



Perceived Improvement or Worsening Among Persons with Chronic Pain: Analyses of Pain App Data



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BACKGROUND

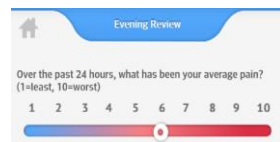
There is an assumption that persons with chronic pain perceive their condition as having improved or worsened solely based on intensity of their pain. However, there is reason to believe that patients' dispositional characteristics as well as day-to-day fluctuations in other symptoms (e.g., sleep problems, negative affect), might also influence patients' perceptions about their overall condition. Longitudinal study designs using daily electronic diaries are known to be superior for the assessment of rapidly fluctuating symptoms in people with chronic pain ¹.

AIMS

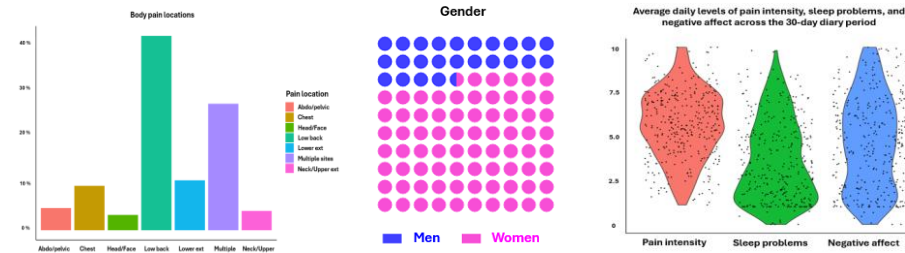
The aim of this study was to examine the degree to which day-to-day fluctuations in pain intensity, sleep quality, and negative affect contributed to patients' perceptions of improvement. We also examined if the impact of daily fluctuations in sleep, negative affect, and pain intensity on patients' perceived improvement varied as a function of sociodemographic factors or dispositional factors such as catastrophic thinking.

METHODS

Patients with chronic pain (N = 334; average age 53.4) were recruited to enter daily assessments on a smartphone pain app (MobileNetrix for iPhone and Android) as part of previous clinical trials.^{2,3} Patients completed sociodemographic information and baseline questionnaires including the Pain Catastrophizing Questionnaire.⁴ All participants were then asked to complete a 5-item daily assessment on the pain app. The assessment consisted of ratings of sleep disturbances, negative affect (i.e., anxiety & depressive symptoms), and pain intensity on visual analogue scales (VAS, 0-10). Every day patients were also asked to report whether their overall condition had worsened (0), remained the same (5), or gotten better (10) over the past 24 hours. Results were analyzed using multilevel modeling.

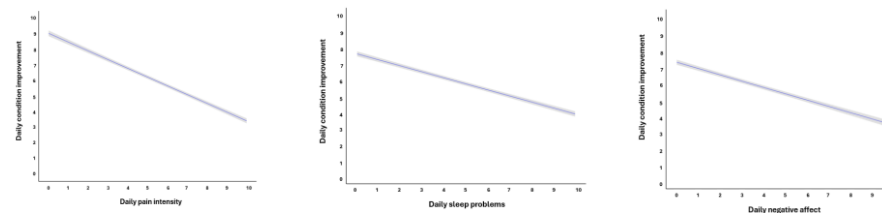


RESULTS

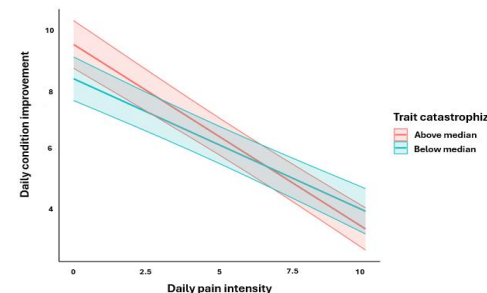


Day-to-day predictors of perceived improvement

Results from a series of multilevel analyses indicated that day-to-day increases in sleep problems, negative affect, and pain intensity were associated with lower ratings of perceived improvement (all p 's < 0.01).



None of the demographic characteristics influenced patients' reports of perceived improvement, but dispositional catastrophizing was associated with lower average ratings of condition improvement across the 30-days ($p < 0.001$).



A multilevel moderation analysis indicated that day-to-day increases in pain intensity were associated with perceived condition worsening, but this association was strongest among those with higher levels of catastrophizing ($p < 0.05$).

CONCLUSIONS

This study demonstrated that overall perceived condition improvement or worsening is related not only to fluctuations in pain intensity, but also sleep disturbances, negative affect, and personality predispositions. Most notably, catastrophizing plays an important role in perceived condition worsening.

There has been an increased use of smartphone pain applications (apps) with daily monitoring among persons with chronic pain. Patients with chronic pain typically report having good and bad days. Clinicians like to know which of their patients are prone to report extreme worsening of their condition despite some contradictory evidence of benefit from treatment.

Frequent daily assessments of pain and perceived improvement can help to identify those who are prone to report extreme changes in perceived improvement or worsening of their pain over time. Clinicians with access to data from smartphone pain applications (apps) have increased opportunity to accurately identify those individuals who are most prone to report perceived worsening.

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