of their life. Participants were also directed to take a break each hour to focus on something positive. Meditations focused on developing the capacity to notice pleasant aspects of their experience.
6	Cultivation of broad, kind, and confident awareness continued in week 6, with grasping onto pleasant features of life discouraged. Participants were encouraged to appreciate the depth and breadth of experience, both pleasant and unpleasant. In this, participants were directed to acknowledge experiences, and to respond, rather than react, in order to improve their ability to choose adaptive responses.
7	This week introduced meditations that encouraged a kind attitude of connectedness and shared experience to oneself, friends, and others, so as to enhance feelings of connectedness and empathic relating with humanity.

8	During the final week, participants were reminded of all they had been taught throughout the course. Self-compassion and kindness to others meditations were practiced for three days, followed by body scan and breath awareness meditations, which were practiced for the remaining three days. Participants were then presented with a downloadable certificate confirming their completion of 20 hours (960 minutes) of focused training.

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304 Table 2. Demographic and clinical characteristics for partners/caregivers.

		Mindfulness (N=28)		Psychoeducation (N=27)		Total (N=55)	
		M	*SD*	*M*	*SD*	*M*	*SD*
	Age	42.8	11.4	45.0	11.0	44.0	11.1
		N	*%*	*N*	*%*	*N*	*%*
Gender							
	Male	17	60.7	12	44.4	29	52.7
	Female	11	39.3	15	55.6	26	47.3
Marital status							
	Married	15	53.6	14	51.9	29	52.7
	Cohabiting	8	28.6	8	29.6	16	29.1
	Widowed	3	10.7	2	7.4	5	9.1
	Divorced	2	7.1	3	11.1	5	9.1
Employment							
status	Employed, full time	17	60.7	13	48.1	30	54.5
	Employed, part time	8	28.6	10	37.0	18	32.7
	Unemployed	1	3.6	4	14.8	5	9.1
	Retired	2	7.1	0	0.0	2	3.6
Ethnicity							
	White British	18	64.3	17	63.0	35	63.6
	White Irish	1	3.6	2	7.4	3	5.5
	White European	3	10.7	6	22.2	9	16.4
	Asian	0	0.0	1	3.7	1	1.8
	Bangladeshi	4	14.3	0	0.0	4	7.3
	Other	2	7.1	1	3.7	3	5.5

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307 Table 3. Self-report outcome measures for partners/caregivers: Means and standard deviations.

		Mindfulness			Psychoeducation		
		T1 (N = 28)	T2 (N = 21)	T3 (N = 21)	T1 (N = 27)	T2 (N = 23)	T3 (N = 23)
WHOQoL-BREF							
Physical	Mean	63.29	65.52	67.81	65.33	70.48	70.26
	SD	8.16	4.96	6.15	8.08	5.99	5.71
Psychological	Mean	66.29	68.43	67.97	63.19	65.22	65.35
	SD	6.43	4.61	5.71	7.21	5.57	2.94
Social	Mean	69.21	74.14	75.89	62.26	65.83	64.48
	SD	8.18	4.36	5.20	9.49	6.94	6.21
Environmental	Mean	64.04	66.38	68.50	62.85	64.39	66.61
	SD	6.53	4.18	6.41	5.01	4.82	3.98
HADS							
Depression	Mean	11.50	10.57	8.86	10.59	10.78	10.30
	SD	3.82	3.57	3.22	5.29	4.89	4.28
Anxiety	Mean	11.46	10.38	8.13	9.78	9.78	9.39
	SD	3.39	3.26	2.12	4.93	5.05	4.41
Mindfulness Total (FFMQ)	Mean	117.36	130.10	130.62	110.63	113.39	112.30
	SD	17.38	16.66	15.33	25.34	20.99	20.66
Observing	Mean	24.50	26.86	26.63	23.56	23.13	23.09
	SD	4.26	4.73	4.37	6.07	4.95	4.76
Describing	Mean	23.86	25.67	25.58	22.41	23.43	23.35
	SD	4.18	4.96	4.46	5.79	4.96	4.75
Acting with awareness	Mean	23.54	25.90	25.78	22.44	22.87	22.65
	SD	3.39	3.18	3.28	5.29	4.39	4.18
Non-judging	Mean	22.96	25.43	26.25	21.59	22.22	21.74

	SD	4.05	4.01	4.16	4.89	3.97	3.98
Non-reactivity	Mean	22.50	26.24	26.37	20.63	21.74	21.48
	SD	4.44	4.13	4.21	5.08	4.64	4.63

308 WHOQoL-BREF = World Health Organization Quality of Life Brief Scale. HADS = Hospital
309 Anxiety and Depression Scale. FFMQ = Five Facet Mindfulness Questionnaire.

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Table 4. Analysis of covariance for group effects at T2. (N = 44)

Measure	*F*	*p*-value	η^2_p	Mean Difference T2 (mindfulness – control)	95% CI (lower, upper)
WHOQoL-BREF					
Physical	7.71	.008*	.158	-4.22	-7.30, -1.15
Psychological	4.28	.045*	.095	2.33	.06, 4.60
Social	13.32	.001*	.245	5.49	2.45, 8.53
Environmental	.93	.342	.022	.79	-.87, 2.46
HADS					
Depression	9.37	.004*	.186	-.891	-1.48, -.30
Anxiety	12.51	.001*	.234	-.888	-1.40, -.38
FFMQ					
Total	37.72	.000*	.479	9.45	6.35, 12.56
Observing	15.03	.000*	.268	2.71	1.30, 4.12
Describing	1.42	.241	.033	.56	-.39, 1.50
Acting with Awareness	18.08	.000*	.306	1.98	1.04, 2.93
Non-judging	7.62	.009*	.157	1.90	.511, 3.29
Non-reactivity	26.56	.000*	.393	2.43	1.48, 3.38

* = $p < 0.05$

WHOQoL-BREF = World Health Organization Quality of Life Brief Scale. HADS = Hospital Anxiety and Depression Scale. PCS = Pain Catastrophising Scale. FFMQ = Five Facet Mindfulness Questionnaire.

Table 5. Analysis of covariance for group effects at T3. (N = 44)

Measure	*F*	*p*-value	η^2_p	Mean Difference T3 (mindfulness – control)	95% CI (lower, upper)
WHOQoL-BREF					
Physical	1.56	.325	.036	-1.68	-5.06, 1.69
Psychological	3.43	.113	.076	2.55	-.28, 5.378
Social	30.21	.000*	.424	9.77	6.17, 13.36
Environment	.73	.461	.018	1.14	-1.80, 4.07
HADS					
Depression	16.09	.000*	.281	-1.96	-2.94, -.97
Anxiety	43.09	.000*	.588	-2.44	-3.20, -1.69
FFMQ					
Total	55.56	.000*	.057	11.66	8.50, 14.82
Observing	15.59	.000*	.275	2.68	1.31, 4.05
Describing	2.35	.162	.054	.74	-.26, 1.74
Acting with Awareness	19.26	.000*	.318	2.13	1.15, 3.12
Non-judging	18.25	.000*	.307	3.32	1.75, 4.90
Non-reactivity	26.91	.000*	.395	2.92	1.78, 4.06

* = $p < 0.05$

WHOQoL-BREF = World Health Organization Quality of Life Brief Scale. HADS = Hospital Anxiety and Depression Scale. PCS = Pain Catastrophising Scale. FFMQ = Five Facet Mindfulness Questionnaire.

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