Racial Inequities in Robotic Bariatric Surgery: An MBSAQIP Analysis (2021-2022)

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INTRODUCTION

- The proportion of bariatric surgeries completed robotically is continuing to increase.
- Robotic surgery costs more than laparoscopic procedures and its implementation may not be uniform across patient populations.
- In this context, we seek to determine if patient race influences the likelihood of undergoing bariatric surgery with a robotic surgical platform.

METHODS

- Data: The Metabolic and Bariatric Surgery Accreditation and Quality Improvement Project (MBSAQIP) between 2021 to 2022.
- Likelihood of undergoing robotic surgery (compared to the conventional laparoscopic approach) and 30-day outcomes compared to white patients were determined using a multivariable logistic regression analysis
- Any baseline demographic or clinical characteristics related to each outcome that were significant based on univariate analysis were adjusted for in the multivariable regression model.

Identified **411,747** *White, Hispanic, Black, Asian, Pacific Islander, or Native American* patients undergoing bariatric surgery from 2021 – 2022

→ **25,190** Participants excluded for:
- ASA Class of 5
- Emergency operation
- Any other concurrent procedures
- No 30-day follow up
- Unknown sex, ASA class or functional status prior to surgery
- Age <13 or >80
- Unknown baseline characteristics

386,557 total patients selected:
- White: 227,967 (59.0%)
- Black: 83,097 (21.5%)
- Hispanic: 70,335 (18.2%)
- Asian: 2,393 (.6%)
- Native American: 1,900 (0.5%)
- Pacific Islander: 865 (0.2%)

105,484 robotic only patients:
- White: 62,157 (59.0%)
- Black: 24,511 (23.2%)
- Hispanic: 17,687 (16.8%)
- Asian: 582 (0.6%)
- Native American: 384 (0.4%)
- Pacific Islander: 163 (0.2%)

RESULTS

- When compared to White patients, Black patients were more likely to have their procedures performed robotically (OR 1.09 [1.07-1.12], p<0.001) **(Table I).**
- Hispanic (OR 0.95 [0.93-0.97], p<0.001), Native Hawaiian/Pacific Islander (OR 0.62 [.52-0.73], p<0.001), and American Indian/Native Alaskan (OR 0.68 [0.60-0.76], p<0.001) all had a significantly lower likelihood of undergoing robotic bariatric surgery. **(Table I).**
- Asian patients had no difference in likelihood to receive robotic surgery compared to White patients (OR 0.91 [0.83-1.01], p=0.066) **(Table I).**
- Black patients had a higher likelihood of 30-day readmission compared to White patients (OR 1.44 [1.34-1.55], p <0.001). There was no difference in 30-day readmission among other races compared to White patients **(Table II).**
- Compared to White patients, there were no differences in 30-day reoperation among the other races **(Table III).**

Table I: Multivariable logistic regression model predicting likelihood of undergoing robotic bariatric surgery

Characteristic	Odds Ratio	95% CI	P value
Race			
White	Reference	-	-
Black	1.09	1.07, 1.12	**<0.001**
Hispanic	0.95	0.93, 0.97	**<0.001**
Asian	0.91	0.83, 1.01	0.066
Native American	0.68	0.60, 0.76	**<0.001**
Pacific Islander	0.62	0.52, 0.73	**<0.001**

CI, Confidence Interval.
Adjusted for age, sex, BMI, smoking status, procedure type (initial, conversion, revision), ASA class, operation length, history of diabetes mellitus, chronic steroid use, preoperative COVID, chronic obstructive pulmonary disease (COPD), pulmonary embolism, sleep apnea, gastroesophageal reflux disease, previous foregut surgery, myocardial infarction, PCI, previous cardiac surgery, hypertension, hyperlipidemia, deep venous thrombosis, therapeutic anticoagulation, venous stasis, IVC filter placement, dialysis, renal insufficiency.

Table II: Multivariable logistic regression model predicting likelihood of 30-day readmission

Characteristic	Odds Ratio	95% CI	P value
Race			
White	Reference	-	-
Black	1.44	1.34, 1.55	**<0.001**
Hispanic	1.09	0.99, 1.20	0.077
Asian	0.89	0.52, 1.41	0.6
Native American	0.94	0.51,1.58	0.8
Pacific Islander	1.09	0.43, 2.28	0.8

CI, Confidence Interval.
Adjusted for age, sex, BMI, smoking status, procedure type (initial, conversion, revision), ASA class, operation length, history of diabetes mellitus, chronic steroid use, preoperative COVID, chronic obstructive pulmonary disease (COPD), pulmonary embolism, sleep apnea, gastroesophageal reflux disease, previous foregut surgery, myocardial infarction, PCI, previous cardiac surgery, hypertension, hyperlipidemia, deep venous thrombosis, therapeutic anticoagulation, venous stasis, IVC filter placement, dialysis, renal insufficiency.

Table III: Multivariable logistic regression model predicting likelihood of 30-day reoperation

Characteristic	Odds Ratio	95% CI	P value
Race			
White	Reference	-	-
Black	1.07	0.93, 1.22	0.3
Hispanic	1.05	0.90, 1.22	0.05
Asian	1.35	0.64, 2.48	0.4
Native American	1.64	0.74,3.11	0.2
Pacific Islander	1.01	0.17, 3.20	>0.9

CI, Confidence Interval.
Adjusted for age, sex, BMI, smoking status, procedure type (initial, conversion, revision), ASA class, operation length, history of diabetes mellitus, chronic steroid use, preoperative COVID, chronic obstructive pulmonary disease (COPD), pulmonary embolism, sleep apnea, gastroesophageal reflux disease, previous foregut surgery, myocardial infarction, PCI, previous cardiac surgery, hypertension, hyperlipidemia, deep venous thrombosis, therapeutic anticoagulation, venous stasis, IVC filter placement, dialysis, renal insufficiency.

CONCLUSIONS

- Black patients are more likely to undergo robotic bariatric surgery and to be readmitted postoperatively than White patients.
- Hispanics, Pacific islanders, and Native Americans are less likely to have their procedures completed robotically than White patients.
- When undergoing robotic surgery, Hispanic, Asian, Pacific Islander, and Native American patients had no difference in 30-day readmission, or 30-day reoperation compared to white patients
- There are significant racial inequities in access to robotic technologies in bariatric surgery. Further studies are needed to better understand the factors driving this inequity.

ACKNOWLEDGEMENTS

LOYOLA MEDICINE

MBSAQIP
METABOLIC AND BARIATRIC SURGERY ACCREDITATION AND QUALITY IMPROVEMENT PROGRAM