Disparate Impact: How Does Social Deprivation Affect Patient-Reported Outcomes following Anterior Cruciate Ligament Reconstruction in Children and Adolescents?

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INTRODUCTION: Although previous research has shown that lower socioeconomic status is associated with delayed care, there is a paucity of literature evaluating the association with patient-reported outcomes. Using the Area Deprivation Index (ADI) as a validated proxy for socioeconomic status, the purpose of this study was to determine how relative socioeconomic disadvantage affects outcomes following primary anterior cruciate ligament reconstruction (ACLR) in children and adolescents.

METHODS: This retrospective cohort study included all patients ≤18 years old who underwent primary ACLR at a single academic institution between 2018-2021. Patients were excluded for multiligamentous knee injury, congenital ACL absence surgery, concurrent osteochondral allograft surgery, and absent outcomes data. Minimum follow up was six months. Patient-Reported Outcomes Measurement Information System (PROMIS) Version 1 was completed by patients at each postoperative visit and domain scores were generated (mobility, pain interference, anxiety, fatigue, depression, and peer relationships; minimal clinically important difference: 3 points). National ADI percentile – which utilizes 17 United States census factors to calculate relative socioeconomic disadvantage – was calculated using the patients' home address. Patients were divided into quartiles – patients in the low deprivation group (<25th percentile) came from census tracts with the least socioeconomic deprivation, those in the severe deprivation group (>75th percentile) came from census tracts with the highest socioeconomic deprivation. Comparative analyses were performed to determine the relationship between ADI and PROMIS domain scores following ACLR.

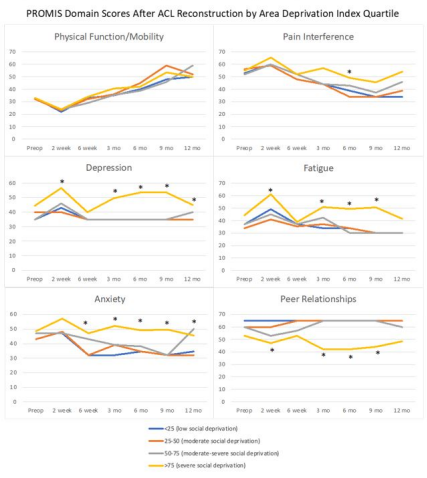
RESULTS:

A total of 413 eligible patients were identified. Median age was 15-years-old. Overall, 49% (n=207) of patients were from an area with low deprivation, 33% from an area with moderate deprivation (n=139), 11% from an area with moderate-severe deprivation (n=48), and 7% from an area with severe deprivation (n=30). As compared to those in the national quartile with low socioeconomic disadvantage, patients with the severe socioeconomic disadvantage group had a delay in both time to first clinic visit (11 vs. 16.5 days, p=0.044) and to surgery (51 vs. 80 days, p=0.004). There were no differences in the rate of concomitant injuries or additional procedures at the time of surgery (p>0.05). All patients had progressive improvements in mobility and pain throughout the recovery process (**Figure 1**). Those with severe socioeconomic disadvantage had statistically and clinically worse psychosocial outcomes throughout the postoperative recovery period, including significantly increased depression, fatigue, and anxiety and worse peer relationships at multiple postoperative timepoints.

DISCUSSION AND CONCLUSION:

ADI is an efficient and validated proxy for socioeconomic status. Although there were no differences in any preoperative PROMIS domain scores, children and adolescents with the highest relative socioeconomic disadvantage had disparate psychosocial outcomes following ACLR. These findings highlight the need for equitable optimization of postoperative mental health services following ACLR in children and adolescents.

Figure 1: Trends of PROMIS Physical Function/Mobility, Pain Interference, Depression, Fatigue, Anxiety, Peer Relationships by Area Deprivation Index Postoperatively



*p-value<0.05