Investigating the role of beliefs about emotions, emotional suppression and distress within a pain management programme for fibromyalgia

British Journal of Pain
2019, Vol 13(2) 112–120
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DOI: 10.1177/2049463718820882
journals.sagepub.com/home/bjp

Hannah M Bowers¹ , Tamar Pincus¹, Gareth Jones² and Abigail L Wroe¹

Abstract

Introduction: This study aims to explore the relationships between beliefs about emotions, emotional suppression, distress and global impact (i.e. the extent to which a patient's symptoms impact their life) in a longitudinal design with patients who are taking part in a pain management programme.

Methods: A total of 40 participants with fibromyalgia took part in pain management programmes at multiple sites as part of their usual care in the National Health Service. Measures of beliefs about the unacceptability of experiencing and expressing emotions, emotional suppression, distress and global impact were completed before and after the programmes.

Results: Beliefs about emotions significantly reduced following treatment, but emotional suppression did not. Changes in beliefs about emotion correlated with changes in emotional suppression. Changes in distress were related to changes in suppression and the relationship between global impact and beliefs about emotions was approaching significance.

Conclusion: Emotional suppression and beliefs about emotions may play a role in the improvement in distress following treatment. However, future research should examine these variables as mediators of the effect of treatment compared to waitlist controls in a larger sample.

Keywords

Fibromyalgia, pain management, beliefs about emotions, distress

Introduction

Fibromyalgia is a condition consisting of widespread pain, fatigue and cognitive and sleep impairments.¹ There is extensive research aiming to understand the pathophysiology of the condition as well as the role of psychological factors. Biomedical explanations have argued that the disorder is caused by physiological impairments, such as reduced pressure pain thresholds as a result of central sensitisation and a dysfunction in endogenous pain inhibition.^{2,3} Biopsychosocial explanations, however, in addition to accounting for neurobiological triggers, acknowledge the important role of cognitions, behaviour and social interactions in maintaining symptoms of fibromyalgia.^{4,5}

A recent systematic review explored the role of emotion regulation in chronic pain and its relation to outcomes across 15 studies.⁶ Emotion regulation strategies were described as either antecedent-focused (i.e. strategies employed before the emotion is fully developed) or response-focused (i.e. strategies used in response to

¹Department of Psychology, Royal Holloway University of London, Egham, UK

²Frimley Health NHS Foundation Trust, Frimley, UK

Corresponding author:

Hannah M Bowers, Department of Psychology, Royal Holloway University of London, Egham Hill, Egham TW20 0EX, UK.
Email: Hannah.Bowers.2010@live.rhul.ac.uk

the experience of an emotion). Strategies such as avoiding situations and cognitive reappraisal are therefore antecedent-focused, while emotional suppression is response-focused.⁷ The review found that antecedent-focused strategies (such as cognitive reappraisal) are more adaptive than response-focused strategies (such as emotional suppression) in chronic pain. They argue that living with chronic pain results in increased emotional difficulties. These emotional difficulties may then make it more difficult to employ adaptive emotion regulation strategies.⁶ While few studies demonstrated a direct relationship between emotion regulation strategies and pain intensity and disability, there was evidence that emotion regulation is related to well-being, functioning, depression, anxiety and stress, suggesting an indirect relationship between emotion regulation and pain- and disability-related outcomes in chronic pain.⁶ The review therefore argues that emotion regulation could be a useful target in psychological therapies.

Research exploring beliefs about experiencing and expressing emotions has found indirect relationships between these beliefs and quality of life, distress and physical symptoms. In healthy participants, the relationships between beliefs about the unacceptability of emotions and fatigue, depression and anxiety were mediated by emotional avoidance and self-compassion.⁸ A cross-sectional study of 182 participants with fibromyalgia found that the relationship between beliefs about emotions and global impact (i.e. the extent to which a patient is impacted by their symptoms) was serially mediated by emotional suppression and distress.⁹ It was argued that believing it is unacceptable to express emotions would result in increased emotional suppression. Increased emotional suppression may then lead to an increase in distress through ironic processing effects.^{10,11} Ironic processing theory argues that attempts to suppress an emotion may result in an 'ironic' increase in that emotion due to failures of cognitive mechanisms to effectively suppress emotions when under high cognitive load (such as experiencing high levels of negative affect). The distress that results from attempts to suppress one's emotions may lead to further impact on their ability to live with the condition, as distress has consistently demonstrated a strong relationship with pain and disability.¹²

An uncontrolled trial of an intervention targeting emotional awareness, emotional expression and psychological attribution for individuals with musculoskeletal pain found that emotional awareness, emotional approach coping and alexithymia changed significantly following the intervention.¹³ While there were significant improvements in pain intensity and pain interference, relationships between changes in emotion processing and changes in outcomes were not explored.

Given that there was no comparison with other interventions, it is possible that emotion processing may also be affected in existing group therapies for fibromyalgia.

Previous research has demonstrated an association between beliefs about emotions and emotional expression in a cross-sectional study in a community sample of individuals with fibromyalgia.⁹ The aim of the current research is to investigate the association between beliefs about emotions, emotional suppression, distress and global impact of fibromyalgia over time. In order to measure relationships between changes in beliefs and behaviours around emotions and changes in distress and global impact in a longitudinal design, participants were patients taking part in pain management programmes. This was chosen because beliefs about emotions and emotional suppression would be expected to change through psychological intervention using second- and third-wave cognitive behavioural therapy (CBT) techniques; arguably, second- and third-wave CBT approaches involve the encouragement of sharing thoughts and feelings as part of the therapeutic relationship and therefore may elicit changes in emotional expression and in beliefs about the unacceptability of emotions. In particular, the interventions included in this study took an integrative approach and included work on acceptance of, and working with, pain and emotions. It is predicted that changes in beliefs about emotions and emotional suppression will be associated with improvements in distress and global impact. This study aims to generate new knowledge about the relationships between these variables within the context of treatment but does not aim to judge the quality of the service.¹⁴

Methods

Participants

A total of 71 participants were recruited from National Health Service (NHS) trusts in the South of England. Participants were patients referred to a pain management programme for people with fibromyalgia, as a routine part of their care. They were then invited to take part in the research by letter in advance of the first session of their pain management programme.

Participants were informed of their right to withdraw and that doing so would have no impact on their treatment with the service. This study received ethical approval from the university's psychology departmental ethics committee and from the NHS Research Ethics Committee (REC; ref: 14/WM/1003).

While 70 participants took part, due to low questionnaire response rates, only participants who completed the questionnaires at the first and second time

points (out of three possible time points) were included in this study resulting in a final sample of 40 participants. Response rates reflect those who did not complete the questionnaires and did not reflect programme attendance or treatment adherence.

Procedure

Participants were given a questionnaire pack by their therapist or a researcher before their first session of the intervention, at or after the final session of the intervention and then again 12 weeks after the intervention at a follow-up meeting, by post or online. Therapists were given flexibility with regard to the mode of collecting data for the second and third time point and with how they would contact patients who did not respond. Questionnaires completed at the third time point were excluded from analyses due to loss at follow-up resulting in too small a sample size ($n = 21$).

The questionnaire pack included an information sheet and consent form. Beliefs about the unacceptability of emotions, emotional suppression, distress and quality of life were also measured. Participants were asked demographic questions regarding sex, age, nationality, education level, employment status and ethnicity.

Measures

Beliefs about the unacceptability of experiencing and expressing emotions were measured using the Beliefs about Emotions Scale (BES).¹⁵ Participants rated on a 7-point scale their agreement with 12 items. High scores demonstrate more strongly believing that expressing and experiencing emotions is unacceptable, with a maximum possible score of 72. The measure has been validated in participants with chronic fatigue syndrome (CFS) and was found to be internally consistent (Cronbach's $\alpha = .91$).¹⁵

Emotional suppression was measured using the Courtauld Emotional Control Scale (CECS), which measures to what extent individuals control feelings of anger, sadness and anxiety.¹⁶ Agreement with 21 items (7 per emotion) is rated on a 4-point scale. Total scores result in a maximum possible score of 84, where high scores indicate more emotional suppression. The CECS has been found to be valid and reliable in patients with breast cancer (Cronbach's $\alpha = .88$).¹⁶ In patients with fibromyalgia, the scale has been found to have excellent internal consistency (Cronbach's $\alpha = .948$).¹⁷ This measure was selected as this study aimed to explore beliefs about emotions as a separate construct from behaviours around emotional expression. It was therefore necessary to use a scale where

items were focused solely on emotional suppression and not on beliefs about emotional suppression.

The Hospital Anxiety and Depression Scale (HADS)¹⁸ was used to measure distress. In total, 14 items ask participants to rate on varying 4-point scales their level of depression and anxiety symptoms. Seven items address each affect. This measure was selected as it has been used reliably to detect anxiety and depression in participants with physical symptoms due to its lack of reference to somatic features of depression and anxiety compared with other measures such as the Patient Health Questionnaire-9 and Beck Depression Inventory.^{19,20} Scores were summed across both depression and anxiety items to create one overall distress score with a maximum of 42 (Cronbach's $\alpha = .82-.90$).²⁰ Overall, HADS scores across the two subscales have been used in a range of samples including those in primary care²¹ and those with musculoskeletal pain²² and fibromyalgia.⁹

To measure outcomes specific to fibromyalgia, the revised Fibromyalgia Impact Questionnaire (FIQR) was used (Cronbach's $\alpha = .95$).²³ The questionnaire measures the impact of fibromyalgia across three domains: function, overall impact and symptoms. Items ask participants to respond on varying 11-point scales about their symptoms and functioning. Scores are summed and converted to scores out of 100 where high scores indicate greater impact of the disorder on the person's life.

Pain management programme

The setting for this research was pre- and post-measures around a pain management programme, which was offered as routine part of their standard care in NHS trusts in the South of England. The specific content of the programmes varied slightly across sites. The details of the psychological elements of the intervention were determined by the clinical psychologist using current evidence base. This allowed for evaluation of the variables of interest without evaluating the effectiveness of any particular element of the intervention.

Groups were run by a clinical psychologist and three groups were jointly run with a pain physiotherapist. Physiotherapy elements included mindful movement and chair-based movements. Programmes were conducted in a group setting using second- and third-wave CBT approaches. Two of the programmes were specific to fibromyalgia, while the other two groups were mixed groups of patients with a range of chronic pain conditions (only individuals with fibromyalgia were included in this study). The number of sessions ranged from six to nine and lasted between 2 and 3 hours. They were all conducted weekly. Group sizes ranged from 4 to 10. Details of each programme can be found in Table 1.

Table 1. Description of pain management programmes (PMP).

PMP	Approach	Group composition	n (Number who took part)	Number of sessions	Description
1	Integrative CBT/ACT/CFT/systemic	Group (fibromyalgia)	17 (23)	6 × 3 hours weekly	Joint run by clinical health psychologist and specialist pain physiotherapist Sessions covered 'Explain Pain' (how the body works regarding pain); coping strategies, shared understanding of difficulties and maintain cycles, fight/flight response; value/goals; acceptance; boom and bust; why we exercise; managing/evaluating thoughts; self-compassion; mindfulness; communication; sleep; and relapse prevention
2	Mindfulness-based cognitive therapy	Group (chronic pain)	8 (19)	10 × 2 hours weekly	Run by clinical psychologist following the Breathworks Mindfulness for health programme. ²⁴ Sessions covered increasing awareness of thoughts, sensations and behaviours; understanding primary and secondary suffering; acceptance; self-compassion; and mindful movement. Mindfulness exercises were completed in session and as homework
3	ACT	Group (fibromyalgia)	1 (7)	8 × 1 hour weekly	Run by a clinical psychologist, sessions covered understanding pain; the impact of mood and emotions on pain; the role of stress and how it can be managed; mindfulness, identifying and working towards values; and patients were given a hand-out of 'sit and fit' exercises to be conducted at home in between sessions
4	CBT	Group (fibromyalgia)	5 (12)	9 × 3 hours weekly	Joint run by physiotherapist and clinical psychologist. Sessions include the following: physiology of FM—reconceptualising pain, boom-bust and pacing, values and goal-setting, benefits of exercise, managing unhelpful thoughts, sleep, mindfulness, nurse-led medication information, flare-up planning, family and friends session and communication
5	CBT	Group (chronic pain)	9 (9)	9 × 2 hours weekly	Joint run by clinical health psychologist and specialist pain physiotherapist. Topics covered include the following: education about chronic pain, advice on exercise, pacing, emotional implications of living with chronic pain, value-driven goal-setting, managing distressing emotions and unhelpful thoughts, mindfulness, medication, family and friends session, sleep management and planning for flare-ups

ACT: acceptance and commitment therapy; CBT: cognitive behavioural therapy; CFT: compassion-focused therapy.

Table 2. Participant characteristics of the current sample.

	n	%
Sex (female)	37	92.5
In employment	17	44.5
UK National	34	85.0
Ethnicity		
White	33	82.5
Mixed race, White and Black African/Caribbean	2	5.0
Indian	1	5.0
African	1	2.5
Highest level of education		
Secondary school	12	30.0
Sixth form	18	45.0
University undergraduate	2	5.0
University post-graduate	6	15.0

Figure 1. Flow diagram of participation throughout the study.

All four programmes discussed goal-setting, values, activity pacing, education about pain and its associated neurophysiological processes, managing unhelpful thoughts, acceptance, mindfulness and advice on exercise and sleep. One group also covered communication and self-compassion. Another group had discussions about medication with a medical consultant in pain.

Design and analysis

This was a repeated measures longitudinal design. To test whether there were significant changes in beliefs about emotions and emotional suppression, *t* tests were used comparing scores before treatment with scores after treatment.

Change scores were calculated and correlations between variables were examined using Pearson's correlations. All tests were conducted in SPSS with *p* values below .05 considered statistically significant.

Results

Participant characteristics

Demographic information was analysed for the sample (mean age = 48.03, standard deviation (SD) = 11.305). Participant characteristics can be found in Table 2. Participants who took part were compared with participants who did not complete the second time point. There were no differences in any demographic features or measured variables. However, questionnaire non-completion did vary between the different programmes, with fewer participants completing questionnaires in groups 2 and 3 ($\chi^2 = 17.569$, $df=4$, $p = .001$; see Table 1). Participation and response to questionnaires are recorded in Figure 1.

Differences between pre- and post-intervention

BES scores were significantly lower after the intervention, $t(39) = 2.261$, $p = .029$ (i.e. the level of negative beliefs about expressing and experiencing emotions was reduced). Emotional suppression did not significantly change during the intervention, $t(37) = 1.527$, $p = .135$. Means and SDs can be found in Table 3. Effect sizes were small for all variables except the FIQR, which had a medium effect size.^{25,26} Effect sizes and confidence intervals were calculated as outlined by Morris and DeShon.²⁶ Although the change in FIQR was statistically significant, only one participant's change was clinically significant (based on the minimum clinically important difference (MCID) of 27.04).²⁷ There is no validated MCID available for the BES or CECS and the MCID for the HADS has not been calculated in patients with chronic pain.

Change scores were calculated for each of the variables. There were significant positive correlations between changes in emotional suppression and beliefs about emotions and distress. Changes in distress were also significantly related to changes in global impact and changes in emotional suppression, and the relationship between distress and beliefs about emotions was marginally significant (see Table 4). Correlations were significant, however, they were low, except the correlation between changes in distress and global impact which was moderate.²⁸

Discussion

Changes in beliefs about emotions and emotional suppression were significantly positively correlated which suggests that changes in beliefs around emotions may be associated with changes in behaviour in terms of emotional expression/suppression (though changes in emotional suppression were not significant in this

Table 3. Means and standard deviations before and after treatment.

	Before treatment		After treatment		Effect size
	Mean	SD	Mean	SD	d [95% CIs]
Beliefs about emotions* (BES scores)	44.74	15.99	39.31	15.84	-0.35 (-0.80, 0.09)
Emotional suppression (CECS scores)	58.64	12.74	56.66	14.98	-0.28 (-0.74, 0.19)
Distress* (HADS scores)	22.32	6.96	20.15	6.92	-0.42 (-0.86, 0.02)
Global impact* (FIQR scores)	68.56	14.03	63.19	16.05	-0.60 (-1.03, -0.12)

SD: standard deviation; BES: Beliefs about Emotions Scale; CECS: Courtauld Emotional Control Scale; HADS: Hospital Anxiety and Depression Scale; FIQR: Fibromyalgia Impact Questionnaire.

* $p < .050$.

Table 4. Pearson's correlation values and p values for correlations between change scores.

	Emotional suppression		Distress		Global impact	
	r	p	r	p	r	p
Beliefs about emotions	.378	.019*	.307	.054	.061	.714
Emotional suppression	-	-	-.334	.041*	.105	.538
Distress	-	-	-	-	.543	<.001*

* $p < .050$.

study). Changes in emotional suppression were also correlated positively with changes in distress. Changes in beliefs about emotions showed a trend which was approaching statistical significance, where changes in beliefs were marginally positively related to changes in distress. This is in line with Burger et al.¹³ who found that changes in emotional approach coping (i.e. understanding, validating, acknowledging and expressing one's emotions) were related to changes in psychological distress but not pain following an intervention aimed at addressing emotional awareness and coping. Interestingly, Burger et al. found that changes in emotional awareness and alexithymia were related to improvements in pain. Perhaps, future research should also measure emotional awareness and alexithymia in treatments for fibromyalgia as these may be directly related to changes in global impact, while beliefs about emotions and emotional suppression were not.

Changes in emotional suppression were positively related to changes in distress and changes in distress were positively related to changes in global impact. These correlational findings support the previous mediation model found cross-sectionally by Bowers et al., who found distress to be mediator of the

relationship between beliefs about emotions and global impact despite not finding a significant direct relationship between beliefs about emotions and global impact.⁹ Further support for this finding comes from a review of emotion regulation strategies in chronic pain. The authors argued that there is evidence that response-focused emotion regulation strategies (including emotional suppression) are related to pain outcomes via psychological factors including anxiety and low mood.⁶ However, this needs further exploration using mediation analyses in a longitudinal design. This study's low response rate meant that the sample size was insufficient for tests of mediation across the three time points.

There were significant reductions in beliefs about emotions but not emotional suppression after treatment. All groups discussed acceptance of unpleasant experiences (either physical pain or emotional experiences). It may be that there were significant changes in the beliefs around experiencing emotions, but not in beliefs about expressing emotions. The BES measures the unacceptability of both experiencing and expressing emotions, while the CECS measures expression. It may be useful in future to look at these two belief constructs separately. Alternatively, it may be that changes in beliefs occur initially and changes in emotional suppression occur later as has been suggested in other interventions for fibromyalgia.²⁹ It would be helpful in future research to obtain follow-up data in order to test whether the changes observed in this study are maintained after the intervention is complete and whether changes in emotional suppression may be delayed.

Although changes were statistically significant, effect sizes were small except for change in global impact (which was medium). However, the change in global impact was not clinically significant for most participants, according to Surendran and Mithun's²⁷ estimation of MCID. Further research in a larger sample may be needed to further explore the clinical

relevance of these changes in various pain management programmes.

Given that changes in beliefs about emotions and changes in emotional expression are associated with less distress, it could be suggested that a specific focus on beliefs and behaviours around emotions is helpful in psychological interventions for people with fibromyalgia. Although this was not a specific focus in the pain management programme, a focus on beliefs, emotions and behaviours is a key part of second- and third-wave therapies, and by nature of attending group programmes, participants are encouraged to talk about their emotions. This may in turn support them in evaluating any unhelpful beliefs about experiencing and expressing emotions. As noted by a Cochrane review, psychological interventions are helpful but the mechanisms are unknown.³⁰ While it is beyond the scope of this research to evaluate the mechanism of change in the pain management programmes, the findings suggest that beliefs and behaviours around emotions may play a role and are worth investigating further in future research. However, the correlation coefficients between the emotional variables and outcomes were low.²⁸ Further research on these variables is warranted to determine their clinical value.

This study suffered from a low response rate which may have impacted its power. A larger sample would have allowed for testing of differences between the programme groups to understand whether all programmes showed the same degree of change in beliefs about emotions and to account for therapist effects. For example, it may be interesting in future to compare the different elements of each programme (e.g. physiotherapy elements compared with psychotherapy). Follow-up rates were related to programme group (each with a different therapist), and therapists varied in their preferred method of data collection and contacting non-responders. It is therefore possible that the non-response rates were due differences in contacting non-responders or data collection method. Response rate could have been improved through using face-to-face follow-up as opposed to postal and online follow-up.

Participants in this study were from different sites and were not diagnosed within this study. Patients reported being diagnosed by a physician. As there is variation in diagnoses of fibromyalgia in clinical practice,³¹ it is possible there is heterogeneity and potential misdiagnoses or inconsistencies in the current sample. Furthermore, data on duration of illness were not collected. It may be that patients who have been experiencing symptoms for longer manage their emotions differently from those who were diagnosed more recently. Future research should include standardised diagnostic assessment and should measure duration of illness.

In future research, the use of a randomised control trial may be helpful to compare an intervention focusing on beliefs and behaviours around emotional expression (such as that developed by Burger et al.¹³) to an intervention without this focus. This would allow for further exploration into how changes in beliefs about emotions and emotional suppression can be targeted in therapy and how they are associated with outcomes in terms of physical health and distress.

This study investigated the relationships between beliefs about the unacceptability of emotions, emotional suppression, distress and global impact in treatment for fibromyalgia and found that there are significant changes in beliefs about the unacceptability of emotions and that changes in these beliefs are related to changes in emotional suppression and marginally related to changes in distress. Changes in distress were significantly related to changes in emotional suppression and in global impact. This finding has implications for clinical practice by highlighting a potential mechanism of change in these interventions via beliefs about emotions and distress. These findings suggest it may be useful for patients with fibromyalgia to be supported in making helpful changes regarding experiencing and expressing emotions to support their management of distress. However, further mediation analyses exploring other possible mechanisms of action of these pain management programmes (such as catastrophising, acceptance of pain, activity pacing and self-compassion^{6,8,32,33}) using a larger sample are necessary to understand how these interventions influence global impact.

Acknowledgements

The authors would like to thank the clinical psychologists who assisted with recruitment and data collection at participating sites.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Contributorship

H.M.B., A.L.W. and T.P. contributed to the design of the research. H.M.B., A.L.W. and G.J. contributed to data collection. H.M.B. led on the manuscript preparation with feedback and contributions from A.L.W., T.P. and G.J.

Ethical approval

Ethical approval for this study was obtained from the university's psychology departmental ethics committee and from the National Health Service Research Ethics Committee (REC ref: 14/WM/1003).

Funding

This study was funded by the university as part of a PhD project.

Guarantor

H.M.B. is the guarantor of this study.

Informed consent

Written informed consent was obtained from all subjects before the study.

ORCID iD

Hannah M Bowers <https://orcid.org/0000-0002-1996-6652>

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