FOREWARNED: Emotional Awareness Predicts Fibromyalgia Pain

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ABSTRACT

Fibromyalgia (FM) patients often have chronic pain, fatigue, and diminished quality of life (Segura-Jimenez & Borges-Cosic, 2015). FM is more common in women (Lumley et al., 2017), who tend to feel more fatigue and have less physical impairment than men (Aparicio et al., 2012), and older patients have longer-lasting pain and lower well-being (PeñAcoba et al. 2013). FM pain is also associated with depression and anxiety (Scheidt et al., 2014). This association may exist because FM puts stress on the individual (Furlong, Zautra, Puente, López-López, & Valero, 2010) or because psychological distress lowers individuals' pain perception threshold (Scheidt et al., 2014). Thus, addressing negative emotions more effectively may result in fewer FM symptoms. Lumley et al. (2017) examined the effect of emotion awareness and expression therapy on FM symptoms. This therapy includes many components, such as role-playing, expressive writing, and the empty chair technique. It reduced overall FM symptoms, depression, and anxiety, but had no effect on FM pain. Therefore, our study examined whether emotional awareness is related to both FM pain and fatigue after controlling for age, sex, education, and negative affect.

Adults diagnosed with FM (n = 230) were recruited from the community to participate in a treatment study. The data for this current project were obtained at baseline. Participants completed three measures: the Levels of Emotional Awareness Scale (Lane, Quinlan, Schwartz, Walker & Zeitlin, 1991), the Patient-Reported Outcomes Measurement Information System Fatigue Short Form (Cella et al., 2007), and the Brief Pain Inventory (Cleeland, 2009).

Using hierarchical multiple regression to control for sex, age, education, and negative affect, we found emotional awareness improved prediction of FM pain, though not fatigue. For pain, none of the control variables were significant predictors at step 1, but emotional awareness did improve prediction at step 2. For fatigue, only negative affect was a significant predictor: It predicted pain at step 1 and emotional awareness did not improve prediction at step 2. This suggests that FM pain and fatigue may have different mechanisms..

INTRODUCTION

Fibromyalgia (FM) is a complex multidimensional syndrome characterized by chronic pain throughout the body as well as symptoms of fatigue, emotional disturbances, and general diminished quality of life (Segura-Jimenez & Borges-Cosic, 2015). Though FM is more prevalent in women than in men (Lumley et. al., 2017), there are men who have FM but display different symptoms from women (Castro-Sanchez et al., 2012). Research showed that there were significant differences between male and female patients, with overall FM impact and physical impairment being lower in women with FM (Aparicio et al., 2012). They also found that women feel more fatigue, whereas men present higher FM global impact and worse physical impairment (Aparicio et al., 2012). Age also seems to influence symptom expression in patients with FM. Older patients reported longer-lasting pain in physical functioning and well-being when compared to younger patients (PeñAcoba et. al., 2013).

Emotional awareness is the cognitive skills that allows you to describe your own emotions as well as the emotions of others (Lane & Schwartz, 1987). People with higher levels of emotional awareness are able to better identify and integrate emotional information. According to Lumley et al. (1996) the inability to identify emotions could result in increased negative effects such as depression and anxiety. Alternatively, the pain that comes from FM can trigger negative affective states (e.g., anxiety and depression) because of the stress it puts on the individual (Furlong, Zautra, Puente, López-López, & Valero, 2010). Depression and anxiety may lower an individual's pain perception threshold as well (Scheidt et al., 2014). In a study of patients with FM, Scheidt et al. (2014) found that psychological distress, such as depression and anxiety, is associated with increased perception of pain, a main component of fibromyalgia.

Due to these connections, our research focuses on if LEAS hand scores improve the prediction of FM pain and fatigue, after controlling for sex, age, education, and negative affect. We needed to control these variables due to how there are differences in people that occur in each of these four variables. If LEAS hand scores can improve the prediction of FM pain and fatigue, researchers may be able to find innovative ways to prevent further negative symptom expression and help improve the lives of numerous FM patients. Pain, especially combined with fatigue, disrupts the lives of many patients, so if we could improve the prediction of the symptom, it could result in effective life improvement.

METHOD

Participants

There were 230 fibromyalgia patients that participated in this study. Two-hundred and sixteen of these participants were female making up 93.9% of the participants. The other 14 participants were male, making up 6.1% of the participants. The ages of the participants ranged from age 20 to age 74. The mean age of the patients was 49.1 years old with a standard deviation of 12.2 years. There are 219 participants who identified as White, and 8 participants who identified as Black, while 3 of the patients did not identify as Black or White.

Measures

In order to determine the results of our research questions, we used five measures that tested for three different constructs: emotional awareness, pain, and fatigue.

For emotional awareness, we used the Levels of Emotional Awareness Scale (LEAS), with specific measures for LEAS Self, LEAS Other, and LEAS Total, (Lane, Quinlan, Schwartz, Walker & Zeitlin, 1991). This scale contains 20 open-ended scenarios that involve two people, oneself and another, and are meant to evoke an emotional response. Participants are required to answer two questions: "How would you feel?" and "How would the other person in the same scenario feel?" (Barchard et al., 2011). Hand scores are specifically calculated in a three-step process. Hand scores are calculated in a three-step process (Barchard et al., 2011). First, individual words and phrases are assigned scores from 0 to 3, with higher scores indicating more precise emotions. Second, Self and Other scores are calculated as the highest Word-level scores for the emotions attributed to that person. However, if two non-synonymous level-3 words are given, the score is 4. Third, the Item score is calculated as the maximum of the Self and Other scores, unless both are scored 4 and describe non-identical emotional responses, in which case the Item score is 5.

In order to test for the construct pain, we used the Brief Pain Inventory (BPI; Cleeland, 2009). According to Cleeland (2009), the BPI allows patients to rate the severity of their pain to the degree in which it interrupts their life. It contains two body diagrams, four pain severity items, and seven pain interference scale items. BPI assess pain using the response scale ranging from "worst" to "now." The scoring is then determined by how much pain has interfered with seven daily activities: general activity, walking, work, mood, enjoyment of life, relations with others, and sleep. The mean is calculated from these items, with higher scores indicating higher levels of pain interference with daily lives.

The third measure we used was the Patient-Reported Outcomes Measurement Information System (PROMIS) Fatigue Short Form created by Cella et al., (2007) in order to test the fatigue construct. The PROMIS Fatigue Short Form evaluates a range of self-reported symptoms, from "mild subjective feelings of tiredness to an overwhelming, debilitating, and sustained sense of exhaustion" ("Fatigue - A brief guide to the PROMIS Fatigue instruments"). The Fatigue Short Form contains items that analyzes a range of symptoms that decrease one's ability to execute daily activities. These items are then preferred to be scored using scoring tools through the Assessment Center Scoring Service due to accuracy (Cella et al., 2007). The higher the scores, the more indication that fatigue interfered with daily life.

Procedures

Lumley et al. (2017) conducted a clinical trial by recruiting patients with FM in the Wayne State University and The University of Michigan communities. In order to recruit participants, flyers were sent to various rheumatologists, advertisements were broadcasted in the community, announcements were posted to patient associations for FM, and informational workshops. Once the participants were signed up, they were contacted via telephone for a screening of their eligibility. Following the initial screening, the participants were then to attend an in-person screening where they were presented with written informed consent and a research staff member assessed that they indeed had FM. The research staff then assessed each participant's medical and psychological history. Exclusion criteria included any comorbid autoimmune disorders, serious medical illness, cognitive impairment, psychosis, suicidality, recent drug/alcohol dependence, pending (or received within the past 2 years) FM-related litigation or disability, non-English speaking, or judged by principle investigator as inappropriate for group participation.

Each patient completed 3 assessments that were conducted by blinded research assistants. Two weeks before randomization, the participants took the pretreatment assessment. Two weeks after session 8, the participants took the post treatment assessment. Finally, the follow-up assessment was taken 6 months after session 8. Each assessment was taken individually, on the computer, and in a supervised setting.

Data Analysis

To determine if LEAS hand scores improve the prediction of fibromyalgia pain and fatigue after controlling for sex, age, education, and negative affect we used multiple hierarchical regression in SPSS. We used two blocks to create two models to see if there was a significant change when adding LEAS score as a predictor. The first model was used to control for sex, age, and negative affect and the second model was the same four variables we started with, but we added LEAS hand scores as a predictor. We were using testing two variables, pain and fatigue, we had to run the regression test twice, once for each symptom.

RESULTS

The first hierarchical multiple regression was used to predict fatigue. At step 1, negative affect predicted fatigue ($\beta = .45$, $p < .001$), though the other control variables did not. At step 2, we added the three LEAS variables to the regression. The r-squared value did not increase substantially or significantly ($\Delta R2 = .01$, $p > .05$). Thus, the LEAS did not improve the prediction of fatigue.

The second hierarchical multiple regression was used to predict pain. At step 1, none of the control variables significantly predicted pain and the overall r-squared value was non-significant ($R2 = .20$, $p < .05$). At step 2, we again added the three LEAS variables. The r-squared value increased substantially and significantly ($\Delta R2 = .05$, $p < .05$). However, none of the LEAS variables had statistically significant beta-weights. Thus, while the LEAS improves prediction, it is not clear which aspect of the LEAS are responsible for this change.

When looking at the data that we analyzed with Hierarchical Multiple Regression using LEAS hand scores while controlling for age, sex, education, and negative affect, we can see that negative affect is the only variable that was significant in contribution to the predictability of FM fatigue (See Table 1). When looking at the data for FM fatigue, the only LEAS hand score variable that had a significant beta weight was the LEAS variable for Self at 0.058.

DISCUSSION

The purpose of this study was to identify if FM pain and fatigue symptoms were able to be better predicted based upon LEAS hand scores. Through our research, we have discovered that LEAS hand scores do indeed predict symptoms of pain and fatigue in fibromyalgia patients. Nonetheless, this is an imperative finding because according to Sallinen, Kukkurainen, Peltokallio, and Mikkelsson (2011), pain was tolerable for women with fibromyalgia, as long as fatigue symptoms were not as prominent. With the addition of fatigue, pain symptoms were intolerable. If we are able to accurately predict fibromyalgia fatigue symptoms in patients via LEAS hand scores, it could drastically benefit FM patient's pain by predicting the proper treatment early on.

Our research is imperative because it shows that LEAS hand scores improve the prediction of pain. This means that treatments could be given in advance to extreme pain conditions in fibromyalgia patients, helping them deal with how much pain influences their daily life. Future research in which we administer the LEAS to people with FM before they have much pain or fatigue, to determine if it predict pain and fatigue in the future, could also be imperative. Different treatment options, such as EAET, could be viable options for individuals who suffer with FM symptoms especially if LEAS predicts future pain and fatigue (Lumley et al., 2017). These results could also become more generalized and could help other patients who suffer with similar symptoms. Being able to predict FM pain through the use of LEAS hand scores could allow for physicians to predict pain perception ratings before they even occur. These predictions could lead to better quality life for these patients because they will receive proper and effective treatment.

Table 1
Hierarchical Multiple Regression of Fatigue

	Fatigue		Pain	
Predictor	Change in R-sq	β	Change in R-sq	β
Step 1	.22**		.20	
Sex		.01		-.01
Age		-.02		-.07
Negative Affect		.45**		.15
Education		-.08		-.06
Step 2	.01		.05*	
Sex		.00		-.04
Age		-.04		-.12
Negative Affect		.45*		.17
Education		-.06		-.01
LEAS Self		.06		-.27
LEAS Other		.12		.10
LEAS Total		-.22		-.00

* $p < 0.50$. ** $p < .001$.

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