

Does Self-Efficacy Early in Recovery Predict Objective Measures of Physical Function One Year After Lower Extremity Fracture?

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Purpose: Psychosocial factors have been shown to carry important associations with self-reported disability and pain after lower extremity fracture. However, it is unknown if these factors are associated with objective measures of physical function. The purpose of this study was to assess whether fear of movement, depression, and pain self-efficacy 6 weeks after surgery for tibia or femur fractures is predictive of physical function measures, including peak quadriceps strength, single-leg step down (SLSD) repetitions, and single-leg calf raise (SLCR) repetitions at 12-month follow-up. We hypothesized that pain self-efficacy would be consistently associated with all outcomes.

Methods: 72 patients (42.4 ± 14.9 years) with a tibia or femur fracture requiring surgical fixation were recruited from a Level I trauma center for participation in a prospective, observational study. Six weeks after definitive surgical fixation, patients completed the Tampa Scale of Kinesiophobia to measure fear of movement, PROMIS (Patient-Reported Outcomes Measurement Information System) Depression computer adaptive test, and Pain Self-Efficacy Questionnaire. At 12 months, patients returned for a functional assessment. Peak quadriceps strength was assessed with 4 maximal isometric contractions each lasting 5 seconds using a Biodex System 4. The peak force from each of the 4 trials was determined, averaged, and normalized to the patient's body weight. SLSD repetitions were determined by the number of controlled step-downs off an 8-in step completed in 60 seconds. SLCR repetitions were determined by the maximum number of calf raises performed to failure without taking any rest while maintaining the knee in full extension. Separate multivariable linear regression analyses were conducted for each outcome, controlling for age, body weight, depression, fear of movement, and self-efficacy at 6 weeks.

Results: 48 patients (67%) completed this study. Pain self-efficacy at 6 weeks was associated with peak quadriceps strength (β : 0.014; 95% confidence interval [CI]: 0.001 to 0.03; $P = 0.04$), SLSD (β : 0.31; 95% CI: 0.06 to 0.55; $P = 0.01$), and SLCR (β : 0.34; 95% CI: 0.09 to 0.59; $P = 0.009$) at 12 months. Fear of movement and depression were not related to any outcomes ($P > 0.05$).

Conclusion: Low pain self-efficacy at 6 weeks predicted peak quadriceps strength, SLSD repetitions, and SLCR repetitions 12 months after surgery for tibia and femur fractures. These results indicate that the patient's early confidence and beliefs regarding their recovery potential strongly influence their actual outcome. 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.