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Original Research

Preference for Hedonic Goals in Fibromyalgia; Is It Always an Avoidance Mechanism? Looking the Relationship with Pain Acceptance from a Positive Psychology Perspective

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ABSTRACT

The aim of this study was to analyze the effect of openness to experience on pain acceptance through positive affect (PA) considering the moderating role of preference for mood management goals in women with fibromyalgia (FM). A cross-sectional study ($n = 231$) was carried out. A simple mediation model and a moderate mediation model were conducted by SPSS macro-PROCESS. Results showed that PA mediated positively the effect of openness to experience on acceptance ($B = 0.46$, $SE = 0.80$, $t = 5.59$; 95% $CI = [0.3016, 0.6298]$, $p < .001$) and that the contribution of openness to experience to PA varied at different values of mood management goals (medium: $-.04$; $\beta = .40$, $p < .001$; high: $.95$; $\beta = .61$, $p < .001$). Findings may serve as a foundation for tailored interventions to promote activity through acceptance focusing on PA and mood management goals among women with medium to high level of hedonic goals.

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Fibromyalgia (FM) is a disabling condition characterized by widespread musculoskeletal chronic pain and fatigue that involves complex pathophysiological mechanisms combined with social and psychological factors among other physical, affective, and cognitive dysfunctions, such as nonrestorative sleep, anxiety, depression, decreased attention, and memory problems (Arnold et al., 2016; Häuser et al., 2019.; Wolfe et al., 2016). To date, FM has presented a prevalence in different countries ranging between 0.2%–8.8%. The FM prevalence rate in women took values between 2.4%–6.8%. However, despite the prevalence rate in the male population differing according to the methodology of the studies (Dizner-Golab et al., 2023), the perception of FM as predominant ($\geq 90\%$) in women is supported by data from many studies (Wolfe et al., 2018). A high proportion of FM patients present a sedentary lifestyle (Segura-Jiménez et al., 2017), and high functional impact factors (Estévez-López et al., 2018) frequently associated with high levels of pain and fatigue (Bucourt et al., 2019; Sarzi-Puttini et al., 2020). Given the complexity of FM, in recent decades, the role that psychosocial variables can play in the prognosis and in the effects of treatments has been emphasized, pointing out the importance

of contemplating differential subgroups based on these variables (Luciano et al., 2016). Guided by this field of study, an emerging perspective in chronic pain adaptation involves the construct of pain acceptance as an important contextual mechanism to act in accordance with long-term goals and values in the presence of interfering pain and distress (McCracken et al., 2022; Nes et al., 2017). Patients with chronic pain who have pain acceptance show less distress in response to pain and are better able to bolster their positive emotions through sustained pursuit of valued activities despite their pain (McCracken et al., 2022). Based on a patient's acceptance of private experiences and the choice to mindfully acknowledge pain experiences (intensity, thoughts, emotions) patients tend to cease efforts to control them while engaging in value-guided action (Esteve et al., 2016). Pain acceptance has predicted greater levels of physical functioning and positive affect (PA) (Nes et al., 2017) and it could also be influenced by other cognitive and emotional processes such as personality traits, coping responses, positive emotions, and goal preferences. For example, Corbett et al. (2007) found that pain acceptance fluctuations described by patients depended on their position in the hope-despair cycle. Thus, pain acceptance appears to retain cognitive resources that could be flexibly applied to identify more effective pain coping responses, making pain acceptance not simply a stable trait, but instead, something that reflects processes that may wax and wane at

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various times (McCracken et al., 2022). It would be worthwhile to consider whether, or under which circumstances, pain acceptance could be influenced by factors that may increase flexibility, such as goal preferences or positive affect (Écija et al., 2020; Gilpin et al., 2017, 2019).

Regarding competing goals in the adjustment to FM (Thieme et al., 2017), these involve a self-regulation drive from motivational perspectives and have been related to psychological variables such as personality traits, pain-related beliefs, affect, and behavior patterns (Écija et al., 2020; Ecija et al., 2021). According to the fear-avoidance model (Vlaeyen et al., 2016), when patients anticipate pain through physical activity, they tend to avoid activity in order to prevent pain (Nijs et al., 2013; Vlaeyen et al., 2016). Under these circumstances, patients are faced with multiple competing goals, and they should prioritize between those related to avoiding pain and those related to maintaining or incorporating other goals not related to pain control (Crombez et al., 2012; Meulders, 2019; Tabor et al., 2020; van Damme et al., 2016). Thus, a preference for competing goals arises as a relevant factor in undertaking and maintaining functioning in patients with FM, not only from a motivational perspective but also from the perspective of contextual models. In the model of psychological flexibility (McCracken et al., 2022), goals have been analyzed in relation to, for example, cognitive flexibility or pain acceptance as factors that may explain different profiles of patients with FM (Karsdorp & Vlaeyen, 2011; Pastor-Mira et al., 2022; Velasco et al., 2022).

From the Motivational Affective Model (MAI), studies have shown a significant influence of affectivity in goal preference (Karsdorp & Vlaeyen, 2011), although relationships have not always been clearly established (Pastor-Mira et al., 2019; Peñacoba et al., 2021). Furthermore, the study of affect has provided data of clinical interest in the management of chronic pain (Hassett & Finan, 2016; Sturgeon & Zautra, 2013; van Middendorp et al., 2008). Specifically, based on the broaden-and-build theory of positive emotion (Fredrickson, 2001), positive affect can complement goal regulation models by amplifying a more diverse set of goal management strategies (Amtmann et al., 2018; Conversano et al., 2018; Galvez-Sanchez et al., 2018), and can be positively associated with goal pursuit, flexible goal adjustment, and goal reengagement (van Damme et al., 2016). The perception of available alternatives promoted by positive affect can facilitate disengagement from unattainable goals and reengagement with new goals, broadening attention to other stimuli, thoughts, and opportunities, facilitating the ability to think creatively and flexibly (Fredrickson, 2001). However, positive affect may not only be an antecedent of goal management strategies but may also result from the specific strategy employed (van Damme et al., 2016) and/or from the ensuing functioning (Esteve et al., 2016). Based on these results, it may be interesting to analyze whether positive affect, influenced by goal preferences, may predict higher levels of other positive variables related to higher flexibility in chronic pain, such as pain acceptance (Nes et al., 2017; Esteve et al., 2016).

Finally, openness to experience as a personality trait has been evaluated in FM populations (Bucourt et al., 2017), although it has been relegated in relation to negative variables (i.e., neuroticism). Openness to experience describes the depth and complexity of patients' mental and experiential life. According to the Five-Factor Model (Costa & McCrae, 1992), patients with low levels of openness to experience prefer strict routines and experience difficulties adapting to the changes requested in their lives. An interesting result has shown that this dimension presents a reverse relationship with depressive mood, without being associated to fear-avoidance (Pereira-Morales et al., 2018). In this sense, openness to experience seems to be related to the emotional state of the patients. Following these results, and because patients with increased

psychological flexibility, who are open and engaged, reach more positive outcomes because of their decentering and committed behavior (McCracken et al., 2022), openness to experience may surely deserve further attention in chronic pain patients. In chronic pain patients, its interaction with mood (in this case, with positive affect) and factors related to more psychological flexibility, such as goals and pain acceptance, could be observed.

To date, no studies have attempted to put these variables together. On the one hand, most chronic pain studies predominantly considered personality traits to be risk factors (i.e., neuroticism) with healthy personality studies being a minority. On the other hand, although positive affect has been recognized as a protective factor in chronic pain, the relation that positive affect may have with openness to experience and pain acceptance has not been explored. Finally, little is known about the role that patients' goal preferences could have in relation to positive variables described and, specifically, if levels of hedonic goals could influence the effect of openness to experience on pain acceptance through positive affect.

Specific Aims

Focusing on mediation and moderation analysis to better understand the predictors of pain acceptance (Gilpin et al., 2019), the aim of this study was to analyze the effect of openness to experience on pain acceptance through positive affect, taking into consideration the moderating role of mood management goals in women with FM (Fig. 1). This study may be of interest to health care professionals who design and carry out specific interventions focused on PA and goals in women diagnosed with FM, with the aim of living more successfully despite pain, through better acceptance and psychological flexibility (Dwarswaard et al., 2016).

Method

Design

A cross-sectional, observational study was carried out. All participants signed an informed consent form to take part in the project that was first approved by the Bioethics Committee of Rey Juan Carlos University [Reference number PI17/00858]. This paper follows the STROBE statement, according to the guidelines for observational studies (<http://strobe-statement.org>).

Participants

Based on prevalence studies (Dizner-Golab et al., 2023; Marques et al., 2017; Wolfe et al., 2018), a total of 268 women were recruited via email from different mutual aid FM associations in Spain (Madrid, Ciudad Real, Albacete, Guadalajara, and

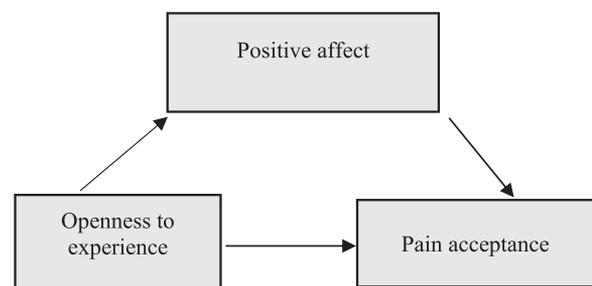


Figure 1. Hypothesized model of the moderated mediated effect of open to experience on pain acceptance by positive affect at different levels of mood management goals

Toledo) in which FM diagnosis according to the American College of Rheumatology (ACR) criteria (Wolfe et al., 1990; Wolfe et al., 2010) was a mandatory requirement for being part of the association. Once participants had given informed consent to take part in the project, they were contacted by phone and an appointment was made to participate in this study between January 2018–December 2018. In addition to the diagnosis, inclusion criteria for this study included female gender and being 18 years of age or older. The participation rate was 86%. The main reasons for non-participation were the following: not having time to attend the appointment ($n = 13$), having pain or fatigue on the day of the appointment ($n = 12$), and negative experiences with previous research studies ($n = 9$). Finally, 231 women with fibromyalgia were evaluated in a single session. Patients were informed that they would not receive financial compensation for their participation. After signing the informed consent, a booklet of questionnaires, expected to take approximately 45 minutes to complete, was given to each participant. Assessments were carried out in groups of six patients who completed the questionnaires in face-to-face sessions in the association (locality) where the women resided. Once completed, the researcher reviewed the protocols, and, in the case of missing data, explained to the women the meaning of the misunderstood item to be completed.

Following the established criteria for regression analyses (Westland, 2010) and the recommendations for moderation analyses using the macro-Process in SPSS Statistics (Galindo-Domínguez, 2021), a minimum n was established at 200.

Measures

Sociodemographic and clinical data

An ad hoc questionnaire that included age, marital status, educational level, pain intensity, and years of diagnosis of the disease was added to the booklet of questionnaires.

Specific variables of study

Pain Severity. Pain severity was assessed by The Brief Pain Inventory (BPI) (Cleeland & Ryan, 1994). It has been widely used in pain literature (Jensen et al., 1996) and contains four items that assess the maximum, minimum, and average pain (during the last seven days) and the current pain. Each item was evaluated using an 11-point numerical scale from zero = “no pain”–10 “the worst pain you can imagine”. In this study, internal consistency was high (Cronbach’s $\alpha = .86$).

Mood Management Goals: Preference for “mood management goals” and, specifically, the use of hedonic goals above the usual day-to-day duties, was assessed using an adaptation of the Spanish version (Pastor-Mira et al., 2019; Peñacoba et al., 2021) of the Goal Pursuit Questionnaire (GPQ) (Karsdorp & Vlaeyen, 2011). The GPQ shows a two-factor structure: “pain-fatigue avoidance goal” and “mood-management goal”. Higher mean scores in each factor indicate stronger preferences for a hedonic goal in comparison to an achievement goal; that is, to avoid fatigue (Factor I) or to maintain positive mood (Factor II). For this study, the “mood management goals” factor was selected. It contains six items, in a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree), in which, following the original instructions, participants must imagine “as vividly as possible” different situations in which they must rate their agreement with a specific thought that shows preference for achievement or mood management goals in that specific situation (i.e. “...to decrease my boredom, rather than to organize clothes for laundry”, “...to write a nice message (e-mail or WhatsApp) reply, rather than to finish the task”). Cronbach’s alpha in this study was .81.

Pain Acceptance: We used the activity engagement subscale from the Chronic Pain Acceptance Questionnaire (CPAQ; García Campayo et al., 2008; McCracken et al., 2004). The activity engagement subscale assesses the acceptance of pain through carrying out life activities in a normal way even when pain is experienced. It contains 11 items rated on a 7-point Likert scale, with higher scores indicating greater pain acceptance (theoretically ranging from 0–66) (García Campayo et al., 2008; Vasilidou et al., 2018). Cronbach’s alpha in this study was .95.

Positive Affect: Positive affect was assessed by the corresponding scale of the Spanish version of the Positive and Negative Affect Scale (PANAS) (Watson et al., 1988). From the total 20 feelings included in the scale, ten of them evaluate feelings that reflect a level of pleasurable engagement with the environment (positive subscale), in a theoretical range of 0–40 (Sandín, 2003). Cronbach’s alpha in this study was .91.

Openness to Experience: The NEO Five-Factor Inventory (NEO-FFI) (Costa & McCrae, 1992), which assesses personality domains based on the Five Factor Model, was used to assess openness to experience. Openness to experience includes both structural and motivational aspects. Openness is seen in the breadth, depth, and permeability of consciousness, and in the recurrent need to enlarge and examine experience, so it includes aspects such as intellectual curiosity and creative imagination (Costa & McCrae, 1992). Each NEO-FFI personality domain (i.e., neuroticism, extraversion, agreeableness, openness, and conscientiousness) is assessed by the sum of the scores obtained on 12 items. The response to each item is provided on a 5-point Likert-type scale ranging from “strongly agree” to “strongly disagree”. In the present study, Cronbach’s alpha for openness to experience was .71.

Data Analysis

Data were analyzed by SPSS 27 (Windows). First, we conducted a descriptive analysis (mean and standard deviations) on continuous variables, including demographics, clinical data, and outcome variables. Frequencies and percentages were also performed on categorical demographic variables. Third, bivariate Pearson correlation analyses were performed to assess the direction and strength of relationships between openness to experience, mood management goals, pain acceptance, positive affect, and pain. Statistical significance was established at a p value of less than .05. Bivariate Pearson correlation analysis informed the subsequent mediation analysis to examine positive affect between openness to experience and pain acceptance (Fig. 2) using the SPSS macro-PROCESS (Model 4). To test this model, regression (to calculate statistics for specific paths) and bootstrapping (to generate a confidence interval [CI] for the mediation effects) analyses were used. To provide clearer regression coefficients, variables were centered before the analyses, subtracting the mean from the predictors to rescale them. This reveals the effect when the remaining predictors have a value of “0” (Iacobucci et al., 2017). Despite this analysis being useful in terms

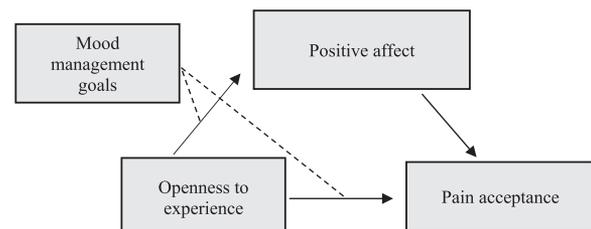


Figure 2. Hypothesized model of the mediated effect of open to experience on pain acceptance by positive affect

of interpretation, it creates “artificial” scores by rescaling the predictors. However, centering has no effect on model fit, significance tests, and standardized slope values. Finally, to test the main aim of this study, a moderated mediation analysis was run by model 7 of SPSS macro-PROCESS (Fig. 1). This model tests whether the indirect effect of openness to experience on pain acceptance, by way of positive affect, depended on the level of mood management goals. Product terms of openness to experience (centered) \times preference for mood management goals (centered) were added to the regression model predicting positive affect and pain acceptance. Simple slope analyses were performed to illustrate significant interaction effects (Aiken et al., 1991). The index of moderated mediation was estimated such as a measure of the association between an indirect effect and a moderator, together with a 95% CI, from bootstrapping 10,000 samples (Hayes, 2015). Pain was specifically considered as a significant covariate in each model, controlling also for sociodemographic and clinical covariates that were related to the variables of interest.

Results

Participant Characteristics

Patients had a mean age of 56.91 years ($SD = 8.9$) (ranging from age 30–78 years). Related to employment status, 22% were employed (all of them with part-time jobs and 10% on sick leave), 33.8% were homemakers, 32% were retired (18.8% reported chronic pain as a reason for retirement), and 12.1% were unemployed. More than half of the participants (53%) were married or in a stable relationship. Related to educational level, 52.6% of women had completed elementary school as their highest level of education (according to the International Standard Classification of Education (ISCED) (Schneider, 2013). The mean time since diagnosis was 12.14 years ($SD = 8.45$), ranging from 1–46 years. Finally, mean pain (BPI score) was 7.15 ($SD = 1.52$).

Descriptive Data and Correlations

Table 1 shows means, standard deviations, and Pearson correlations between outcome variables. Openness to experience was positively correlated with positive affect ($p < .001$) and pain acceptance ($p < .001$). Positive affect was positively correlated with pain acceptance ($p < .001$). Mood management goals was found to be positively correlated with positive affect ($p = .005$) and pain ($p < .001$). No significant correlations were found between mood management goals and both openness to experience and pain acceptance. No correlations among pain, openness to experience, positive affect, and pain acceptance were found.

Regarding the relationship of the outcome variables with the sociodemographic and clinical variables, we found that age was positively correlated to positive affect ($r = 0.201$; $p = .002$), pain acceptance ($r = 0.19$; $p = .004$), and mood management goals ($r = 0.35$; $p < .001$). Moreover, educational level (elementary school as the highest level of education according to the International Standard Classification of Education (ISCED, 2011) was negatively correlated to positive affect ($r = -0.23$; $p < .001$) and mood

management goals ($r = -0.20$; $p = .002$). Finally, years of diagnosis correlated negatively with pain acceptance ($r = -0.15$; $p = .01$) and mood management goals ($r = -0.31$; $p < .001$).

Test of the Models

Mediation model of openness to experience on pain acceptance by positive affect

The mediating role of positive affect between openness to experience and pain acceptance was examined with pain as covariate (Fig. 2). For the mediating model of positive affect, a total effect ($B = .45$, $SE = 0.11$, $t = 3.86$, $95\% \text{ CI} = [.2227, .6867]$, $p < .001$) of the predictor (openness to experience) on pain acceptance was observed. Positive affect mediated positively the effect of openness to experience on pain acceptance ($B = 0.46$, $SE = 0.80$, $t = 5.59$; $95\% \text{ CI} = [0.3016, 0.6298]$, $p < .001$). That is, openness to experience predicted higher positive affect, which, in turn, predicted higher pain acceptance. Results showed that the total amount of variance accounted by the overall model of positive affect was 42% ($F = 16.74$; $p < .001$). Finally, indirect effect of positive affect was also significant ($B = 0.19$, $SE = 0.06$; $95\% \text{ CI} = [0.0914, 0.3274]$).

Moderation mediation model of openness to experience on pain acceptance by positive affect at different levels of mood management goals

Building from the findings of the mediation model, the indirect effect of openness to experience on pain acceptance through positive affect moderated by mood management goals was examined (Fig. 1). Results showed that the contribution of openness to experience to positive affect varied at different values of mood management goals ($\beta = .003$ [$95\% \text{ CI} = -.0600/.0669$]).

Openness to experience was significantly associated with positive affect when levels of mood management goals was medium (value: $-.04$; $\beta = .40$, $p < .001$) and high (value: $.95$; $\beta = .61$, $p < .001$). The index of moderated mediation model of positive affect using Hayes' algorithm was estimated for pain acceptance ($\beta = .09$ [$95\% \text{ CI} = .0190/.1825$]). This result (Table 2, Fig. 1) showed that the strength of the relationship between openness to experience and pain acceptance by positive affect was increased at higher levels of mood management goals.

Discussion

The main aim of this study was to analyze the effect of openness to experience on pain acceptance through positive affect considering the moderating role of mood management goals in women with FM. This research falls within the line of recent studies where mediation and moderation models have been performed to analyze whether certain variables can indicate for whom, or under what circumstances, certain target variables may have a better effect, suggesting relevant contextual factors for treatment (Ećija et al., 2020; Gilpin et al., 2017, 2019). Our results show that the strength of the relationship between openness to experience and pain acceptance mediated by PA was increased at higher levels of mood management goals. Specifically, moderated mediated analysis shows that, in women with FM with medium and high

Table 1
Means, Standard Deviations, and Pearson Correlations Between Study Variables.

1. Openness to experience	37.54 (6.49)	0-60	-.06	.28 ^a	.25 ^a	-.11
2. Mood management goals	3.04 (1.03)	1-6		.18 ^a	.08	.23 ^a
3. Positive affect	30.87 (9.03)	0-40			.39 ^a	.03
4. Pain acceptance	18.93 (7.84)	0-66			.	.08
5. Pain	7.15 (1.52)	0-10				

^a $p < .01$.

Table 2
Moderate Mediation Model^a: Regression of Openness to Experience, Positive Affect (Mediator) on Pain Acceptance and Mood Management Goals (Moderator).

	B (SE)	T	P	[LLCI-ULCI]
VI: Openness to experience (OE)	.41(.08)	4.85	<.001	[.24 / .58]
M: Mood management goals (MMG)	1.57(.55)	2.84	.004	[.48 / 2.67]
OE x MMG (interaction)	.20(.08)	2.46	.01	[.04 / .36]
*Pain (covariate)	.24(.37)	.65	.51	[-.49/.99]
Conditional effects of the focal predictor (OE) at values* of the moderator (MMG) on positive affect				
-1.04	.20(.12)	1.58	.11	[-.04/.45]
-.04*	.40(.08)	4.70	<.001	[.23/.57]
.95*	.61(.11)	5.50	<.001	[.39/.83]
Regression of openness to experience and positive affect on pain acceptance				
	B (SE)	T	p	[LLCI-ULCI]
Openness to experience (OE)	.25(.11)	2.19	.02	[.02/.48]
Positive affect (PA)	.46(.08)	5.59	<.000	[.30/.62]
*Pain (covariate)	-.65(.47)	-1.38	.16	[-1.59/.27]
Model summary				
Indirect effects at values* of MMG	R ² : .42			
-1.04	.09(.07)			[-.02/.25]
-.04*	.19 (.05)			[.08/.32]
.95*	.28 (.07)			[.15/.44]
Indexes of moderated mediation				
Pairwise contrast between conditional indirect effects (Effect 1 minus Effect 2)				[.01/.17]
	Effect 1	Effect /2	contrast	[LLCI/ULCI]
	.19	.09	.09	[.01/.17]
	.28	.09	.19	[.03/.35]
	.28	.19	.09	[.01/.17]

^a Models include controls for age, sex, education level, and employment status; conditional effects of the focal predictor at values* of the moderator (MMG); and indirect effects of openness to experience (OE) on pain acceptance at values* of MMG.

BootLLCI = bootstrapping lower limit confidence interval; BootULCI = bootstrapping upper limit confidence interval; SE = standard error.

levels of mood management goals, openness to experience by the way of positive affect increases their levels of pain acceptance. These results are in line with a recent validation of the GPQ where positive affect was found to be related with hedonic goals only in the case of the mood-management goal subscale and not related to the fatigue-avoidance goal subscale (Peñacobá et al., 2021).

According to recent contextual studies in FM that have demonstrated that the relation between variables is not linear per se (Ecija et al., 2022; Esteve et al., 2016; Suso-Ribera et al., 2021), our results show a new complex model in which openness to experience and pain acceptance are affected by two additional variables: mood management goals and positive affect. The results show the contextual role of mood management goals related to the effect of openness to experience on pain acceptance in women with FM but, specifically, by the increase of positive affect. The Dynamic Model of Affect (Davis et al., 2004) already highlighted the important protective role of positive affect in chronic pain. This model suggests that PA seems to be a resilience mechanism that buffers against stress and negative emotions functioning as a resource for positive short-term outcomes in multiple life domains (Goubert & Trompeter, 2017; Hassett & Finan, 2016; Molinari et al., 2020). According to this, our study goes one step further and shows that openness to experience and PA may be resilience factors to increase pain acceptance for women with FM who prefer feeling positive emotions (that is, a preference for mood management goals). Although the possible protective role of openness to experience in chronic pain is less well known (Romeo et al., 2022; Seto et al., 2019), our results are in line with the approaches that indicate that openness to experience is related to the patients' emotional state, showing that patients with increased psychological flexibility, who were open and engaged, reached more positive outcomes because of their de-centering and committed behavior (McCracken et al., 2022). Similarly, several recent studies focused on determining the personality traits of patients with FM compared to other rheumatic diseases have shown that FM patients had higher scores on open-

ness than those with other rheumatic diseases taken as a whole (Bucourt et al., 2017, 2019). Specifically, a high openness score was associated with creativity and looking outwards, indicating that intellectual curiosity served as an ideal of success that could also be associated with a search for an explanation of the disorder or for alternative methods of managing pain (Bucourt et al., 2017). In relation to positive affect, our results could also be in accordance with studies that have suggested that PA might reduce engaging rigidly in specific action tendencies and create behavioral flexibility (Vlaeyen & Crombez, 2020), as well as enhance (continued) engagement in valued activities despite the experience of pain (Pastor-Mira et al., 2021).

Focusing on mood-management goals, our results have shown that the influence of openness to experience on pain acceptance is mediated by positive affect but, specifically, in women with medium or high levels of mood management goals. To our knowledge, there is no previous research addressing the role of preference for hedonic goals in patients with chronic pain from the perspective adopted in this study. To the best of our knowledge, there is only one recent study from Gonzalez et al. (2020) that has pointed out that the combination of psychopathological negative emotionality, interpersonal isolation, and low hedonic capacity in a group of patients with FM has implications for the daily living and treatment of those patients, explaining, as a conclusion, that core aspects of FM, such as hedonic goals, need to be addressed.

Moreover, in apparent contrast with our results, a higher tendency to have hedonic goals (but employed particularly to avoid symptoms) had been associated with less persistence, as goal pursuit theories state (Tosi, 1991). From fear-avoidance models, activity avoidance is associated with reinforcers (getting rid of pain through activity avoidance) and, thus, with preference for hedonic goals.

Preference for pain-avoidance goals (and thus, indirectly, preference for hedonic goals) enhance pain-related fear that predicts avoidance of painful activities that, in turn, increase pain and dis-

ability (Adams & Turk, 2022; Crombez et al., 2012). In contrast with fear-avoidance models, our results show that medium and high levels of preference for mood management goals play a positive role related to the effect that openness to experience has on pain acceptance by positive affect. This apparent contradiction can be explained if we pay attention to the approach proposed in our research. The preference for hedonic goals has been evaluated independently of the avoidance of activity that may lead to pain. Our study assessed the tendency towards emotional regulation goals with the aims of feeling good and enjoyment, aimed at self-care. The approach adopted, therefore, falls within positive psychology (Ozbayrak & Sucuoglu, 2022) and that is why the role of emotional regulation goals has been studied within models that include protective variables in chronic pain, such as pain acceptance (Hassett & Finan, 2016; Pastor-Mira et al., 2022) and positive affect (De la Coba et al., 2018; Finan & Garland, 2015; van Middendorp et al., 2008). As has been pointed out, the positive psychology perspective is not very abundant in chronic pain or in FM (Braunwalder et al., 2022). Thus, far from being contradictory, the results found, in our opinion, are complementary. Precisely, from the current models of psychological flexibility in chronic pain (McCracken & Vowles, 2022), the adaptive or maladaptive roles of certain variables (in this case, the preference for mood management goals), far from being determined, depend on contextual variables (McCracken & Vowles, 2022; Vlaeyen et al., 2016). In our study, the results seem to indicate that the purpose underlying goal preference may be crucial. Thus, if the preference for hedonic goals is used as an aim to avoid the possible pain associated with an activity, this preference may be maladaptive from the perspective of the fear-avoidance models (Crombez et al., 2012). As an interesting finding, our results show significant positive correlations between pain and preference for mood management goals. However, if the preference for hedonic goals is used for the purpose of intentional self-care aimed at improving positive affect, our results indicate an improvement in pain acceptance, thus showing that said preference, in this context, is an adaptive strategy. The preference for pain-avoidance goals may evoke fear that predicts avoidance of pain activities in some contexts. Mood management goals may also have an interesting positive effect when variables are analyzed related to openness to experience, positive affect, and pain acceptance. These concepts have not been well-studied in women with FM.

In short, the objective of this study was focused on the analysis of pain acceptance, due to its recognized positive role in patients with FM (McCracken & Vowles, 2022), through models of positive psychology, which incorporated more known variables (i.e., positive affect) and less well-known ones (i.e., openness to experience), including the role of preference for mood management goals. Our results show that pain acceptance is influenced by each variable included in our model: openness to experience, positive affect, and mood management goals. This could be in line with studies that found that activity engagement described by patients depended on their position in the hope-despair cycle (Corbett et al., 2007), suggesting that acceptance could fluctuate depending on the context. Thus, pain acceptance may reflect a stable and time varying process that may wax and wane at various times under different circumstances (Hassett & Finan, 2016). At an applied level, these results emphasize the need for positive activity interventions (PAIs) that are based on simple cognitive and/or behavioral strategies that improve people's resources and demonstrate that positive activities can result in improvements in pain intensity, pain interference, and PA (Müller et al., 2016). Analyzing our results from the Broaden-and-Build model (Fredrickson, 2013) and from the Dynamic Model of Affect (Davis et al., 2004), we might hypothesize that the promotion of positive emotions derived from openness to experience,

moderated by the preference of hedonic goals as an objective in itself linked to self-care (and not to avoidance), may amplify attention to positive activities as a means of accepting pain, despite the presence of symptoms such as pain or fatigue. Thus, in addition to the fact that positive emotions may interfere with or dampen the downward spiral of negative feelings and disability (Finan & Garland, 2015), simultaneously positive emotions may support an upward spiral based on mood management goals that may promote engagement in positive activities guided by the maintenance of a positive mood.

Limitations

This study has some limitations. First, the cross-sectional design prevents the establishment of cause-effect relationships (López-Roig et al., 2022). Second, findings are based on women with FM, so more research is needed in men (even though FM in men is scarce) and in other populations with pain to explore whether the findings are generalizable. Moreover, sampling through pain associations may have introduced a sampling bias towards women that may not reflect typical presentations in secondary care settings. However, it should be borne in mind that mutual aid associations are very common among Spanish FM patients and similar clinical and sociodemographic characteristics in FM patients from different contexts (associations and hospitals) have been found (Pastor-Mira et al., 2015). Finally, even though several clinical and psychosocial factors potentially relevant for FM were investigated, the list is incomplete (Mahgoub et al., 2020).

However, taking all of the above into account and based on recent studies in which PA influences individual differences in FM symptoms and, ultimately, in overall functioning (i.e., mediator), this study may be another step towards finding evidence that explicitly acts on openness to experience, positive affect, and mood management goals with the aim of promoting pain acceptance as it constitutes a key variable in chronic pain interventions that could fulfill a comprehensive role for the quality of life of patients (Dwarswaard et al., 2016).

Implication for Practice

Our results are in line with a new area of intervention focused on positive psychology in chronic pain populations aiming to increase positive feelings, cognitions, and behaviors (Braunwalder et al., 2022). Positive psychology interventions (PPIs) represent a resource-oriented approach focusing on strengthening positive individual aspects that may prove beneficial in chronic pain treatment. The findings presented above suggest that the strength of the relationship between openness to experience and pain acceptance, mediated by PA, is increased at higher levels of mood management goals. Our results give health professionals new psychological indicators that could be useful in improving interdisciplinary interventions for this population. Given that an important component of contemporary multidisciplinary pain programs involves teaching and encouraging adaptive management skills, this study gives professionals, and specifically nurses, the opportunity to focus interventions in FM on pain acceptance, positive affect, and mood management goals rather than being overly focused on reducing pain symptoms. Nevertheless, more studies are needed to unequivocally establish the causal relationships between these variables.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study was approved by the Bioethics Committee of Rey Juan Carlos University (Reference PI17/00858).

Consent to Participate

Informed consent was obtained from all individual participants included in the study.

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Data-base Link

https://osf.io/h2g78/?view_only=3c696ed80cec46bd9bc4d908555c5bd3

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