

# Socioeconomic Deprivation Is Not Associated with Postoperative Complications Following Revision Total Hip and Knee Joint Arthroplasty: A Retrospective Analysis

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**INTRODUCTION:** Revision hip and knee total joint arthroplasty (TJA) carries a high burden of postoperative complications, including surgical site infections (SSI), venous thromboembolism (VTE), reoperation, and readmission, which negatively affect postoperative outcomes and patient satisfaction. The identification of the risk factors contributing to poorer outcomes following revision TJA is of paramount importance as it can assist surgeons in anticipating and mitigating potential complications preoperatively. Socioeconomic area-level composite indices such as the area deprivation index (ADI) are increasingly important measures of social determinants of health (SDoH). However, there is limited published data on the potential relationship between ADI and revision TJA outcomes. This study aims to determine the potential association between ADI and SSI, VTE, reoperation, and readmission occurrence 90 days following revision TJA.

**METHODS:** A single-institution retrospective analysis of 1,047 consecutive revision TJA patients was conducted. Patient demographics, medical variables, and the occurrence of postoperative complications of interest within 90 days following revision surgery were documented. Complications included SSI, VTE, reoperation, and readmission, all of which were combined into one dependent variable. ADI rankings were extracted using residential zip codes and categorized into quartiles. Univariate and subsequent multivariate logistic regressions were performed to analyze the association of ADI as an independent factor for complication following revision TJA.

**RESULTS:** 166 (15.9%) patients who underwent revision TJA experienced at least one of the aforementioned complications within 90 days after surgery. Of these, 100 (9.6%) patients experienced at least one readmission, 69 (6.6%) patients underwent reoperation, 45 (4.3%) patients experienced VTE, and 48 (4.6%) patients had an SSI. Depression ( $p=0.034$ ) and high ASA score ( $p<0.001$ ) were associated with higher odds of a combined complication postoperatively on univariate logistic regression. ADI was not associated with the occurrence of any of the complications recorded following surgery ( $p=0.092$ ). ASA remained an independent risk factor for developing postoperative complications on multivariate analysis.

**DISCUSSION AND CONCLUSION:** This study found no significant association between ADI and postoperative complications, suggesting that ADI might not be a comprehensive predictor of postoperative outcomes due to its limited consideration of socioeconomic factors. An ASA score of 3 or higher was significantly associated with higher odds of developing postoperative complications. While ADI is increasingly used to measure social determinants of health, it may not fully capture factors relevant to postoperative outcomes. Exploring alternative area-level indices could improve patient care and outcomes.

**Table 1.** Logistic regression analysis for the occurrence of a combined complication within 90 days following revision of total joint arthroplasty.

Variable* (Reference)	Univariate OR (95% CI)	P-value	Multivariate OR (95% CI)	P-value
Sex (Female)	0.97 (0.70–1.35)	0.873	0.99 (0.70–1.41)	0.963
Insurance (Private)		0.923		0.955
Public	1.02 (0.72–1.44)	0.879	1.07 (0.71–1.58)	0.769
Uninsured	0.75 (0.17–3.40)	0.732	0.98 (0.21–4.66)	0.979
Race (White)	1.15 (0.57–2.33)	0.695	1.22 (0.59–2.52)	0.593
Age	1.00 (0.98–1.02)	0.945	1.00 (0.97–1.02)	0.698
BMI	1.01 (0.99–1.04)	0.380	1.01 (0.98–1.04)	0.605
ASA (1-2)	1.84 (1.30–2.59)	< 0.001	1.75 (1.21–2.54)	0.003
Depression	1.64 (1.04–2.59)	0.034	1.56 (0.94–2.58)	0.086
Drug use	1.67 (0.60–4.63)	0.322	1.34 (0.45–3.97)	0.595
CCI	1.02 (0.93–1.10)	0.732	1.01 (0.90–1.13)	0.895
ADI (Q1)		0.092		0.223
Q2	1.09 (0.70–1.70)	0.717	1.07 (0.67–1.72)	0.776
Q3	0.62 (0.38–1.00)	0.051	0.65 (0.39–1.07)	0.092
Q4	0.79 (0.49–1.26)	0.695	0.91 (0.55–1.49)	0.695

\*Brackets ( ) are reference categories.

ADI=area deprivation index; SD=standard deviation; BMI=body mass index; CCI=Charlson Comorbidity Index