



# Sleep Quality and Fatigue as Predictors of the Benefits of an Interdisciplinary Treatment for Adults with Chronic Pain

Rocio de la Vega, Mélanie Racine, Elena Castarlenas, Ester Solé, Ruben Roy, Mark P. Jensen, Jordi Miró, Douglas Cane

## Background and aims

- Individuals with **chronic pain** are not adequately treated by routine biomedical procedures, including medications.
- Given the current “opioid crisis”, the availability of additional **safe** and efficient **treatments** is critical.
- **Interdisciplinary treatments** have been found effective in decreasing pain intensity, pain-related disability, and improving psychological function.
- However, the **mechanisms of change** of these treatments are not yet well-known.
- **Sleep** problems and **fatigue** are modifiable factors that are often comorbid with chronic pain.

### Aim

To test the **role** that changes in **sleep** quality and **fatigue** might have in predicting the benefits of an interdisciplinary chronic pain treatment program.

### Hypotheses

Greater improvements in sleep quality and greater decreases in fatigue severity would be associated with pre-to post-treatment decreases in:

- 1) Pain intensity
- 2) Disability
- 3) Depressive symptoms

## Method

- This is an **intervention study** with pre- and post-treatment assessment.
- Participants attended a four-week **interdisciplinary** cognitive-behaviorally (**CBT**)-based pain management program.
- **PROMIS-29** scales (measuring depression, sleep, fatigue and pain intensity) and the Physical Disability Index were administered at pre- and post-treatment.

## Data analyses

- **Pre- to post-treatment change** scores were calculated for all the variables.
- Three **multiple regression analyses** were conducted to evaluate the contribution of pre- to post-treatment changes in fatigue and sleep quality to the prediction of outcomes (changes in pain intensity, disability, and depression) while controlling for demographic characteristics (age and sex) and pain intensity.

## Results

- A total of **125 adults** with chronic pain (76% women), with a mean age of **54.4 years** participated, 53% reported significant pain in more than three locations.
- The average pain duration was 10.5 years (SD=11.7).
- Changes in **fatigue, but not sleep quality, made independent and significant contributions** to the prediction of all outcomes. See Tables 1, 2 and 3.

Table 1. Regression analysis predicting changes in pain intensity

Variables	R <sup>2</sup>	Δ R <sup>2</sup>	F	ΔF	β
<b>Step 1.</b>	0.00	0.00	0.005	0.005	
Sex					-0.01
Age					-0.01
<b>Step 2.</b>	0.118	0.115	3.423	6.840*	
Sleep Quality					-0.16
Fatigue Severity					0.30*

Table 2. Regression analysis predicting changes in disability

Variables	R <sup>2</sup>	Δ R <sup>2</sup>	F	ΔF	β
<b>Step 1.</b>	0.066	0.066	2.104	2.10	
Sex					0.04
Age					0.02
Pain Intensity					0.25*
<b>Step 2.</b>	0.131	0.065	2.619	3.24*	
Sleep Quality					-0.15
Fatigue Severity					0.21*

Table 3. Regression analysis predicting changes in depressive symptoms

Variables	R <sup>2</sup>	Δ R <sup>2</sup>	F	ΔF	β
<b>Step 1.</b>	0.091	0.091	3.499	3.49*	
Sex					-0.06
Age					-0.16
Pain Intensity					-0.25*
<b>Step 2.</b>	0.204	0.113	5.282	7.325*	
Sleep Quality					-0.16
Fatigue Severity					0.31*

\*p < 0.05

## Conclusions

- **Fatigue** emerged as a **key potential mechanism** of treatment-related improvements.
- That suggests that **interventions** which effectively **target fatigue** may enhance the efficacy of CBT-based chronic pain treatment.
- This possibility should be evaluated in future research using **larger sample sizes**.
- A highly effective approach for treating fatigue has yet to be identified.

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For information:

[rocio\\_dela\\_vega](#)

[rociovegapsicologa@gmail.com](mailto:rociovegapsicologa@gmail.com)