Early Pain Self-Efficacy Predicts Chronic Pain and Pain-Related Disability 24 Months After Lower Extremity Fracture

Josh Van Wyngaarden, DPT, PT; Brian Noehren, PT, PhD; Kristin Archer, PhD;
***Lucy C. Bowers, BS**; Paul E. Matuszewski, MD*
University of Kentucky, Lexington, KY, United States

Purpose: Psychosocial factors carry important associations with pain-related disability after lower extremity fracture (LEF). However, no study to date has evaluated multiple psychosocial variables simultaneously to assess which construct carries the most consistent association with pain outcomes. The purpose of this study was to assess pain catastrophizing, pain self-efficacy, and depression 3 months after surgery for LEF and determine which construct was consistently predictive of the development of chronic pain and pain-related disability at 24 months. We hypothesized that pain self-efficacy would be consistently associated with all pain outcomes.

Methods: 122 patients (41.7 ± 14.7 years) with an LEF requiring surgical fixation and no history of chronic pain were recruited from a Level I trauma center for participation in a prospective cohort study. Three months after definitive surgical fixation, patients completed the Pain Catastrophizing Scale, Pain Self-Efficacy Questionnaire, and PROMIS (Patient-Reported Outcomes Measurement Information System) Depression computer adaptive test. Demographic and injury characteristics were extracted from the patient's medical record. Chronic pain development was assessed 24 months after surgery, and was defined using the National Institutes of Health recommendation of pain present greater than 3 months and bothersome at least half the days over the last 6 months. Patients also completed the Brief Pain Inventory Pain Severity Subscale and the PROMIS Pain Interference, with higher scores indicating worse pain outcomes. Separate multivariable linear regression analyses were conducted for each outcome, controlling for the outcome at baseline, ISS, age, smoking status, body mass index, education level, and depression, pain catastrophizing, and self-efficacy at 3 months.

Results: 99 patients (81%) completed this study. Of these patients, 28 (28.3%) reported chronic pain at 2 years. Pain self-efficacy at 3 months was associated with chronic pain development (odds ratio: 0.93; 95% confidence interval [CI]: 0.88 to 0.98; $P = 0.007$), pain severity (β: –0.06; 95% CI: –0.1 to –0.02; $P = 0.008$), and pain interference (β: –0.28; 95% CI: –0.47 to –0.08; $P = 0.006$) at 24 months. Pain catastrophizing and depression were not related to any outcomes (P>0.05).

Conclusion: Low pain self-efficacy at 3 months was consistently predictive of chronic pain, pain severity, and pain interference at 24 months after surgery for LEF. These results indicate that the patient's early confidence and beliefs regarding their recovery potential strongly influence their actual outcome. This is especially relevant given that most patients begin a functional rehabilitation progression 3 months after surgery. Physicians can utilize this 10-item questionnaire early in recovery to identify patients at risk for poor outcomes and identify meaningful interventions to improve the recovery trajectory.