Adjustment to fibromyalgia: The role of domain-specific self-efficacy and acceptance

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Abstract

Objective: Fibromyalgia is a long-term condition of unknown aetiology characterised by widespread pain, fatigue, joint stiffness, and tenderness. Research in long-term conditions traditionally focuses on negative aspects of coping.

The objective of this study therefore was to investigate the role of positive factors such as self-efficacy and acceptance in the context of adjustment to fibromyalgia. Method: The study employed a cross-sectional design using online questionnaires measuring self-efficacy, acceptance, kinesiophobia, coping, catastrophising, pain intensity, and fibromyalgia impact. A total of 117 participants with fibromyalgia (99 female) were recruited from fibromyalgia support-groups, organisations, and online forums.

Results: Data were analysed using multiple regression analysis. After controlling for other cognitive and demographic variables, pain self-efficacy remained a significant predictor of pain intensity ($p = .003$); symptom self-efficacy remained the best predictor of psychological fibromyalgia impact ($p = .001$); and function self-efficacy remained the best predictor of functional ($p < .001$) and total fibromyalgia impact ($p < .001$). However, the contribution of acceptance upon pain intensity and fibromyalgia impact was not significant.

Conclusions: The results highlight the impact of different self-efficacy domains on pain intensity in terms functional, psychological, and total adjustment to fibromyalgia, but suggest that the role of acceptance on these domains is less salient. The implications of these findings for future studies in self-efficacy and fibromyalgia are discussed.

Key words: adjustment, acceptance, fibromyalgia, pain and pain management, positive psychology, self-efficacy

INTRODUCTION

Fibromyalgia

Fibromyalgia is a heterogeneous chronic disease of unknown aetiology affecting approximately 2–7% of the Western population (Branco et al., 2010). It is characterised by widespread pain, fatigue, joint stiffness, and tenderness, (Gran, 2003; Mourao, Blyth, & Branco, 2010). Between 20–80% of fibromyalgia patients also report co-occurring symptoms of mood disorders (Bennett et al., 2009; Fietta, Fietta, & Manganelli, 2007). Given the uncertainty of the diagnosis, high comorbidity, and heterogeneity, fibromyalgia is arguably one of the most difficult pain conditions to adjust to as these factors disrupt everyday life and provide a challenge to individuals' habitual management strategies (Bennett et al., 2009). Adjustment can be defined as the dynamic process of healthy rebalancing to new life circumstances, encompassing physical, functional, and psychological domains (Stanton, Revenson, & Tennen, 2007).

Unfortunately, many individuals with chronic pain continue to experience difficulties in adjusting to their condition (Kerns, Sellinger, & Goodin, 2011; Williams, Eccleston & Morley, 2012).

Coping with fibromyalgia and pain

Research in fibromyalgia has traditionally focused on identifying factors that have contributed to poor adjustment. The most important factors include catastrophising (cognitions of magnification and helplessness), kinesiophobia (fear of movement/re-injury), and passive/avoidant coping strategies (Alda et al., 2011; De Gier, Peters, & Vlaeyen, 2003; Giesecke et al., 2003; Karsdorp & Vlaeyen, 2009; Keefe, Rumble, Scipio, Giordano, & Perri, 2004; Turk, Robinson, & Burwinkle, 2004). These factors have been associated with increased pain, psychological distress, and physical disability (Keefe et al., 2004).

However, most of these approaches have highlighted specifically negative responses to coping. Positive psychologists have long recognised the inherent capacity of people to respond to adversity in ways that are life-enhancing and growth-facilitating (Seligman & Csikszentmihalyi, 2000).

Within rehabilitation psychology, many authors have called for a re-appraisal of positive factors in assisting recovery from illness (e.g., Dunn & Dougherty, 2005). Within pain research specifically, the concept of resilience has emerged as an important determining factor for successful coping with long-term pain (e.g., Kerns et al., 2011; Stanton et al., 2007; Sturgeon & Zautra, 2010). Therefore, the investigation of factors that predict positive, rather than negative, adjustment are more likely to bolster patients' coping and may prove to be more effective in guiding psychosocial interventions (Dunn & Dougherty, 2005). In relation to adjustment to chronic pain, self-efficacy and acceptance have been consistently identified as two of the most important psychological factors in predicting positive coping (Buckelew et al., 1994; Jensen, Moore, Bockow, Ehde, & Engel, 2011; Keefe et al., 2004; Kratz, Davis, & Zautra, 2007; McCracken & Vowles, 2006; McCracken, Carson, Eccleston, & Keefe, 2004; Rodero et al., 2011; Van Liew, Brown, Cronan, Bigatti, & Kothari, 2013).

Self-efficacy and chronic pain

Self-efficacy is the sense of competence and effectiveness in a specific domain (Bandura, 2001). Efficacy beliefs are the foundation for human agency, and self-efficacy itself impacts upon adaptation to challenging life circumstances, including long-term illness (Bandura, 2001). Empirical research consistently suggests that self-efficacy is negatively correlated with pain intensity but positively associated with physical, functional, and psychological adjustment to chronic pain. More specifically, self-efficacy predicts a larger variance of functioning, tension, and mood compared to kinesiophobia, coping, and catastrophising, once pain intensity and re-injury have been statistically controlled for (Denison, Asenlof, & Lindberg, 2004; Jensen, Turner, & Romano, 1991; Lackner, Carosella, & Feuerstein, 1996; Turner, Ersek, & Kemp, 2005).

Self-efficacy also uniquely mediates the relationship between cognitive behavioural therapy and outcome (e.g., pain-related interference, disability), even after controlling for catastrophising, coping, and perceived control (Turner, Holtzman, & Mancl, 2007). Among fibromyalgia patients, self-efficacy has been found to be the best predictor of observed pain behaviour, tender point index, disease severity, physical activity, and patient pain ratings (Buckelew et al., 1994), as well as long-term depression, physical functioning, and pain intensity over time (Van Liew et al., 2013), even after

controlling for myalgic scores, age, and psychological and physical functioning. The importance of selfefficacy as a positive psychological factor in successful coping with fibromyalgia is therefore clear.

Acceptance and chronic pain

In pain research, acceptance has become defined as a willingness to tolerate negative sensations and engage in valued activity, despite the presence of negative sensations such as pain (McCracken & Vowles, 2006). Clients are encouraged to reduce symptoms that cannot be controlled (i.e., pain), but instead direct efforts towards valued and achievable goals (Hayes, Strosahl, & Wilson, 1999). High acceptance predicts positive adjustment and provides a buffer against negative psychological factors such as catastrophising (McCracken, 1998; McCracken & Eccleston, 2005; Rodero et al., 2011; Viane et al., 2003). In one study for example, acceptance was the only predictor of functional status and functional impairment, even after it was entered in the analysis together with catastrophising and coping (Esteve, Ramirez-Maestre, & Lopez-Martinez, 2007). Along with selfefficacy therefore, acceptance appears to be a valuable construct in assessing positive coping for symptoms related to long-term illness.

Self-efficacy and acceptance in chronic pain

Given the importance of self-efficacy and acceptance in predicting adjustment to chronic pain, it is therefore surprising that there is a lack of studies that have investigated the impact of both self-efficacy and acceptance together. For example, only one study (Nicholas & Asghari, 2006) investigated the effects of these predictors upon depression and functioning on a sample of chronic pain patients with back and widespread pain. The authors found that the Activity Engagement subscale of the Chronic Pain Acceptance Questionnaire (CPAQ) remained the best predictor of depression.

However, the results also indicated that self-efficacy was a better predictor of functioning (Nicholas & Asghari, 2006). Despite these results, it is worth noting that Nicholas and Asghari (2006) only examined self-efficacy for performing specific tasks (functional self-efficacy) and did not analyse the CPAQ subscales together. Thus, the precise interaction between acceptance and self-efficacy remain unclear.

Purpose of study

Self-efficacy is domain-specific and may therefore relate to different adjustment outcomes. In relation to chronic pain, three domains have been identified: pain self-efficacy (SEP) for managing pain; function self-efficacy (SEF) for managing activities; and symptom self-efficacy (SES) for managing related symptoms, such as depression (Turner et al., 2005). Although few studies that have investigated domain-specific self-efficacy, each self-efficacy domain is related to a different aspect of adjustment (e.g., Lorig, Chastain, Ung, Shoor, & Holman, 1989).

The objective of this study was to therefore investigate the impact and role of SEP, SEF, SES, and acceptance, in the context of kinesiophobia, catastrophising, and coping, in accounting for pain intensity and adjustment (functional, psychological, and total) to fibromyalgia. It was predicted. that self-efficacy domains and acceptance would remain a significant predictor of pain intensity,

functional, psychological, and total adjustment after controlling for kinesiophobia, catastrophising, and coping.

METHODS

Participants Overall, 148 participants diagnosed with fibromyalgia consented to take part in the study. Diagnosis was established through participant self-report. Eligibility included: (1) diagnosis of fibromyalgia; (2) 18 years or older; (3) proficiency in English; and (4) the presence of psychiatric symptoms arising from a major neurocognitive disorder or active psychosis that would prevent participation. The presence of such factors was established through self-report.

Procedure

Participants were recruited from fibromyalgia support groups, organisations, and forums across the UK and the USA. Gatekeepers were contacted via email to ask for permission to advertise and upload the study on their webpage or forums. After permission was obtained, a hyperlink of the study with a promotional text was uploaded on the website of fibromyalgia support-groups, organisations, and forums.

The hyperlink directed participants to the study survey, which included study information, consent form, the questionnaires, and a debrief sheet. Participants confirmed that they understood the nature of the study and consented to take part by pressing the next button before proceeding to the questionnaires.

Design

This study used a cross-sectional design. Data were collected using online questionnaires examining levels of domainspecific self-efficacy, acceptance, coping, kinesiophobia, catastrophising, and pain intensity, psychological well-being, functioning, and total fibromyalgia impact.

The Institute of Work, Health and Organisations, University of Nottingham research ethics committee approved the study.

MEASURES

Demographic measures

Demographic information included age, gender, marital status, ethnicity, number of different classes of medication used to control pain, education level, and employment status.

Arthritis Self-Efficacy Scale (ASES)

The ASES is a 20-item scale measuring self-efficacy for pain, functioning, and symptoms, and has been used with fibromyalgia patients (Lorig et al., 1989; Van Liew et al., 2013). The ASES has high internal ($.75 \leq \alpha \leq .89$) reliability, and satisfactory construct and concurrent validity (Barlow, Williams, & Wright, 1997; Lorig et al., 1989).

CPAQ

CPAQ is a 20-item inventory designed to measure acceptance of pain and includes two subscales: activity engagement and pain willingness (McCracken, Vowles, & Eccleston, 2004). The CPAQ has high internal consistency (α = 0.78– 0.82; McCracken et al., 2004) and significantly correlates with functioning, depression, anxiety, and psychosocial disability (McCracken & Eccleston, 2003). In this study, the total score was used.

Revised Fibromyalgia Impact Questionnaire (R-FIQ)

The R-FIQ is a 21-item questionnaire that includes three subscales that measure fibromyalgia functional impact (R-FIQ function), psychological impact (R-FIQ symptom), and overall impact (R-FIQ total; Bennett et al., 2009). The R-FIQ provides high internal consistency (α = 0.95), a good construct, discriminant, and concurrent validity (Bennett et al., 2009; Srifi et al., 2013).

The Present Pain Intensity (PPI)

The PPI (Melzack, 1987) is a tool to assess the pain intensity on a scale of 0 (no pain) to 5 (excruciating). The PPI, which is a part of short-form McGill Pain Questionnaire, has been widely used in chronic pain research (Dworkin et al., 2009).

Tampa Scale for Kinesiophobia (TSK)

The TSK is 17-item scale developed to measure kinesiophobia/fear of movement and activity (Miller, Kori, & Todd, 1991). A review, which included fibromyalgia patients, estimated the internal reliability as high (Lundberg, Grimby-Ekman, Verbunt, & Simmonds, 2011).

Pain Catastrophising Scale (PCS)

The PCS is 13-item scale developed to measure catastrophising related to chronic pain (Sullivan, Bishop, & Pivik, 1995). The PCS has been validated on a sample of chronic back pain patients. Internal consistency was estimated as moderate to high (Sullivan et al., 1995).

Medical Coping Modes Questionnaire (MCMQ)

The MCMQ is a 19-item scale developed to identify coping strategies (confrontation, avoidance, and resignation) in Adjustment to fibromyalgia dealing with illness (Feifel, Strack, & Nagy, 1987). The construct validity and internal reliability has been reported as moderate to high (Rodrigue, Jackson, & Perri, 2000).

ANALYSIS

There were missing data from 31 participants who were removed from the analysis, resulting in a final sample of 117 participants. List-wise deletion was used since there were many missing values, which can distort the results (Field, 2009). Data were analysed using IBM SPSS 19. Data were tested for assumptions of multiple linear regression (Osborne &Waters, 2002). The Durbin-Watson statistics were between 1–3 in all analyses (range; 1.84–2.30), indicating that the assumption of independence of errors is tenable. Most VIF values for all predictors were close to 1, and all Tolerance values were greater than 0.3; therefore there were no co-linearity in this data. For multicolinearity, a series of correlation analyses between the predictors did not indicate correlation coefficient above r = .8.

To test for the predictive value of each predictor variable, a series of Pearson's forced entry multiple linear regressions were carried out. The method of analysis for the final data set was hierarchical multiple linear regressions. The criterion variables included pain intensity (PPI), fibromyalgia functional impact (R-FIQ function), fibromyalgia psychological/ symptom (R-FIQ symptom) impact, and total fibromyalgia impact (R-FIQ total).

A post hoc power analysis was conducted using G*Power 3.1, linear multiple regression, fixed model R2 deviation from zero (Faul, Erdfelder, Buchner, & Lang, 2009). Pain intensity was chosen as the response variable because it was the variable with the lowest R2. Statistical power was calculated using a sample size of 117 with nine predictor variables, an effect size of f 2 = 1.14 (calculated using the formula f 2 = R2/1 − R2), and alpha level 0.05. This showed a post hoc power level of 1.0.

RESULTS

Demographic and clinical characteristics of participants are presented in Table 1. The majority of participants were female, married, aged 45–54, and had a bachelor's degree or higher. The majority were also in full-time/part-time employment and used at least one class of medication to control their pain.

Descriptive data on impact and cognitive characteristics among 117 participants are presented in Table 2. The nature and impact of the predictors (self-efficacy, acceptance, catastrophising, kinesiophobia, and coping strategies) upon the criterion variables (pain intensity, functional, psychological, and total fibromyalgia impact) were explored in a series of hierarchical multiple regression analyses. Self-efficacy scales were entered in the last block, after acceptance, cognitive, and demographic variables.

Pain intensity

In this analysis, pain intensity was predicted by SEP (block 3), controlling for acceptance, SEF, kinesiophobia,

Table 1 Demographic and clinical characteristics

Variable Frequency Percent (%)

Gender (female) 99 84.6

Ethnicity (white British) 112 95.7

Age (years)

18–24 3 2.6

25–34 13 11.1

35–44 28 23.9

45–54 43 36.8

55– 0 0

Relationship status

Single 25 21.4

Married 74 63.2

Partnership but not married 11 9.4

Other 7 6.0

Education

Primary 24 20.5

A-levels 23 19.7

Bachelors or higher 50 42.8

Other 20 17.1

Employment (employed) 67 57.3

Prescribed medication usage

No medication 19 16.2

1 class 31 26.5

2–4 classes 57 48.7

5 or more classes 7 6.0

Unclear 3 2.6

Table 2 Impact and cognitive characteristics

Variable Mean (SD) Range

Impact characteristics

Pain Intensity (SF-MPQ) 3.13 (1.08) 0–5

Functional Impact (R-FIQ

Function)

17.79 (7.59) 0–30

Psychological Impact (R-FIQ

Symptom)

31.83 (9.05) 2–49.5

Total Impact (R-FIQ Total) 61.70 (19.82) 2–99.5

Cognitive characteristics

Pain Self-Efficacy (ASES Pain) 4.93 (2.43) 1.25–12.5

Function Self-Efficacy (ASES

Function)

5.28 (2.53) 1–10

Symptom Self-Efficacy (ASES

Symptom)

3.99 (2.10) 1–10

Acceptance (CPAQ total) 57.05 (19.29) 12–106

Catastrophising (PCS total) 19.70 (13.51) 0–52

Kinesiophobia (TSK) 34.34 (8.23) 17–58

Confrontation Coping (MCMQ) 20.39 (4.36) 11–31

Acceptance/Resignation

Coping (MCMQ)

9.00 (2.72) 4–16

Avoidance (MCMQ) 17.03 (3.56) 8–27

See Measures section.

catastrophising, confrontational coping, resignation coping (block 2), employment status, and number of medication classes used to control pain (block 1). Table 3 shows the result for this analysis. The final model was significant ($F(9, 107) = 13.57$, $p < .001$), accounting for approximately 49% of the variance of pain intensity ($R2 = .53$, adjusted $R2 = .49$). Controlling for the other variables, SEP significantly predicted 4.1% of unique variance ($\beta = .279$, $p = .003$).

However, the largest contribution was provided by confrontational and resignation coping (β = .282, p < .0001; β = .282, p = .004), although employment status and number of medication classes used also made a significant contribution to the variance (β = −.202, p = .008; β = .162, p = .023). The contribution of acceptance was completely eliminated.

Fibromyalgia functional impact

In this analysis, fibromyalgia functional impact (R-FIQ function) was predicted by SEF (block 3), acceptance, pain intensity, catastrophising, kinesiophobia, all coping strategies (block 2), employment status, and number of medication classes used to control pain (block 1). The results are presented in Table 4. The final model was significant (F(10, 106) = 16.19, p < .001), accounting for approximately 60% of the variance of fibromyalgia functional impact (R2 = .60, adjusted R2 = .56). Controlling for the other variables, SEF remained the strongest predictor, accounting for 15.5% of unique variance of the final model (β = −.496, p < .001).

Additionally, pain intensity (β = .236, p = .008) and avoidance coping (β = .166, p = .011) also remained significant predictors in the final model. The contribution of acceptance remained non-significant.

Fibromyalgia psychological impact

In this analysis, fibromyalgia psychological impact (R-FIQ Symptom) was predicted by SES (block 3), acceptance, SEF, pain intensity, catastrophising, kinesiophobia, all coping strategies (block 2), employment status, and number of medication classes used (block 1). The results are presented in Table 5. The final model was significant Table 3 Multiple linear regression analysis predicting Pain Intensity Blocks and Predictors R2 Adjusted R2 R2 Change βa p-Value

Criterion variable: Pain Intensity .53 .49 <.001

Block 1

Employment .149 .134 −.202 .008

No. of Med. .162 .023

Block 2

Acceptance .492 .455 .344 .043 .683

Func. Self-Efficacy −.067 .442

Kinesiophobia −.102 .244

Catastrophising .175 .138

Confrontational .282 <.001

Resignation .282 .004

Block 3

Pain Self-Efficacy .533 .494 .041 −.279 .003

A

Standardised Regression Coefficient.

Table 4 Multiple linear regression analysis predicting FM Functional Impact

Blocks and Predictors R2 Adjusted R2 R2 Change βa p-Value

Criterion variable: Functional FM Impact .60 .56 <.001

Block 1 −.040 −580

Employment .131 .116 .084 .201

No. of Med.

Block 2

Acceptance .450 .404 .319 −.132 .169

Kinesiophobia −.039 .634

Catastrophising −.041 .711

Confrontational .028 .682

Resignation .027 .771

Avoidance .166 .011

Pain Intensity .236 .008

Block 3

Func. Self-Efficacy .604 .567 .155 −.496 <.001

FM = fibromyalgia.

aStandardised Regression Coefficient.

(F(10, 106) = 19.90), p < .001), accounting for approximately

62% of the variance of fibromyalgia psychological impact (R2 = .65, adjusted R2 = .62). Controlling for the other variables, SES remained the strongest predictor, accounting for 4% of unique variance (β = −.334, p = .001).

Additionally, pain intensity (β = .301, p < .001), SEF (β = .262, p = .001), and catastrophising (β = .209, p = .048) also remained significant predictors in the final model. The contribution of acceptance was completely eliminated.

Total fibromyalgia impact

In the first analysis, total fibromyalgia impact (R-FIQ total) was predicted by SEF (block 3), acceptance, SES, pain intensity, catastrophising, kinesiophobia, all coping strategies (block 2), employment, and number of medication classes used (block 1). The results are presented in Table 6. The final model was significant ($F(11, 105) = 25$, $p < .001$), accounting for approximately 69% of the variance of total fibromyalgia impact ($R2 = .72$, adjusted $R2 = .69$). Controlling for the other variables, SEF remained the strongest predictor, accounting for 5.7% of unique variance ($\beta = -.320$, $p < .001$). Additionally, pain intensity ($\beta = .303$, $p < .001$) and SES ($\beta = -.274$, $p = .002$) also remained significant predictors in the final model. The contribution of acceptance was completely eliminated.

DISCUSSION

The study examined the role of positive factors in adjustment to fibromyalgia, specifically the relationship of self-efficacy and acceptance in predicting pain intensity, functional, psychological, and total adjustment to fibromyalgia, while controlling for the effects of catastrophising, kinesiophobia, and coping. The demographic, impact, and Table 5 Multiple linear regression analysis predicting FM Psychological Impact Blocks and Predictors R2 Adjusted R2 R2 Change βa p-Value Criterion variable: Psych. FM Impact .65 .62 <.001

Block 1

Employment .135 .120 −.104 .123

No. of Med. .020 .749

Block 2

Acceptance .612 .579 .477 −.029 .320

Func. Self-Efficacy −.262 .001

Kinesiophobia −.090 .237

Catastrophising .209 .048

Confrontational .051 .430

Resignation −.111 .217

Pain Intensity .301 <.001

Block 3

Symp. Self-Efficacy .653 .620 .040 −.334 .001

FM = fibromyalgia.

aStandardised Regression Coefficient.

Table 6 Multiple linear regression analysis predicting Total FM Impact

Blocks and Predictors R2 Adjusted R2 R2 Change βa p-Value

Criterion variable: Total FM Impact .72 .69 <.001

Block 1

Employment .142 .127 −.050 .409

No. of Med. .040 .468

Block 2

Acceptance .667 .635 .525 .095 .100

Symp. Self-Efficacy −.274 .002

Kinesiophobia −.066 .337

Catastrophising .022 .817

Confrontational .045 .437

Resignation −.032 .690

Avoidance .095 .083

Pain Intensity .303 <.001

Block 3

Func. Self-Efficacy .724 .695 .057 −.320 <.001

FM = fibromyalgia.

aStandardised Regression Coefficient.

cognitive characteristics of the sample were largely within the range reported in the literature (e.g., Bennett et al., 2009; Denison et al., 2004; Feifel et al., 1987; Lorig et al., 1989; McCracken & Keogh, 2009; Melzack, 1987; Nicholas & Asghari, 2006; Palomino, Nicassio, Greenberg, & Medina, 2007; Sullivan et al., 1995; Van Liew et al., 2013; Vowles, McCracken, & Eccleston, 2008).

The results showed that after controlling for other cognitive and demographic variables, self-efficacy scales remained the strongest predictors of functional, psychological, and total adjustment to fibromyalgia. Self-efficacy was also a significant predictor of pain intensity. The contribution of acceptance upon all criterion variables was virtually eliminated.

Alongside these results, coping strategies (confrontational and resignation) were the strongest predictors of pain intensity (albeit positively), although SEP remained a strong predictor.

Based on previous research, it is perhaps not surprising that self-efficacy was shown to be an important factor in understanding adjustment to fibromyalgia (e.g., Turner et al., 2007; Van Liew et al., 2013). However, this study further highlighted the impact of different self-efficacy domains (i.e., pain, functional, symptom) on adjustment variables (Turner et al., 2005), thus emphasising the importance of considering domain-specific self-efficacy in order to fully understand various aspects of fibromyalgia adjustment.

Specifically, the results revealed that SEP was a strong predictor of pain intensity, SES was the strongest predictor of psychological adjustment (R-FIQ Symptoms), and SEF was the strongest predictor of functional (R-FIQ Function) and total adjustment (R-FIQ Total). The results therefore suggest that individuals who felt better able to manage their pain, functioning or symptoms were also likely to report lower pain intensity, functional impairment or fibromyalgiarelated psychological symptoms.

However, the results did not support the hypothesis that acceptance would significantly predict outcome variance in pain intensity and adjustment to fibromyalgia after controlling for other cognitive variables. In some ways, this finding is partly consistent with the results of Nicholas and Asghari (2006) but is inconsistent with other studies that found acceptance to predict positive adjustment to chronic pain (McCracken & Vowles, 2006).

Three possible explanations are postulated to explain these differences. Firstly, following Nicholas and Asghari (2006), there may be limitations in how acceptance is measured (i.e., via the CPAQ). However, further in-depth scrutiny would be required to support this hypothesis as considerable analysis have supported the validity of the CPAQ (e.g., McCracken et al., 2004; Bendayan, Esteve, & Blanca, 2012; Fish, Hogan, Morrison, Stewart, & McGuire, 2013). Secondly, the cross-sectional design restricts reliable and unambiguous causative inferences. Thirdly, the results may reflect the addition of domain-specific self-efficacy, suggesting that changes in pain, functional, or symptom self-efficacy is more important in explaining adjustment than changes in acceptance,.

This conclusion is consistent with the results of Nicholas and Asghari (2006). However, further research is needed to establish these explanations. Implications of findings Rehabilitation programmes for pain do not always focus on the most salient empirical factors in predicting positive adjustment to pain (Valente, Ribeiro, & Jensen, 2009). Identifying sources of positive coping, such as self-efficacy, may enable more successful adjustment among people with chronic pain, including the enhancement of positive function and well-being (Sturgeon & Zautra, 2010). Indeed, selfefficacy-based interventions seem to promote a motivational context that makes it easier for people to adjust (Ryan, Lynch, Vansteenkiste, & Deci, 2011).

Self-efficacy is therefore an appealing concept in the context of pain treatment, since it redirects attention to the client's strengths in adversity, rather than focus on insurmountable difficulties (Keefe et al., 2004; Valente et al., 2009). Moreover, treatments targeting self-efficacy may benefit from protocols specifically intended to enhance and maintain domain-specific self-efficacy (i.e., pain vs. functional vs. symptom) in clients. Such interventions, however, need to first identify specific outcome domains (e.g., pain, psychological vs. functional vs. total adjustment) based on the patient's main priorities and goals (Keefe et al., 2004).

Further research could address the unexplained variance in the current regression models. Time since diagnosis was not recorded and so it is possible that the variance could be explained by duration of illness (Wolfe et al., 1997). In addition, previous research suggests variables such as fatigue, dolorimetry, tender points, and social support predict variance in pain intensity and adjustment (Franks, Cronan, & Oliver, 2004; Wolfe, 1997; Wolfe, Ross, Anderson, Russell, & Hebert, 1995). These factors, along with time since diagnosis, could be recorded in future studies to increase the predicative validity of regression models. Finally, future research could build on the current cross-sectional study using experimental, treatment or longitudinal designs (Hayes et al., 1999). Such designs may further elaborate the validity, reliability, and the long-term effects of these constructs, and pilot positive psychological interventions for chronic pain.

Study limitations

Several limitations of the study deserve discussion. Firstly, this was a cross-sectional study and so unable to identify causal factors. Additionally, closed questionnaires are unable to capture the wider context and time frame of a particular condition. Also, the current study was conducted online and Adjustment to fibromyalgia was based on a sample whose members were part of support groups, organisations, and forums. Therefore, the results may not be generalisable to non-internet users. Along with this, fibromyalgia diagnosis was established by participant selfreport meaning their exact clinical status was uncertain.

Finally, the study sample was modest given the number of predictor variables included, which could have resulted in some effects remaining undetected. Despite these limitations however, this study was also built upon empirically derived data, using validated questionnaires, and so therefore provides a useful basis for further exploration of these important concepts.

CONCLUSION

In conclusion, the present study suggested that domainspecific self-efficacy was strongly predictive of pain intensity, functional, psychological, and total adjustment to fibromyalgia, whereas acceptance did not predict pain intensity or adjustment to fibromyalgia once other cognitive variables were accounted for. Therefore, the importance of addressing and developing domain-specific self-efficacy for specific adjustment outcomes has been highlighted, and may offer some utility in guiding pain treatment programmes based on the principles of positive psychology.

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