

The Impact of Area Deprivation Index on Follow-up Rates and PROMIS Scores Following Tibial Fracture: A Retrospective Analysis

Mattie Raiford, MD; Mina Botros, MD; Paul G. Guirguis, BA; Catherine A. Humphrey, MD; Sandeep P. Soin, MD; John T. Gorczyca, MD; John P. Ketz, MD

Purpose: The optimization of tibial fracture repair has been well studied; however, many factors in the recovery period can affect the healing process. An understanding of whether socioeconomic factors play a role in patient-reported outcomes following tibial fracture repair is imperative to accurately advise recovery protocols. The hypothesis of this study is that the Area Deprivation Index (ADI) is highly correlated with Patient-Reported Outcomes Measurement Information System (PROMIS) scores and follow-up rate among patients who sustained tibia fractures in order to determine whether access to financial resources can ultimately impact patient-reported outcomes.

Methods: From January 31, 2018 to January 31, 2022, a total of 227 patients underwent operative treatment for tibial fracture at a single Level I trauma center. 91 patients met ADI inclusion criteria. Patients were included if they met criteria for one of the two groups: (1) National ADI >75th percentile (High-ADI) and (2) National ADI <25th percentile (Low-ADI). All available PROMIS scores for the patients of each group were collected and analyzed. Kruskal-Wallis test and multilogistic regression analysis were utilized. Significance was set at $P < 0.05$.

Results: Of the 91 patients, 48% were females with an average age of 46.07 years (± 7.6). The mean ADI value of our cohort was 51.36 (± 15.3 standard deviation [SD]). The High-ADI group had a value of 99.67 (± 0.50 SD) and the Low-ADI group a value of 18.0 (± 3.873 SD). Compared to Low-ADI, patients with High-ADI had a longer operative time (1176 min [± 392.9] vs 989.4 min [± 241.03], $P = 0.04$). There was no correlation between length of stay and ADI score. No statistical difference was seen in the follow-up rate between both groups ($P = 0.622$). High-ADI was also associated with worse PROMIS Pain Interference score (64.9 [± 2.6] vs 58.6 [± 8.3] $P = 0.04$), compared to the Low-ADI group. High ADI score is associated with lower PROMIS physical function ($P < 0.01$) and greater postoperative depression ($P < 0.01$).

Conclusion: ADI score is a significant outcome predictor for postoperative course among patients who underwent surgical fixation of a tibial fracture. Patients who have socioeconomic disadvantages tend to have longer surgical time, greater pain interference, worse physical function, and higher depression PROMIS scores.