

## Can Socioeconomic Deprivation Measures Identify the Risk of 90-Day ED Utilization Following Revision Total Hip and Knee Arthroplasty?

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**INTRODUCTION:** Although socioeconomic deprivation has been found to contribute to disparate postoperative outcomes, the utility of recently developed social determinants of health (SDOH) indices is uncertain in patients with total hip and knee arthroplasty. With emergency department (ED) utilization emerging as an alternative measure of the quality of surgical care, our study aimed to evaluate the association between commonly used deprivation measures with postoperative 90-day ED utilization following revision total hip and knee arthroplasty (rTJA).

**METHODS:** 1397 consecutive patients undergoing rTJA were retrospectively reviewed and stratified based on 90-day postoperative ED utilization. SDOH indices such as area (ADI) and social deprivation index (SDI), social vulnerability index (SVI), and median income of each patient were characterized. Univariate and multivariate logistic regression models were developed to assess the association of postoperative ED utilization with deprivation measures after controlling for confounding variables.

**RESULTS:** 1047 patients with a 7.2% (n=76) postoperative ED utilization rate were included. Higher ADI ranks were associated with decreased odds of ED utilization (aOR=0.98, 95%CI [0.96,1.00], p=0.03), with patients in the third and fourth ADI quartiles having 57% (aOR=0.43, 95%CI [0.22, 0.86], p=0.02) and 55% (aOR=0.45, 95%CI [0.21, 0.95], p=0.04) lower likelihood of postoperative ED utilization. Conversely, race, ASA class, and depression were associated with increased odds of ED utilization after rTJA. SDI, SVI, and median income were not significantly associated with 90-day ED visits after rTJA (Table 1).

**DISCUSSION:** Our findings highlight disparities in 90-day ED utilization following rTJA with higher ADI ranks associated with decreased ED utilization, underscoring the need for improved postoperative healthcare in these populations with socioeconomic deprivation. This study illustrates the potential of social deprivation measures in determining risk for 90-day healthcare utilization following rTJA. Prioritizing the increase in community resources for at-risk populations may ensure accessible postoperative care and improved clinical outcomes following rTJA.

**SIGNIFICANCE/CLINICAL RELEVANCE:** Our findings may inform targeted interventions and policies for at-risk patient populations with socioeconomic deprivation to mitigate disparities and improve outcomes of revision total hip and knee arthroplasty.

**Table 1.** Univariate and multivariate logistic regression analyses evaluating the association of social deprivation measures (ADI, SDI, SVI, Median income) with 90-day emergency department utilization following revision total hip and knee arthroplasty.

Parameter	Unadjusted Analysis		Adjusted Analysis	
	P-Value	OR (95% CI)	P-Value	OR (95% CI)
Age	0.21	1.02 (0.99-1.04)	0.77	1.00 (0.96-1.03)
BMI	0.40	0.98 (0.94-1.02)	0.59	0.99 (0.95-1.03)
Gender	0.68	0.91 (0.57-1.45)	0.89	1.05 (0.62-1.77)
Race (Binarized)	<b>0.01</b>	2.85 (1.21-5.50)	<b>&lt;0.001</b>	4.06 (1.73-9.52)
Ethnicity (Binarized)	0.50	2.00 (0.27-12.99)	0.72	1.49 (0.17-13.05)
Insurance	0.67		0.48	
Public	0.70	1.11(0.67-1.82)	0.68	1.13 (0.63-2.04)
No Insurance	0.39	1.97 (0.42-9.16)	0.23	2.80 (0.52-15.12)
History of Depression	<b>&lt;0.001</b>	4.91 (2.94-8.21)	<b>&lt;0.001</b>	5.06 (2.83-9.06)
History of Drug Abuse	0.46	3.11 (1.02-9.48)	0.85	0.86 (0.19-3.89)
History of Alcohol	0.80	1.07 (0.66-1.74)	0.88	0.96 (0.56-1.63)
ASA (Binarized)	<b>0.002</b>	2.23 (1.35-3.69)	<b>0.03</b>	1.89 (1.09-3.28)
CCI Score	0.08	1.10 (0.99-1.23)	0.59	1.04 (0.90-1.21)
Area Deprivation Index rank	<b>0.004</b>	0.98 (0.96-0.99)	<b>0.03</b>	0.98 (0.96-1.00)
Area Deprivation Index Quartiles*	<b>0.004</b>		<b>0.04</b>	
Second Quartile	<b>0.02</b>	0.47 (0.25-0.88)	0.06	0.52 (0.26-1.03)
Third Quartile	<b>0.01</b>	0.40 (0.21-0.76)	<b>0.02</b>	0.43 (2.15-0.86)
Fourth Quartile	<b>0.004</b>	0.37 (0.19-0.72)	<b>0.04</b>	0.45 (0.21-0.95)
Social Deprivation Index score	0.59	1.00 (0.99-1.01)	0.94	1.00 (0.99-1.01)
Social Vulnerability Index rank	0.99	1.00(0.99-1.01)	0.71	1.00 (0.09-1.01)
Estimated Median Income	0.23	1.00 (1.00-1.00)	0.27	1.00 (1.00-1.00)

\* First quartile is selected as reference category