

Adverse Mental Health Outcomes After Severe Open Tibia Fracture: A Secondary Analysis of the FIXIT Study

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Purpose: Risk factors for adverse mental health sequelae and long-term pain after severe open tibial shaft fractures are unknown. We hypothesized that risk factors could be identified and that adverse mental health outcomes would differ between patients managed with external ring fixation versus internal fixation at 12 months after injury.

Methods: This is a secondary analysis of the FIXIT trial that included patients 18 to 64 years of age with severe open tibial shaft fractures participating in the randomized trial and concurrent observational study. Outcomes included Patient Health Questionnaire (PHQ) scores for depression symptoms, PTSD Checklist for DSM-5 (PCL-5), and the Brief Pain Inventory (BPI). PHQ score ≥ 10 signified presence of moderate depression, PCL-5 score ≥ 33 signified presence of PTSD, and BPI scores ≥ 5 signified at least moderate pain.

Results: 340 participants (79%) completed 12-month outcomes questionnaires. 28% experienced moderate depression. Risk factors for depression were age 35-45 years (RR: 2.0 [1.0, 3.8]), female sex (RR: 1.6 [1.1, 2.4]), high school education attainment or less (RR: 1.8 [1.2, 2.7]), and baseline mental health conditions (RR: 1.7 [1.1, 2.5]), all $P < 0.05$. 41% of patients met criteria for PTSD. Risk factors for PTSD included baseline mental health conditions (RR: 1.8 [1.3, 2.3]), whereas higher self-efficacy at 6 weeks post-injury was protective (RR: 0.6 [0.5, 0.8]), both $P < 0.05$. 42% of patients experienced moderate to severe pain interference. High school educational attainment or less was a risk factor (RR: 1.5 [1.1, 2.0]), and greater self-efficacy was found to be protective (RR: 0.6 [0.5, 0.8]), both $P < 0.05$. Fixation modality was not associated with depression, PTSD, or pain.

Conclusion: A high proportion of patients were still experiencing adverse mental health sequelae and moderate to severe pain 1 year after severe open tibial shaft fractures. These outcomes occurred more often in women, patients with lower educational attainment, and those with baseline mental health conditions, whereas greater self-efficacy appeared to be protective. In contrast to our hypothesis, these outcomes were not influenced by fixation modality.