Ansiedad y Estrés 28(3) (2022) 179-185

Ansiedad y Estrés

https://www.ansiedadyestres.es

Original

Self-efficacy and commitment as psychological resources to adherence to walking despite chronic pain. A study on women with fibromyalgia

Catala, Patricia; Gutierrez, Lorena; Ecija, Carmen; Peñacoba, Cecilia.

University Professor. PhD, Psychology. Department of Psychology. Rey Juan Carlos University. Avda. de Atenas s/n. 28922. Alcorcón (Madrid). Spain.

ARTICLE INFO

Article history:
Received 14 August 2022
Accepted 11 November 2022
Available online 13 December 2022

Keywords:
Pain
Self-efficacy
Commitment to physical exercise
Fibromyalgia
Walking

A B S T R A C T

Background: Personal resources are key in adherence to treatment in patients with chronic pain. The aim of this study was to analyze the mediating effect of self-efficacy and commitment to physical exercise between the severity of pain and the number of times a week the patient has gone for a fast walk for at least 30 minutes with the aim of doing physical exercise, in women with fibromyalgia.
Method: A total of 264 women with fibromyalgia participated in the study. The mean age was 56.99 years (SD = 10.35). Pain intensity, self-efficacy to cope with chronic pain, commitment to physical exercise and the number of times a week that the patient walked for at least 30 minutes with the goal of physical exercise were evaluated. For data analysis, the serial multiple mediator model of the macro Process for SPSS 22 was used.
Results: A lower perception of pain was associated with a higher perception of self-efficacy, a higher perception of self-efficacy was associated with a greater commitment to physical exercise, and a higher commitment was associated with a greater number of times a week that they walked (B = -.34; SE = .20; 95% CI = [-0.83, -0.03]). A total effect (B = -1.04, SE = .38, t = -2.78, 95% I = [-1.81, -.78], p = .01) of the predictors on the described behavior pattern was observed.
Conclusion: Self-efficacy and commitment to the physical exercise mediate the relationship between pain intensity and the described walking pattern. The results of the serial mediation indicate that self-efficacy is an essential variable for the performance of commitment to the physical exercise in the relationship between pain intensity and walking.

La autoeficacia y el compromiso como recursos psicológicos para la adherencia a caminar a pesar del dolor crónico. Un estudio en mujeres con fibromialgia

Palabras clave:
Dolor
Autoeficacia
Compromiso con el ejercicio físico
Fibromialgia
Caminar

R E S U M E N

Antecedentes: Los recursos personales constituyen variables clave en la adherencia al tratamiento en pacientes con dolor crónico. El objetivo del presente trabajo es analizar, en mujeres con fibromialgia, el efecto mediador tanto de la autoeficacia como del compromiso con el ejercicio físico entre la intensidad del dolor y el número de veces a la semana que el paciente ha llevado a cabo la pauta de caminar durante al menos 30 minutos con el objetivo de hacer ejercicio físico.
Método: 264 mujeres con fibromialgia, con una edad media de 56.99 años (DT = 10.35) participaron en el estudio. Se empleó un diseño pre-post con un intervalo de una semana. En el primer momento temporal se procedió a la valoración de la intensidad del dolor, la autoeficacia en el afrontamiento del dolor crónico y el compromiso con el ejercicio físico. En la medida post, se evaluó el número de veces que la paciente había caminado al menos 30 minutos con el objetivo de realizar ejercicio físico. Para el análisis de los datos se utilizó el modelo de mediadores múltiples en serie empleando la Macro Process para SPSS 22.

* Corresponding author
E-mail address: cecilia.penacoba@urjc.es (C. Peñacoba).

https://doi.org/10.5093/anyes2022a21

Resultados: Una menor percepción de dolor se asocia con una mayor percepción de autoeficacia, una mayor percepción de autoeficacia se asocia con un mayor compromiso con el ejercicio físico, y un mayor compromiso se asocia con un mayor número de veces a la semana caminando (B = -.34; SE = .20; 95% IC = [-0.83, -0.03]). Se observa un efecto total (B = -1.04, SE = .38, t = -2.78, 95% I = [-1.81, -.78], p = .01) de los predictores sobre el número de veces que se camina.
Conclusión: La autoeficacia y el compromiso con el ejercicio físico median la relación entre la intensidad del dolor y la conducta de caminar. Los resultados de la mediación serial indican que la autoeficacia es una variable esencial para el efecto del compromiso con el ejercicio físico en la relación entre la intensidad de dolor y la adherencia a caminar.

Introduction

The clinical importance of physical exercise to carry out an active lifestyle in patients with chronic pain has been underlined in recent years (Nijs et al., 2020; Santos E Campos et al., 2020). Different forms of physical exercise have shown benefits in patients with fibromyalgia, helping to restore the neurochemical balance of the body and promoting a positive emotional state (Sosa-Reina et al., 2017). A recent review (O'Dwyer et al., 2019) on physical activity in adults with fibromyalgia highlights their positive benefits on associated symptoms and physical function. The European Alliance of Associations for Rheumatology (EULAR) recommended non-pharmacological therapies for the initial management of fibromyalgia, being physical exercise the treatment of choice integrated into individualized care plans (Macfarlane et al., 2017). It have been observed that regular exercise can help reduce anxiety, stress, and depression (Macfarlane et al., 2017) and improves well-being in patients with fibromyalgia (López-Pousa et al., 2015).

Physical exercise is characterized by planned, structured and repetitive physical activities with the aim of maintaining or improving physical fitness (Thivel et al., 2018). Going for a walk has been established as a safe, inexpensive, and effective way to manage chronic intractable pain (O'Connor et al., 2015; Senba & Kami, 2017). Specifically, this symptom (pain) has been considered inherent in fibromyalgia (Wolfe et al., 2018). However, different investigations have shown the low adherence of these patients to walking (López-Roig et al., 2016; Sanz-Baños et al., 2018). The high prevalence of beliefs related to pain seem to be the main inhibitor of walking (Peñacoba et al., 2017; Sanz et al., 2016; Slade et al., 2014).

One of the most relevant cognitive components in this context is the belief of self-efficacy (Sánchez et al., 2011; Soriano-Maldonado et al., 2015). The study of the theory of self-efficacy was introduced by Bandura and refers to the beliefs that a person has about their capacity and self-regulation to be able to start a behavior (Bandura, 1997). That is, if a person believes they can provoke an event (e.g. going for a walk), they can carry out a more active and self-determined lifestyle. This sense of control could facilitate behavior change. Different studies in cardiovascular disease show how patients with higher levels of self-efficacy are more likely to incorporate physical exercise into their routines (Caetano et al., 2020; Schwarzer et al., 2008). For patients with fibromyalgia in particular, exercise self-efficacy along with perceived barriers and intention to exercise have been shown as predictive variables for increasing physical activity (Kaleth et al., 2022).

Traditionally, this belief-modifying approach to behavior change in health has proven useful to some extent (Michie et al., 2018), since the studies carried out on the maintenance of this behavior suggest that alternatives are needed (Kwasnicka et al., 2016; Zhang et al., 2018). One of the most important and growing approaches is the context-based approach to Acceptance and Commitment Therapy (ACT) (Hayes et al., 1999). It pays special attention to the role of patient values in maintaining a healthy lifestyle. Values are defined as immediate qualities chosen from ongoing action patterns that are verbally established as reinforcing (Hayes et al., 1999; Hayes et al., 2016). That is, they motivate patients to act in one way or another because they are part of their belief system, express their interests and determine their behaviors. It is known that values increase the persistence of the task in multiple behaviors related to health, such as going for a walk (Jackson et al., 2016; Zhang et al., 2018).

Thus, previous literature indicates the importance of considering the factors related to cognitive behavior modification (Jalali et al., 2019) and confirms that the severity of pain is not the only factor that explains the (in) activity of patients with fibromyalgia (Pastor-Mira et al., 2020). Therefore, it could be considered that the possession of cognitive resources could be related to a change in behavior towards a more active lifestyle and if, in addition to having cognitive resources, the patients present health-related values, they could maintain these behaviors over time. Therefore, the aim of this study has been to explore the mediating role of self-efficacy and commitment to physical exercise acting in series between the severity of pain and the number of times a week that the patient has gone out for a walk for at least 30 minutes with the aim of doing physical exercise. It is hypothesized that both factors (self-efficacy is expected to influence commitment) mediate the relationship between pain and the weekly frequency with which patients go for a walk.

Method

Participants

We selected a sample of convenience by contacting several patient associations from different Spanish regions during 2019. In total, 268 participants volunteered to participate in the study. Finally, effective responses were obtained from 264 women with fibromyalgia. The mean age of the participants was 56.99 years (SD = 10.35). Six percent of the women had completed university studies, 26.6% secondary school, 51.3% primary education, and 15.6% could read and write. Most of the women were married or in a stable relationship (78.1%). Six percent of the women were single and 15.9% of them were divorced or widowed. The vast majority of the participants were housewives (78%). Participants had a diagnosis of fibromyalgia for an average of 13.02 years (SD = 7.21, range 1 to 46 years).

Design

A prospective design was used for the study. Measurements were taken at two times. At first, pain, self-efficacy and commitment to physical exercise were measured and seven days later the number of times a week they walked for 30 minutes or more with the aim of doing physical exercise was recorded.

Instruments

First measurement

Pain severity

The pain severity score was obtained by averaging the maximum, minimum and overall pain severity during the last 7 days, together with the pain severity rating at the time of assessment (Jensen et al., 1996). All these measures were rated with an 11-point numerical rating scale (0 = "no pain" and 10 = "the worst pain you can imagine") (Jensen et al., 1996, 1999). The internal consistency of the four items in this sample was .91.

Self-efficacy

The Self-efficacy Questionnaire in Chronic Pain was used (Martín-Aragón et al., 1999). Only the total score was used, obtained from the sum of the responses to the 19 items that make up the questionnaire. It is answered with a Likert-type response scale from 0 (I feel fully incapable) to 10 (I feel fully capable). The patient must answer the degree to which they consider themselves capable of performing certain activities or managing their pain, their emotional problems or other symptoms associated with chronic pain. High scores indicate a high perception of self-efficacy. Cronbach alpha was .89.

Commitment to physical exercise

An ad hoc item was administered. In the first place, it is clarified what the term physical exercise refers to, understood as a variety of planned, structured repetitive physical activity and carried out with an objective related to the improvement or maintenance of physical form. Next, the patients answer a question related to the degree of commitment to physical exercise (i.e., to what extent do they feel committed to practicing physical exercise?) on a 10-point Likert scale (1 = none to 10 = maximum).

Second measurement

Walking pattern

An ad hoc item was administered. The patients respond to a question related to the walking pattern suggested in the psychoeducational talk given (i.e., how many times have you walked for at least 30 minutes with the aim of doing physical exercise during the last 7 days?).

Procedure

All participants in this study have been diagnosed with fibromyalgia according to the criteria of the American College of Rheumatology (Wolfe et al., 1990, 2010, 2016). Our inclusion criteria also considered: being a woman (to ensure homogeneity because almost all FM patients are women), being over 18 years of age, having a medical prescription to walk and not presenting physical comorbidity that would prevent them from doing so, and having the physical and mental capacity to give informed consent and complete the surveys. Once the participants gave their informed consent to participate in the study, they were given a questionnaire that took approximately 20 minutes to complete. Once the evaluation is completed, the participants were encouraged to walk for at least 30 minutes and they were asked to write down the times they walked, according to the established pattern, in the next 7 days. The patients were scheduled for a second assessment eight days after the first assessment. In this second evaluation, patients were asked for the number of times they had walked according the established pattern during the last 7 days. The study followed the ethical principles for research with human participants and was approved by the Ethics Committee of the Rey Juan Carlos University on 06/09/2016; (reference number 160520165916; PI17 / 00858).

Statistical analysis

The analyses were performed with the SPSS 22 statistical package (IBM Corp. & IBM Corp, 2017). First, descriptive analysis, internal consistency analysis (Cronbach's alpha coefficients) and Pearson correlations were performed. For continuous variables, means, standard deviations and range medians were used, while categorical data were presented as numbers and percentages. The level of statistical significance for all tests was established at a p value of less than 0.05.

For the serial multiple mediation analysis (SMM; mediation of several mediators going one after another), SPSS macro PROCESS (model 6) was used, applying two significant mediators. As recommended by Hayes (Hayes, 2013), the regression / trajectory coefficients are all in non-standardized form since the standardized coefficients generally do not have a useful substantive interpretation.

Two models were tested. The tested models included pain severity as a predictor (X) and the number of times a week that walked for 30 minutes or more with the goal of doing physical exercise as outcome (Y). Self-efficacy and commitment to activity were included as mediators. In the model 1, self-efficacy (M1) and commitment to activity (M2), and in the model 2, commitment to activity (M1) and self-efficacy (M2). The model fit was also examined using the following criteria: a chi-square / df of <= 2, a p-value of > 0.05, a comparative fit index of > = 0.95, and an approximation of the mean squared error of <0.06 (Hu & Bentler, 1999).

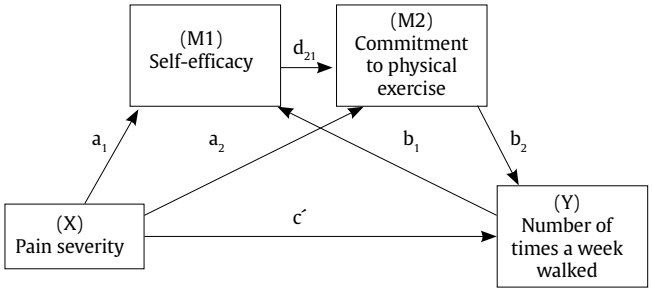

Figure 1. Path diagram illustrating direct effects and causal paths linking pain severity with the number of times a week they walked for 30 minutes or more with the aim of doing physical exercise.

Results

Means, standard deviations, minimum, maximun and Pearson's correlations between variables.

Table 1 shows the frequencies in relation to the number of times walked according to the established pattern. It can be seen that the highest percentages (around 13%) are observed in frequencies between one and three times per week. Approximately 20% of the patients did not walk according to the established pattern even once.

Table 2.
Means, standard deviations, and Pearson correlations between study variables

	Mean (SD)	Min., Max.	2	3	4
1. Pain severity	7.40 (1.80)	1, 10	-.28**	-.24**	-.31***
2. Self-efficacy	85.92 (33.56)	2, 160		.42***	.32***
3. Commitment to physical exercise	6.47 (2.83)	1, 10			.25**
4. Walk according to the guideline (number of times)	1.11 (2.13)	0, 21			

*** $p < .001$, ** $p < .01$, * $p < .05$.

Table 1.

Walk according to the established pattern (percentages and frequencies)

Number of times a week that you perform the mentioned walking pattern	% (n)
Did not do it at all	19.3% (n=51)
Did it once	14.4% (n=38)
Twice times	12,1% (n=32)
Three times	12.9% (n=34)
Four times	9.1% (n=24)
Five times	12.5% (n=33)
Six times	6.8% (n=18)
Seven times	9.5% (n=25)
More than seven times	3.4% (n=9)

Table 2 shows the means, standard deviations and Pearson's correlations between variables. The results show significant negative relationships between pain severity and self-efficacy, commitment to physical exercise and the number of times a week they walked for 30 minutes or more with the aim of doing physical exercise (all $p <$ .05). In addition, significant positive relationships were observed for the number of times a week walked for 30 minutes or more with the aim of doing physical exercise with self-efficacy and commitment to physical exercise (all $p < .05$). Self-efficacy and commitment to activity were also positively and significantly correlated ($p < .05$). In general, it can be seen that the bivariate associations contribute independently to 8%-10% of explained variance. The highest percentage of variance (18%) is observed in the association between self-efficacy and commitment to physical activity.

Effect of pain severity on the number of times a week that patients walk 30 minutes or more in order to perform physical exercise through self-efficacy and commitment to physical exercise.

Since two mediators were used, two different causal models were produced: SMM 1 (self-efficacy-commitment to physical exercise) and SMM 2 (commitment to exercise-self-efficacy). The two models were compared in terms of the significant pathway created by each different causal order of mediators.

Only the indirect SMM1 route was significant (Figure 1). A total effect (B = -1.04, SE = .38, t = -2.78, 95% I = [-1.81, -.78], p = .01) of the predictor was observed in the number of times a week that they walked 30 minutes or more with the aim of doing physical exercise. In addition, there was a significant indirect effect of the perception of pain in the number of times that the patients performed the behavior pattern described through self-efficacy and commitment to physical exercise (B = -.34; SE = .20; 95% CI = [- .83, -.03]) (Figure 2). That is, a lower perception of pain predicted greater self-efficacy, which predicted a greater commitment to activity, which, in turn, predicted a greater number of times a week that they walked fast 30 minutes or more with the goal of doing physical exercise. There was also a significant simple indirect effect of the perception of pain on the number of times a week that they walked 30 minutes or more with the objective of doing physical exercise through self-efficacy (B = -.14; SE = .06 ; 95% CI = [- .22, -.01]). In contrast, no mediating effect was observed through commitment to activity (B = -.12, SE = .09, 95% CI = [- .29, .02]). Figure 2 provides additional details on this analysis. The contrast test did not show significant differences between the indirect effects compared. In general, the effect of pain on the number of times a week that they walked for 30 minutes or more with the aim of doing physical exercise in the model that represents the two mediators explained 11% of the variance ($R^2 = .11$; $p = .01$).

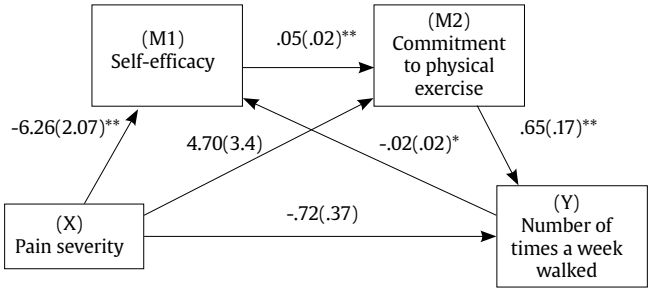

Figure 2. Path diagram illustrating direct effects and causal paths linking pain severity with the number of times a week they walked for 30 minutes or more with the aim of doing physical exercise.

Notes: Multiple mediation analysis in series with the number of times a week they walked for 30 minutes or more with the aim of doing physical exercise as dependent variable, pain severity as independent variable and self-efficacy and commitment to physical exercise as first and second mediators. Values are non-standardized regression coefficients (SE in parentheses) and associated p values (* p <.05, ** p <.01, *** p <.001). Association in brackets = direct effect (controlling for effects indirect). Solid lines indicate important pathways and dashed lines indicate non-significant pathways.

Discussion

The main objective of this research was to elucidate the associations between pain severity, self-efficacy, commitment to physical exercise and the weekly frequency of going for a walk for at least 30 minutes with the aim of doing physical exercise in women with fibromyalgia. According to the proposed hypothesis, the results showed a significant indirect effect of the severity of pain with the number of times a week that patients go for a walk for at least 30 minutes with the aim of doing physical exercise, mediated by self-efficacy and commitment to physical exercise. That is, a lower perception of the severity of pain, predicted higher scores of self-efficacy, which predicted a greater commitment to physical exercise, which, in turn, predicted a greater number of times a week that patients walked at least 30 minutes with the goal of doing physical exercise. To our knowledge, no studies have been carried out that analyze the relationship between self-efficacy and commitment as variables involved in adherence to the walking pattern, taking into account pain intensity as

the main inhibitor. However, in other populations such as cardiovascular patients, it has been observed that patients who have positive beliefs about their ability to carry out physical exercise and manage pain, feel more committed to this decision and are more inclined to do so (Caetano et al., 2020; Schwarzer et al., 2008).

These results confirm what is proposed by the ACT context-based approach (Hayes et al., 1999) using the Relational Frame Theory (RFT) (Hayes et al., 2003) as a theoretical basis, which points to the language we use as a central component of human psychology and as part of psychological flexibility, committed action, which assumes the role of expanding the valued responses of an individual in increasingly broad patterns of activity (Zhang et al., 2018). These behavior patterns correspond to ingrained values that are fundamental for the successful maintenance of behavior towards a healthy lifestyle (Kwasnicka et al., 2016). Therefore, it could be argued that a self-language (to produce language ourselves) related to the perception of ability (e.g. "I am capable of managing my pain and doing physical exercise despite feeling it") is necessary to increase commitment and improve the maintenance of a style active life. This finding has important clinical implications, as it would allow fibromyalgia patients to lead active and healthy lifestyles despite pain.

An interesting result of our research is the fact that, in the proposed model, there is no direct relationship between pain severity and walking behavior. Although pain has been shown to be a predictor of walking behavior (López-Roig et al., 2016; Sanz-Baños et al., 2018), the relationship is not deterministic. Our results add that variables such as self-efficacy and commitment to physical exercise play a fundamental role in regulating pain intensity to carry out adherence to walking behavior in these patients, given its benefits (Pastor-Mira et al., 2020) and low adherence (Sanz-Baños et al., 2018). This result is consistent with what was found by Van Liew et al. (2019) who suggest that the effects of age and symptom duration on FMS are unique, and that self-efficacy plays a crucial role in moderating disease course.

The simple indirect effect of pain severity on the number of times during the week that the aforementioned walking pattern was carried out was significant through self-efficacy. Previous research has shown that higher self-efficacy is associated with less pain and less impairment on the physical activities after controlling for demographic and disease severity (Buckelew et al., 1995). A previous qualitative interview study already pointed out that lack of adherence to walking in patients with chronic pain could be related to low self-efficacy (Karlsson et al., 2018). In this sense, one of the contributions of our research is to analyze the known relationship between self-efficacy and physical exercise (walking), taking into account the presence of pain as the main limiting factor. Scioli-Salter et al. (2017), in a small sample of patients with fibromyalgia (n=71) showed the role of self-efficacy in exercise adoption and maintenance, even in the setting of higher FM symptoms.

Contrary to the simple effect indicated with respect to self-efficacy, it seems that the commitment to physical exercise alone does not have a significant mediating effect between the severity of pain and the number of times a week that patients walk for at least 30 minutes in order to do physical exercise. These results suggest that it is not being committed to health behavior by itself, but the perception of self-efficacy that may be an important marker in the relationship between the perception of pain and the frequency with which the patients carry out the described pattern. Although in other contexts (e.g. patients with cardiovascular disease) it has been observed that being committed to activity is related to greater adherence to physical exercise (Stonerock & Blumenthal, 2017), our results indicate that for patients with fibromyalgia this action of committing, without other resources such as self-efficacy, is not enough to average the relationship between the severity of pain and the number of times patients go for a walk for at least 30 minutes. In this context, previous research that analyzes the role of intention and self-efficacy in predicting physical activity in patients with fibromyalgia (n=61) also point out the need to include self-efficacy as a central predictor variable for intention to play a role in predicting physical activity (Culos-Reed et al., 2003). Therefore, it is considered interesting to carry out future research that provides new information on the role played by other cognitive resources (for example, cognitive defusion or acceptance), the different types of motivation or social commitment (feeling indebted to the health professional that attends) in the maintenance of healthy behaviors in patients with chronic pain.

There are several limitations to our study. First, self-report questionnaires are used, so they are subjective measures. This could affect the interpretation of the results, however, it is one of the most used assessment instruments in research on Health Psychology. This limitation is especially relevant in the case of walking behavior, where only the self-report has been used, so it is subject to response bias. It would be of interest for future studies to complete this information with accelerometers/pedometers; however, the wide variability with respect to behavior (and the very low values found) seems to indicate the absence of a significant social desirability bias. Second, since the results are based on women with FM (the most common sex in this condition), more research is needed in men and other populations with pain to see if the findings are generalizable. In addition, it is important to note that the study included two mediators in the relationship of pain intensity and the number of times a week that the aforementioned walking behavior is carried out, but the list is far from being complete and other psychosocial factors (e.g. cognitive defusion acceptance, motivation or social commitment) could also be investigated in future research.

Despite the above limitations, the findings presented have important clinical implications. It would be interesting to carry out intervention programs based on the improvement of the perception of self-efficacy about pain management and carrying out walking behaviors. In this sense, it has been observed that the modification of the self-referred language (going from "I am not capable" to "I feel capable of"), can favor these beliefs of self-efficacy. In addition, exploring and enhancing the degree of commitment to physical exercise of the patients would allow us to know carefully the probability that the patients adhere to active lifestyles. In this sense, new therapeutic approaches proposed in the last decade, such as Acceptance and Commitment Therapy (ACT), could be taken into consideration. One of the main elements of ACT is psychological flexibility, implying a series of interrelated competencies among which are included a stable sense of self (of the person) and compromise, clarification of the values that guide behavior, and committed and purposeful action towards them, among others (Hayes et al., 2016; Hayes et al., 2011). In this sense, in addition to the contributions that Cognitive Behavioral Therapy has made to the promotion of self-efficacy in chronic pain (Jalali et al., 2019), ACT treatment could be used not only with the general objective of acceptance of chronic illness, but also to prioritize values despite the difficulties of the disease, promoting commitment to really relevant activities.

Funding

This work was funded by the Health Research Fund (Fondo de Investigación en Salud, grant number PI17/00858) from the Insti-

tuto de Salud Carlos III (Spain), cofinanced by the European Union through the Fondo Europeo de Desarrollo Regional (FEDER).

References

Bandura, A. (1997). *Self-efficacy: The exercise of control.* Freeman.

Buckelew, S. P., Murray, S. E., Hewett, J. E., Johnson, J., & Huyser, B. (1995). Self-efficacy, pain, and physical activity among fibromyalgia subjects. Arthritis Care and Research : The Official Journal of the Arthritis Health Professions Association, 8(1), 43–50. https://doi.org/10.1002/art.1790080110

Caetano, L. C. G., Pacheco, B. D., Samora, G. A. R., Teixeira-Salmela, L. F., & Scianni, A. A. (2020). Self-Efficacy to Engage in Physical Exercise and Walking Ability Best Predicted Exercise Adherence after Stroke. *Stroke Research and Treatment, 2020,* 1–6. https://doi.org/10.1155/2020/2957623

Catala, P., Lopez-Roig, S., Ecija, C., Suso-Ribera, C., & Peñacoba Puente, C. (2020). Why do some people with severe chronic pain adhere to walking prescriptions whilst others won't? A cross-sectional study exploring clinical and psychosocial predictors in women with fibromyalgia. *Rheumatology International.* https://doi.org/10.1007/s00296-020-04719-w

Culos-Reed, S. N., & Brawley, L. R. (2003). Self-efficacy predicts physical activity in individuals with fibromyalgia. Journal of Applied Biobehavioral Research, 8(1), 27–41. https://doi.org/10.1111/j.1751-9861.2003.tb00083

Hayes, A. (2013). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach.* Guilford Press.

Hayes, S.C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy.* The Guilford Press.

Hayes, Steven C., Barnes-Holmes, D., & Roche, B. (2003). Behavior Analysis, Relational Frame Theory, and the Challenge of Human Language and Cognition: A Reply to the Commentaries on Relational Frame Theory: A Post-Skinnerian Account of Human Language and Cognition. *The Analysis of Verbal Behavior, 19*(1), 39–54. https://doi.org/10.1007/BF03392981

Hayes, Steven C., Luoma, J., Bond, F. W., Masuda, A., & Lillis, J. (2016). Acceptance and commitment therapy: Model, processes, and outcomes. *The Act in Context: The Canonical Papers of Steven C. Hayes*, 249–279. https://doi.org/10.4324/9781315745138

Hu, L., & Bentler, P. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternative. *Struct Equ Modeling, 6*(1), 1–55.

IBM Corp., & IBM Corp. (2017). *IBM SPSS Statistics for Windows, Version 22.0.* (No. 22). IBM Corp.

Jackson, M. L., Larry Williams, W., Hayes, S. C., Humphreys, T., Gauthier, B., & Westwood, R. (2016). Whatever gets your heart pumping: the impact of implicitly selected reinforcer-focused statements on exercise intensity. *Journal of Contextual Behavioral Science, 5*(1), 48–57. https://doi.org/10.1016/j.jcbs.2015.11.002

Jalali, Z. M., Farghadani, A., & Ejlali-Vardoogh, M. (2019). Effect of Cognitive-Behavioral Training on Pain Self-Efficacy, Self-Discovery, and Perception in Patients with Chronic Low-Back Pain: A Quasi-Experimental Study. *Anesthesiology and Pain Medicine, In Press*(In Press). https://doi.org/10.5812/aapm.78905

Jensen, M. P., Turner, J. A., Romano, J. M., & Fisher, L. D. (1999). Comparative reliability and validity of chronic pain intensity measures. *Pain, 83*(2), 157–162. https://doi.org/10.1016/S0304-3959(99)00101-3

Jensen, M. P., Turner, L. R., Turner, J. A., & Romano, J. M. (1996). The use of multiple-item scales for pain intensity measurement in chronic pain patients. *Pain, 67*(1), 35–40. https://doi.org/10.1016/0304-3959(96)03078-3

Kaleth, A. S., Bigatti, S. M., Slaven, J. E., Kelly, N., & Ang, D. C. (2022). Predictors of Physical Activity in Patients With Fibromyalgia: A Path Analysis. Journal of Clinical Rheumatology : Practical Reports on Rheumatic & Musculoskeletal Diseases, 28(1), e203–e209. https://doi.org/10.1097/RHU.0000000000001684

Karlsson, L., Gerdle, B., Takala, E.-P., Andersson, G., & Larsson, B. (2018). Experiences and attitudes about physical activity and exercise in patients with chronic pain: a qualitative interview study. *Journal of Pain Research, Volume 11,* 133–144. https://doi.org/10.2147/JPR.S149826

Kwasnicka, D., Dombrowski, S. U., White, M., & Sniehotta, F. (2016). Theoretical explanations for maintenance of behaviour change: a systematic review of behaviour theories. *Health Psychology Review, 10*(3), 277–296. https://doi.org/10.1080/17437199.2016.1151372

López-Pousa, S., Bassets Pagès, G., Monserrat-Vila, S., de Gracia Blanco, M., Hidalgo Colomé, J., & Garre-Olmo, J. (2015). Sense of Well-Being in Patients with Fibromyalgia: Aerobic Exercise Program in a Mature Forest—A Pilot Study. *Evidence-Based Complementary and Alternative Medicine, 2015*, 1–9. https://doi.org/10.1155/2015/614783

López-Roig, S., Pastor, M. A., Peñacoba, C., Lledó, A., Sanz, Y., & Velasco, F. (2016). Prevalence and predictors of unsupervised walking and physical activity in a community population of women with fibromyalgia. *Rheumatology International, 36*(8), 1127–1133.

Macfarlane, G. J., Kronisch, C., Dean, L. E., Atzeni, F., Häuser, W., Fluß, E., Choy, E., Kosek, E., Amris, K., Branco, J., Dincer, F., Leino-Arjas, P., Longley, K., McCarthy, G. M., Makri, S., Perrot, S., Sarzi-Puttini, P., Taylor, A., & Jones, G. T. (2017). EULAR revised recommendations for the management of fibromyalgia. *Annals of the Rheumatic Diseases, 76*(2), 318–328. https://doi.org/10.1136/annrheumdis-2016-209724

Martín-Aragón, M., Pastor, M. A., Rodríguez-Marín, J., March, M. J., Lledó, A., López-Roig, S., & Terol, M. C. (1999). Percepción de Autoeficacia en dolor crónico: Adaptación y Validación de la Chronic Pain Self efficacy Scale. *Revista de Psicología de La Salud, 11,* 53–75.

Michie, S., West, R., Sheals, K., & Godinho, C. A. (2018). Evaluating the effectiveness of behavior change techniques in health-related behavior: a scoping review of methods used. *Translational Behavioral Medicine, 8*(2), 212–224. https://doi.org/10.1093/tbm/ibx019

Nijs, J., D'Hondt, E., Clarys, P., Deliens, T., Polli, A., Malfliet, A., Coppieters, I., Willaert, W., Tumkaya Yilmaz, S., Elma, Ö., & Ickmans, K. (2020). Lifestyle and Chronic Pain across the Lifespan: An Inconvenient Truth? *PM&R, 12*(4), 410–419. https://doi.org/10.1002/pmrj.12244

O'Connor, S. R., Tully, M. A., Ryan, B., Bleakley, C. M., Baxter, G. D., Bradley, J. M., & McDonough, S. M. (2015). Walking Exercise for Chronic Musculoskeletal Pain: Systematic Review and Meta-Analysis. *Archives of Physical Medicine and Rehabilitation, 96*(4), 724-734.e3. https://doi.org/10.1016/j.apmr.2014.12.003

O'Dwyer, T., Maguire, S., Mockler, D., Durcan, L., & Wilson, F. (2019). Behaviour change interventions targeting physical activity in adults with fibromyalgia: a systematic review. *Rheumatology international, 39*(5), 805-817.

Pastor-Mira, M.-A., López-Roig, S., Peñacoba, C., Sanz-Baños, Y., Lledó, A., & Velasco, L. (2020). Predicting walking as exercise in women with fibromyalgia from the perspective of the theory of planned behavior. *Women & Health, 60*(4), 412–425. https://doi.org/10.1080/03630242.2019.1662869

Pastor-Mira, M. A., López-Roig, S., Martínez-Zaragoza, F., Lledó, A., Velasco, L., León, E., Écija Gallardo, C., & Peñacoba, C. (2020). Promoting unsupervised walking in women with fibromyalgia: a randomized controlled trial. *Psychology, Health & Medicine*, 1–12. https://doi.org/10.1080/13548506.2020.1774068

Peñacoba, C., Pastor, M. Á., López-Roig, S., Velasco, L., & Lledó, A. (2017). Walking Beliefs in Women With Fibromyalgia : Clinical Profile and Impact on Walking Behavior. *Clinical Nursing Research, 26*(5), 632–650. https://doi.org/10.1177/1054773816646339

Sánchez, A. I., Martínez, M. P., Miró, E., & Medina, A. (2011). Predictors of the Pain Perception and Self-Efficacy for Pain Control in Patients with Fibromyalgia. *The Spanish Journal of Psychology, 14*(1), 366–373. https://doi.org/10.5209/rev_SJOP.2011.v14.n1.33

Santos E Campos, M. A., Párraga-Montilla, J. A., Aragón-Vela, J., & Latorre-Román, P. A. (2020). Effects of a functional training program in patients with fibromyalgia: A 9-year prospective longitudinal cohort study. *Scandinavian Journal of Medicine & Science in Sports, 30*(5), 904–913. https://doi.org/10.1111/sms.13640

Sanz-Baños, Y., Pastor-Mira, M.-Á., Lledó, A., López-Roig, S., Peñacoba, C., & Sánchez-Meca, J. (2018). Do women with fibromyalgia adhere to walking for exercise programs to improve their health? Systematic review and meta-analysis. *Disability and Rehabilitation, 40*(21), 2475–2487. https://doi.org/10.1080/09638288.2017.1347722

Sanz, Y., Pastor, M. Á., Velasco, L., López-Roig, S., Peñacoba, C., Lledó, A., & Rodríguez, C. (2016). To walk or not to walk: insights from a qualitative description study with women suffering from fibromyalgia. *Rheumatology International, 36*(8), 1135–1143. https://doi.org/10.1007/s00296-016-3459-6

Scioli-Salter, E. R., Smith, B. N., McSheffrey, S., Bair, M. J., Sillice, M. A., Driscoll, M., Higgins, D. M., Allsup, K., Amalathas, A., & Gerber, M. R. (2017). Self-Efficacy for Adoption and Maintenance of Exercise Among Fibromyalgia Patients: A Pilot Study. American Journal of Lifestyle Medicine, 14(4), 437–442. https://doi.org/10.1177/1559827617745264

Schwarzer, R., Luszczynska, A., Ziegelmann, J. P., Scholz, U., & Lippke, S. (2008). Social-cognitive predictors of physical exercise adherence: Three longitudinal studies in rehabilitation. *Health Psychology, 27*(1, Suppl), S54–S63. https://doi.org/10.1037/0278-6133.27.1(Suppl.).S54

Senba, E., & Kami, K. (2017). A new aspect of chronic pain as a lifestyle-related disease. *Neurobiology of Pain, 1,* 6–15. https://doi.org/10.1016/j.ynpai.2017.04.003

Slade, S. C., Patel, S., Underwood, M., & Keating, J. L. (2014). What Are Patient Beliefs and Perceptions About Exercise for Nonspecific Chronic Low Back Pain? *The Clinical Journal of Pain, 30*(11), 995–1005. https://doi.org/10.1097/AJP.0000000000000044

Soriano-Maldonado, A., Ruiz, J. R., Aparicio, V. A., Estévez-López, F., Segura-Jiménez, V., Álvarez-Gallardo, I. C., Carbonell-Baeza, A., Delgado-Fernández, M., & Ortega, F. B. (2015). Association of Physical Fitness With Pain in Women With Fibromyalgia: The al-Ándalus Project. *Arthritis Care & Research, 67*(11), 1561–1570. https://doi.org/10.1002/acr.22610

Sosa-Reina, M. D., Nunez-Nagy, S., Gallego-Izquierdo, T., Pecos-Martín, D., Monserrat, J., & Álvarez-Mon, M. (2017). Effectiveness of Therapeutic

Exercise in Fibromyalgia Syndrome: A Systematic Review and Meta-Analysis of Randomized Clinical Trials. *BioMed Research International, 2017,* 1–14. https://doi.org/10.1155/2017/2356346

Stonerock, G. L., & Blumenthal, J. A. (2017). Role of Counseling to Promote Adherence in Healthy Lifestyle Medicine: Strategies to Improve Exercise Adherence and Enhance Physical Activity. *Progress in Cardiovascular Diseases, 59*(5), 455–462. https://doi.org/10.1016/j.pcad.2016.09.003

Thivel, D., Tremblay, A., Genin, P. M., Panahi, S., Rivière, D., & Duclos, M. (2018). Physical Activity, Inactivity, and Sedentary Behaviors: Definitions and Implications in Occupational Health. *Frontiers in Public Health, 6.* https://doi.org/10.3389/fpubh.2018.00288

Van Liew, C., Leon, G., Neese, M., & Cronan, T. A. (2019). You get used to it, or do you: symptom length predicts less fibromyalgia physical impairment, but only for those with above-average self-efficacy. Psychology, Health & Medicine, 24(2), 207–220.

Wolfe, F., Clauw, D. J., Fitzcharles, M.-A., Goldenberg, D. L., Häuser, W., Katz, R. L., Mease, P. J., Russell, A. S., Russell, I. J., & Walitt, B. (2016). 2016 Revisions to the 2010/2011 fibromyalgia diagnostic criteria. *Seminars in Arthritis and Rheumatism, 46*(3), 319–329. https://doi.org/10.1016/j.semarthrit.2016.08.012

Wolfe, F., Clauw, D. J., Fitzcharles, M.-A., Goldenberg, D. L., Katz, R. S., Mease, P., Russell, A. S., Russell, I. J., Winfield, J. B., & Yunus, M. B. (2010). The American College of Rheumatology Preliminary Diagnostic Criteria for Fibromyalgia and Measurement of Symptom Severity. *Arthritis Care & Research, 62*(5), 600–610. https://doi.org/10.1002/acr.20140

Wolfe, F., Smythe, H. A., Yunus, M. B., Bennett, R. M., Bombardier, C., Goldenberg, D. L., Tugwell, P., Campbell, S. M., Abeles, M., Clark, P., Fam, A. G., Farber, S. J., Fiechtner, J. J., Michael Franklin, C., Gatter, R. A., Hamaty, D., Lessard, J., Lichtbroun, A. S., Masi, A. T., … Sheon, R. P. (1990). The American College of Rheumatology 1990 Criteria for the Classification of Fibromyalgia. Report of the Multicenter Criteria Committee. *Arthritis and Rheumatism, 33*(2), 160–172. https://doi.org/10.1016/j.pain.2008.02.009

Wolfe, F., Walitt, B., Perrot, S., Rasker, J. J., & Häuser, W. (2018). Fibromyalgia diagnosis and biased assessment: Sex, prevalence and bias. *PLOS ONE, 13*(9), e0203755. https://doi.org/10.1371/journal.pone.0203755

Zhang, C.-Q., Leeming, E., Smith, P., Chung, P.-K., Hagger, M. S., & Hayes, S. C. (2018). Acceptance and Commitment Therapy for Health Behavior Change: A Contextually-Driven Approach. *Frontiers in Psychology, 8.* https://doi.org/10.3389/fpsyg.2017.02350