Is there a Relationship between Pain Catastrophizing Scale (PCS), Opioid Use, and Overall Healthcare Resource Utilization (HRU) post-Total Knee Arthroplasty?

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Background

Total Knee Arthroplasty (TKA) effectively relieves osteoarthritis pain, but ~20% of patients experience persistent pain. The Pain Catastrophizing Scale (PCS) assesses pain-related cognitive-emotional responses, with higher scores linked to increased pain perception, opioid use, and healthcare resource utilization (HRU). Given its role in predictive role, PCS is a key tool for identifying patients needing enhanced perioperative pain management**.** This study examines the relationship between preoperative PCS scores, opioid use, and HRU within 6 months post-TKA.

Methods

This retrospective chart review included 66 patients who underwent primary TKA between January 2018 and April 2024. All patients received Iovera cryo-neurolysis preoperatively for pain relief. Data included demographics, preoperative PCS scores, opioid prescriptions (Louisiana Opioid Registry), and HRU (physical therapy, emergency department visits, follow-up appointments). Patients were stratified by PCS scores to assess trends in opioid consumption (total morphine milligram equivalents, MME) and HRU. Statistical analyses included Pearson and Spearman correlation, Wilcoxon Mann-Whitney tests, and one-way ANOVA to evaluate associations between PCS and opioid use or HRU. Regression models adjusted for age, sex, BMI, comorbidities, and opioid naïveté.

Results

Higher PCS scores significantly correlated with PROMIS Anxiety ($r = 0.61$, $p < 0.0001$), PROMIS Depression ($r = 0.65$, $p < 0.0001$), and KOOS Pain ($r = -0.51$, $p < 0.0001$), indicating greater preoperative psychological distress and perceived pain. However, PCS did not predict post-TKA opioid use (pre-MME: $p = 0.141$, post-MME: $p = 0.716$) or HRU (PT: $p = 0.963$, follow-ups: $p = 0.184$, other visits: $p = 0.351$). After adjusting for opioid naïveté, the association between PCS and opioid prescriptions approached significance ($p = 0.055$). Depression (PROMIS-DEP4a) significantly predicted opioid prescriptions post-TKA ($p = 0.029$).

Conclusion

While PCS correlated with anxiety, depression, and worse knee function, it did not significantly predict opioid use or HRU post-TKA. Depression remained a significant predictor of opioid prescriptions, highlighting the need for preoperative psychological screening. The near-significant PCS-opioid link suggests further study with a larger cohort. Expanding the dataset and time points may refine pain management strategies. Identifying psychological risk factors preoperatively could lead to more personalized pain management and improved outcomes.