Emotional Awareness Predicts Pain in Fibromyalgia Patients

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Abstract

Fibromyalgia (FM) is a neural musculoskeletal disorder characterized by widespread fatigue, pain, tenderness, trouble sleeping, and mood disturbances. Although the cause of FM is unknown, patients with FM commonly display deficits in emotional awareness. Previous research showed that emotional awareness and expression therapy improves pain, cognitive dysfunction, anxiety, depression, positive affect, and overall FM symptoms, but did not improve fatigue. Therefore, this study examines whether emotional awareness is related to both FM pain and fatigue, after controlling for sex, age, education, and negative affect. A total of 230 FM patients volunteered for a treatment study. At baseline, they completed the Levels of Emotional Awareness Scale, the Patient-Reported Outcomes Measurement Information System Fatigue Short Form, the Brief Pain Inventory, and the Positive and Negative Affect Schedule. Emotional awareness improved prediction of FM pain but not fatigue. This suggests that FM pain and fatigue may have different mechanisms.

Introduction

Fibromyalgia (FM) syndrome is characterized by ubiquitous musculoskeletal pain and tenderness, fatigue, trouble sleeping, and mood disturbances (Middendorp et al., 2008). No known organic disease causes the bodily pain and tenderness experienced by FM patients (Giacomelli et al., 2011; Mease, 2005; Mease, Buskila, & Sarszi-Puttini, 2009). Although etiological findings for FM are sparse, previous data suggest that FM may be a central sensitization syndrome (Williams & Gracely, 2006). FM afflicts 3-6% of the world's population (World Health Organization [WHO], 2008); predominantly affecting females over the age of 50 (Fietta, Fitetta, & Manganelli, 2007).

A variety of factors such as age, sex, and catastrophic thinking, are correlated with FM pain levels (Campbell et al., 2012). Although negative affect plays a hand in worsening FM symptoms, emotional-regulation strategies have helped patients abate and cope with their symptoms (Middendorp et al., 2008). Pharmacological methods are also utilized to treat pain (Staud, Vierck, Robinson, & Price, 2006). However, neither pharmacological nor non-pharmacological methods have been found to be effective universal treatments for FM syndrome (Staud et al., 2006). It is possible that an accurate way to predict FM pain and fatigue could help patients anticipate and eventually ameliorate their pain and other symptoms.

Patients with FM commonly display deficits in emotional awareness (EA), the ability to recognize their own and others' emotions (Lane, Quinlan, Schwartz, Walker, & Zeitlin, 1991; Middendorp et al., 2008). The purpose of this study is to evaluate if emotional awareness improves the prediction of FM pain and fatigue, after controlling for age, sex, education and negative affect. To do so, we used five measures that tested three different constructs: emotional awareness, pain, and fatigue.

Method

Participants

This study used the same participants and raw data as Lumley et al.'s 2017 study. There were 230 participants comprised of 14 men and 216 women. The participants' mean age was 49.1 years, with the standard deviation of 12.22 years. The youngest participant was 20 years-old while the oldest was 74 years-old. There are 179 participants who identified as White and 41 participants who identified as Black, while 10 of the participants classified themselves as other.

Participants were recruited from the Wayne State University and the University of Michigan. Recruitment methods included community advertisements, flyers at rheumatologist offices, announcements to groups, and associations for FM patients, and workshops (Lumley et al., 2017). Following recruitment, participants had telephone and face-to-face screenings where they received written informed consent. Recruitment was not limited to specific risk factors, though there were exclusions to ensure that the primary concern would be FM . All participants had FM as defined by the American College of Rheumatology 1990 or 2011 criteria (Lumley et al., 2017).

Measures

Levels of Emotional Awareness Scale (LEAS; Barchard et al., 2011) was used to measure emotional awareness. LEAS is composed of three specific measures: LEAS Self, LEAS Other, and LEAS Total. All measures are comprised of 20 open-ended scenarios with the intention of evoking an emotional response involving two people (Barchard et al., 2011). Each item has two questions, "How would you feel?" and "How would the other person feel?". Self and other score responses to each LEAS item were scored separately. Item scores are then added together (self and other) to calculate the total score on per item. Responses are scored based upon the type of words used: More specific emotion words resulting in higher scores (Barchard et al., 2011).

The Brief Pain Inventory (BPI) (Cleeland, 2009) was used to measure the subjective level of pain felt by each participant and how much pain interferes with daily activities. BPI contains two body diagrams, four pain severity items, and seven pain interference scale items (Cleeland, 2009). Body diagrams are used by the participant to denote where they feel pain. To assess pain severity, BPI uses the response scale: worst, least, average, and now (current pain). Scoring is determined by how much pain has interfered in seven particular daily activities: general activity, walking, work, mood, enjoyment of life, relations with others, and sleep (Cleeland, 2009). Pain Severity is scored as the mean of the four severity items (Cleeland 2009). Pain interference is scored as the mean of the seven interference items (Cleeland 2009). Higher scores indicate higher levels of pain severity and interference in their daily lives (Cleeland 2009).

The Patient-Reported Outcomes Measurement Information System (PROMIS) Fatigue Short Form (Cella, Yount, & Rothrock, 2007) was used to assess the fatigue construct. PROMIS is administered as a self-report measure for a multitude of factors including fatigue, pain intensity, pain interference, physical function, and sleep disturbance (Cella et al., 2007). PROMIS Fatigue Short Form contains seven items that measure both the experience of fatigue and interference of fatigue on daily activities. PROMIS uses a 5-point response scale ranging from 1="never" to 5="always." For accuracy, these items are scored using scoring tools through Assessment Center Scoring Service (Cella et al., 2007). Higher scores indicate higher fatigue interference with daily life.

The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) can be used to measure both positive and negative affect. In our analyses, we used only the Negative Affect Scale, consisting of 10 items that assess emotions associated with negative affect, including anger, guilt, fear, and distress. Respondents indicate the intensity of each emotion using a 5-point scale (Watson et al., 1988). Higher scores indicate higher negative affect.

Procedure

Our study used the same procedure as Lumley et al.'s 2017 study on FM and emotional awareness. All the data used in this study came exclusively from the pretreatment baseline. More information on the procedures of this study can be found in Lumley et al. 2017.

Data Analysis

To determine if LEAS hand scores improve the prediction of FM pain and fatigue when controlling for sex, age, education, and negative affect, we conducted hierarchical multiple regression analyses. Using two blocks, we created two models to determine if there was a significant change when adding LEAS score as a predictor. For step 1 (block 1), our predictors included education, sex, negative affect, and age. For step 2 (block 2), our predictors included the same four variables we started with, but with the addition of LEAS sums for Self, Other, and Total. We used the same predictors for both steps for BPI measuring "pain" and PROMIS measuring "fatigue" running two separate regressions.

Results

Looking at fatigue predictability, the Hierarchical Multiple Regression using LEAS Hand scores while controlling for sex, age, negative affect and education showed that negative affect is the only variable that made a significant contribution to the prediction of FM fatigue (beta = .45, $p < .001$). There was no significant change with the addition of LEAS sums (R-squared change = .01, $p > .05$).

When looking at pain predictability, the Hierarchical Multiple Regression of Pain when controlling for sex, age, negative affect, and education shows that negative affect is the only variable to have a significant contribution to the prediction of FM pain (beta = .17, $p < .001$). There was significant change with the addition of LEAS (R-squared change = .09, $p > .05$). Although LEAS Self scores had the highest beta-weight among all other LEAS variables, that beta-weight was not statistically significant.

Discussion

The purpose of this study was to evaluate whether LEAS hand scores improve the prediction of FM pain and fatigue, after controlling for sex, age, education, and negative affect. We found that although LEAS Hand Scoring does significantly improve the prediction of FM pain, it does not however significantly improve the prediction of fatigue. Although LEAS improves the predictability of FM pain, we could not determine which specific measure (Self, Other, or Total) was responsible.

Previous research showed that emotional awareness and expression therapy improves overall symptoms, widespread pain, physical functioning, cognitive dysfunction, anxiety, depression, positive affect, and life satisfaction (Lumley et al., 2017). In the therapy sessions, patients identified emotions they had avoided and expressed them through role-playing and empty chair techniques. Outside of sessions, patients were encouraged to engage in expressive writing and to be honest about their emotions with the significant people in their lives (Lumley et al., 2017). Perhaps this treatment was effective because it reduced negative affect and improved emotional awareness. We found the Negative affect alone had the most single variable contribution to the prediction of both FM pain but that incorporating LEAS with affect improvement increased the predictability of FM pain significantly (R^2 increases by .09, so the model explains 9% more variance). Unfortunately, we were unable to determine why and how LEAS improved prediction of FM pain because we don't know which of the LEAS variables in particular is responsible for this increase. The one with the highest beta-weight is LEAS Self scores, but that beta-weight is not quite statistically significant. Because deciphering these questions could lead to improved prediction and possibly even improved treatment of FM pain, future FM research should focus on determining the cause of the improvement demonstrated by incorporating LEAS.

Table 1
Hierarchical Multiple Regression Predicting FM Fatigue and Pain

	Fatigue		Pain	
Predictors	ΔR^2	β	ΔR^2	β
Step 1	.22**		.20	
Sex		.01		-.01
Age		-.02		-.07
Negative Affect		.45**		.15*
Highest Education		-.08		-.06
Step 2	.01		.09*	
Sex		.00		-.04
Age		-.04		-.12
Negative Affect		.45*		.17*
Highest Education		-.06		-.01
LEAS Self Score		.06		-.27
LEAS Other Score		.12		.10
LEAS Total Score		-.22		-.00

* $p < .05$. ** $p < .001$.

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