

# Digital Interventions for Chronic Pain and Mental Health in Primary Care: A Longitudinal Observational Study

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## Background

Chronic pain and mental health disorders, particularly depression and anxiety, are among the most prevalent conditions managed in primary care settings, contributing to significant global disability. Non-pharmacological interventions, including digital health tools, offer an innovative and accessible approach to treating these conditions. QHSLab, a digital health platform grounded in cognitive behavioral therapy (CBT) and population health, provides comprehensive resources such as Health Journeys and the Painless series to assist patients in managing chronic pain and mental health symptoms. The Painless series consists of five parts, which progressively help patients regain control of their lives by understanding pain mechanisms, managing pain-related fear, and adopting pacing strategies to prevent the “boom and bust” cycle.

## Objective

This study aimed to evaluate the effectiveness of QHSLab’s digital therapeutic intervention, specifically the Health Journeys and Painless series, in reducing chronic pain intensity and improving mental health outcomes in primary care patients with comorbid depression and anxiety.

## Methods

This longitudinal, observational study followed 1,500 primary care patients with chronic pain and coexisting mental health conditions over 12 months. Patients were enrolled in QHSLab’s digital therapeutic program, which provided structured guidance and resources tailored to address physical and mental health challenges. Pain intensity was self-reported on a scale from 0 (no pain) to 10 (most painful), and mental health outcomes were measured using the Patient Health Questionnaire (PHQ-9) for depression and the Generalized Anxiety Disorder scale (GAD-7). Statistical analyses, including paired t-tests, were conducted to assess changes in pain and mental health scores. Effect sizes (Cohen’s d) were calculated to quantify the impact of the intervention.

## Results

Pain interference scores decreased from (M±SD)  $2.1 \pm 1.4$  at baseline to  $2.0 \pm 1.3$  at follow-up ( $p < 0.01$ ). Pain scores dropped by an average of 3.5 points ( $p < 0.01$ ). The PHQ-9 score decreased from  $2.8 \pm 4.2$  at baseline to  $2.4 \pm 4.0$  at follow-up, reducing 0.32 points ( $p < 0.001$ ). Similarly, GAD-7 scores decreased from  $2.4 \pm 4.3$  at baseline to  $2.1 \pm 4.0$  at follow-up, reducing 0.27 points ( $p < 0.001$ ). These results suggest significant improvements in pain, depression, and anxiety following the digital intervention.

## Conclusions

QHSLab’s digital therapeutic intervention, combining the Painless series and Health Journeys, significantly reduced chronic pain interference and improved mental health outcomes in primary care patients with comorbid depression and anxiety. These findings suggest that digital health tools can serve as effective non-pharmacological solutions for managing chronic conditions, offering accessible and scalable options for improving patient care. As healthcare continues to embrace digital innovation, interventions in patient-centered healthcare technologies may play a crucial role in enhancing patient self-management and reducing the burden of chronic pain and mental health disorders. QHSLab Inc. supported this study.