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Obesity in the Geriatric Population

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Chairperson: Jillian Harvey, PhD
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This retrospective cross-sectional study focused on patients who were 65 years and older who have Medicare and an ICD10 code of obesity. The study uses archival billing data from the 2017 Medicare 5% Limited Data Set to examine use of bariatric surgery. This study examined the different characteristics (geographic region, age, sex, co-morbidities) for all patients with a BMI greater than 40 who had bariatric surgery in 2017 compared to patients with a BMI greater than 40 who did not receive a surgical intervention. Results found that patients who are female are associated with higher odds of receiving bariatric surgery. Patients who are older, dual eligible for Medicare and Medicaid, or have a diagnosis of diabetes with complications are associated with lower odds of receiving bariatric surgery.

The results of this study should be used to target patients over the age 65, have a diagnosis of obesity, and are considering making healthy lifestyle change with bariatric surgery or other healthy options.

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1 CHAPTER I INTRODUCTION

1.1 Background and Need

The percentage of Americans who are obese, continues to rise. In the United States, as of 2016, nearly 40% of the population were obese, an approximate 6% increase in less than 8 years (Commonwealth Fund, 2018). According to World Health Organization, obesity is defined as extreme and abnormal fat accumulation that may result in the deterioration of health (Koh et al., 2018). Obesity is defined as having a body mass index (BMI) at or about the 95th percentile depending on the age, sex of the individual (Wilfley et al., 2018).

Being overweight is broken down into several categories; overweight has a BMI 25-29.5, obesity includes those who have a BMI greater than 30 and morbid obesity has a BMI greater than 40 in adults and this increasing each year (Wifley et al., 2018).

1.2 Problem Statement

An individual's health concerns and comorbidities may increase as obesity continues into adulthood. Not only is the person dealing with obesity, there may be other medical conditions such as type 2 diabetes related to obesity. The prevalence of type 2 diabetes and obesity continue to increase in the United States regardless of race, sex, or education levels (Ahn et al., 2012). An individual's health concerns and comorbidities may increase as obesity continues into adulthood (Paulitch et al., 2019).

Although individuals are diagnosed as obese, not every intervention is appropriate for every individual. Each individual must meet the health requirements of each interventions. Inventions care consist of bariatric surgery such as gastric bypass, laparoscopic sleeve gastrectomy, or

laparoscopic gastric banding. Other non-surgical interventions could be medications, combined with change in diet and daily exercise depending on other comorbidities associated with everyone.

While there are many approaches to treat obesity, little is known about the characteristics of those who pursue surgical treatment. To better understand treatment decisions, more research is needed to examine population characteristics of treatment groups.

1.3 Research Questions and Research Hypotheses

The objective of this research is to describe the Medicare population of with morbid obesity who pursue surgical interventions. Specifically asking, how do morbid obese patients who receive bariatric surgical interventions differ from those who do not?

The primary research question will examine the different characteristics (geographic region, age, sex, co-morbidities) between patients with a BMI greater than 40 with a sample of patients with a BMI greater than 40 who did not receive surgical interventions. The study is important for improving our understanding and characteristics of patients who undergo surgery. This is essential for identifying any racial, economic, and geographic barriers to access for this costly, but potentially life-saving types of care.

1.4 Population

The population examined with be individuals 65 years old or older who have Medicare insurance coverage. Each induvial will have obesity diagnosis defined by an ICD10 code diagnosis of obesity, which will typically classify them with a BMI greater than 40. The dataset includes a national 5% Medicare sample of 2017 Medicare claims data. We will use the 2017 Medicare 5%

Limited Data Set. The dataset includes a national 5% sample of 2017 all Medicare claims data for Part A and Part B services and is representative of the US Medicare population across all US states.

2 CHAPTER II SCOPING LITERATURE REVIEW

2.1 Background

According to the World Health Organization, obesity prevalence has doubled worldwide over the past 30 years and the increase in obese related comorbidities continue to rise. Comorbidities such as hypertension, coronary artery disease, cardiovascular disease and type II diabetes are among a few obesity related comorbidities especially those of 65 years old and older (Sues et al., 2017). The elderly population have a greater risk of obese comorbidities given that becoming older is another factor and making the risk even greater (Nevo et al., 2019).

Cardiovascular Disease

Koltuniuk and Rosinzuk (2011) completed a statistical analysis to compare cardiovascular disease (CVD) with patients 65 and over and patients in other age groups using student's t-test, chi-square test, fisher's exact test, Mann-Whitney U-test and analysis of variance. The leading cause of death in Poland is CVD and several risk factors are involved. The total number of patients studied were 420 who were hospitalized in surgical wards From September 2013-May2014. Abdominal obesity (36.2%), obesity (36.1%) were the most common CVD risk factors for patient 65 and over. The least common factors of CVD in patients 65 and over were diabetes mellitus (14.8%), depressive episodes (13.6%), abuse of alcohol (11.4%), and smoking (7.8%). In conclusion patients 65 and older with CVD were diagnosed with risk factors such as abdominal obesity, excessive body weight, impaired fasting glycemia and hypertension (Koltuniuk & Rosinzuk, 2011).

Diabetes/Cognitive regression

Ganguli et al., 2020, researched a population-based study with 478 adults 65 years old and older over up to a 10-year period. The study was to research diabetes and obesity with a cognitive regression. The Monongahela-Youghiogheny Healthy Aging Team is a population-based cohort of people aged 65 years and older recruited during 2006 to 2008 by age-stratified random sampling from voter registration lists in a small town in southwestern Pennsylvania. The study focused on the epidemiology of cognitive decline and dementia and everyone were assessed at study entry and at followed until end of 2014 who were still alive to participate in the study. The waist to hip (WHR) was used to measure central or abdominal obesity to determine whether obesity influences the associations of the metabolic indices with cognitive decline. The data found related to obesity showed no connection with individuals 88 and older with WHR or BMI obesity of cognitive decline. However, higher adiponectin level predicted steeper cognitive decline with individuals between the ages of 65 and 87 WHR group. This finding possibly reflects loss of body fat, which is known to be linked with aging and with increased risk of dementia (Ganguli et al., 2020).

Costs of Obesity Related Care in Geriatric Populations

Nguyen et al., (2016) researched the cost of patient over a course of 2011 with the diagnosis of obesity and mortality based on length of the hospital stay. The retrospective cohort had a population size of 1,763,000 and 50.6% hospitalizations had the mean age of 66.5 years old. The data was pulled from the Nationwide Inpatient Sample 2011. Obesity was chosen as a dichotomized variable. The percentage of 65 years old and older who had Medicare were 56.4% which was the highest percentage in this study. The length of stay was somewhat longer for obese septic patients compared to non-obese and this would increase the cost for overall stay.

Obese patients overall a higher prevalence in depression, psychosis, diabetes, hypertension, congestive heart failure among other comorbidities increased overall cost (Nguyen et al., 2016). Other studies have shown that as the level of BMI increased the greater cost increased with additional healthcare, medical and pharmacy, and in the increase of cardiometabolic conditions. In a salient retrospective cohort study, Sues et al., 2017, retrieved Medicare claims data of patients 65 and older using Body mass index (BMI) using ICD-9_CM status codes. Claims using ICD-9 code V85 had to be entered between January 1, 2008 and December 31, 2012. Of the 172,866 individuals who met the requirement 36.8% were classified as overweight and total of 42.5%. ICD-9-CM diagnosis codes were used to identify obesity and among patients that had Medicare the higher level of BMI the higher the cost associated with the study (Sues et al., 2017).

Medical Interventions in Geriatric Populations

Quirante et al., 2016, completed a retrospective review of a database from the Cleveland Florida of patients 65 years and older. This group was compared to a control group of patients younger than 65 who had bariatric surgery during 2011-2015 at the same clinic. Of the 1613 patients studied 393 were 65 years old or over. The surgeries consisted of one of the following: laparoscopic gastric banding, laparoscopic sleeve gastrectomy, laparoscopic Roux-en-Y gastric bypass, and laparoscopic revisions. The data compared with the two groups included demographics, BMI, post-surgical complications, and readmissions that occurred after surgery. Laparoscopic sleeve gastrectomy rated the highest chosen in both groups with the over the age of 65 and older totaling 164 (42%) and the lowest in both groups being the laparoscopic gastric banding totaling 43 (11%). The most significant difference in demographics between the groups were gender and race in both groups. Male patients and Caucasian were significant with 164

(42%) male and 326 (83%) being Caucasian in the 65 years old and older group. Preoperative BMI was comparable in both groups. The 65 year and older patients had more comorbidities such as hypertension, sleep apnea, hypercholesterolemia, but not significant difference with depression or type 2 diabetes. Length of stay in the hospital was greater than 1 day, but the readmittance rate after surgery was lower. The study showed that age did not play a factor with complications after bariatric surgery (Quirante et al., 2016).

Nevo et al., 2019, completed a study on laparoscopic sleeve gastrectomy in patients 65 years of age and older between May 2010 and November 2015. The study group was compared to a control group of patients younger than 65 years old. Sixty-six patients 65 years old or older had laparoscopic sleeve gastrectomy over the course of the 5 years. Comorbidities, such as hypertension, diabetes mellitus, dyslipidemia, and pulmonary pathology were significantly more in the patients 65 years of age and older. However, all areas showed improvement with less BMI during follow ups after the surgeries which ranged from 6 to 47 months (average being 17 months). Diabetes improved or resolved in 66.6% of patients, hypertension improved 56.2% of patients, hyperlipidemia improved 74.2% of patients and orthopedic complaints improved 82.3% of patients. The researchers found laparoscopic sleeve gastrectomy is the choice among surgeons due to the low mortality and morbidity rate and high efficacy. In conclusion, elderly patients that meet the criteria and are good candidates can benefit from having laparoscopic sleeve gastrectomy (Nevo et al., 2019).

Lainas et al., 2018, collected data on safety and short-term outcomes of laparoscopic sleeve gastrectomy for patients between the ages 65-75 years old. Fifty-four patients were chosen and

followed up in one year with a quality of life questionnaire, weight loss analysis, and co-morbidities evaluation. The data was collected between August 2010 and May 2016 and all patients went through a meticulous evaluation to determine if everyone would be appropriate for the procedure. Fifty-seven patient were chosen as candidates, however 3 refused surgery due to either cardiovascular morbidities or poor functional status. The remaining 54 candidates who were chosen had the laparoscopic sleeve gastrectomy without any issues. One hundred percent of patients followed up in 1 year and showed improvement. BMI decreased 38.6% after 3 months, and comorbidities of hypertension, type II diabetes, dyslipidemia, and sleep apnea showed significant improvement at 1 year follow up. Forty-eight (88.8%) patients completed the SF-36 questionnaire on quality of life based on preoperative and postoperative all areas showed significant improvements. The questions were based on physical function, role limitations, pain, vitality, social function, emotions and mental health. Overall, the study suggests Laparoscopic surgery with patients 65 and older is effective in all areas of weight loss, commodities, and quality of life (Lainas et al., 2018).

Policy Interventions

Medicare and Medicaid Services now include BMI measurement for incentive programs, electronic health records, and physician reporting (Sues et al., 2017).

Table 1: Summary of evidence for obesity interventions in geriatric patients

Intervention Type	Description	Risk Factors or Contraindications	Recommended in Geriatric Populations
Adjustable Gastric Banding	Weight loss by gastric restriction only A band creating a gastric pouch to upper part of the stomach	Longer recovery and length of stay	Yes
Gastric Bypass/Roux-en-Y Gastric Bypass	Weight loss by restriction and malabsorption Reduction of the stomach to a small gastric pouch	Longer recovery and length of stay	Yes
Laparoscopic Sleeve Gastrectomy	Sleeve resection of stomach while simultaneously reducing stomach volume At one time was step 1 in gastric bypass and is now a standalone surgery	Surgeons choice due to the low mortality and morbidity rate and high efficacy	Yes

3 CHAPTER III METHODOLOGY

Bariatric surgery has been shown to improve many aspects of health for patients with morbid obesity and surgery is covered by insurance for many patients. In 2006 the Centers for Medicare and Medicaid issued a decision statement that obese patients with a BMI of at least 35 who have been unsuccessful at other types of medical treatment for obesity and have at least one medical comorbidity are eligible to have open or laparoscopic Roux-en-Y gastric bypass (RYGBP), laparoscopic adjustable gastric banding (LAGB), and open and laparoscopic biliopancreatic diversion with duodenal switch (BPD/DS) procedures. However, most reports on bariatric surgery indicate that this surgery is most common for patients between the ages of 30 and 60 years. The use of bariatric surgery in the population eligible for Medicare because of age (65 and older) is not well described, and little is known about the characteristics of current Medicare patients who pursue surgical treatment. To better understand current use of bariatric surgery by aged Medicare beneficiaries, more research is needed that examine population characteristics of this treatment group.

3.1 Research Design or Method

The objective of this research is to describe the Medicare population of morbidly obese individuals who could potentially benefit from bariatric surgery and compare the characteristics of those who pursue surgical intervention with those who do not have surgery. Specifically asking, how do patients with morbid obesity who receive bariatric surgical interventions differ from those who do not? This study is important for improving our understanding of characteristics of patients who prefer surgery and are successful in access this treatment, and it is

essential for identifying any racial, economic, and geographic barriers to access for this costly, but potentially life-saving type of care.

3.2 Study Design

This is a retrospective cross-sectional study that will use archival billing data from Medicare patients to examine use of bariatric surgery. The primary research question will examine the different characteristics (geographic region, age, sex, co-morbidities) for all patients with a BMI greater than 40 who had bariatric surgery in 2017 compared to patients with a BMI greater than 40 who did not receive a surgical intervention. The MUSC IRB has deemed studies that use the proposed de-identified Medicare data set to meet the criteria for Non-human Research and therefore to require no patient informed consent or further IRB review.

3.3 Population

The population examined with be individuals 65 years and older who have Medicare coverage. Each individual will have diagnosis defined ICD10 code diagnosis of morbid obesity, which will typically classify them with a BMI greater than 40. To minimize the influence of major factors that may be expected to be contraindications for surgery in most patients, our study will exclude patients from the sample if they are older that age 85 or have a diagnosis code indicating dementia, cancer, substance abuse, paralysis or any record indicating hospices care.

3.4 Data Source

We will use the 2017 Medicare 5% Limited Data Set. The dataset includes a national 5% sample of 2017 all Medicare claims data for Part A and Part B services and is representative of the US Medicare population across all US states. An analytical data set will be constructed from

inpatient and outpatient service records. All patient records with a diagnosis code for morbid obesity (ICD-10 codes of E66.01) will be extracted. An unduplicated list of eligible patients will be constructed. Next, all records for this patient group for 2017 will be extracted. The extracted records will be used together with pre-validated SAS code libraries from the Comparative Effectiveness Data Analytics (CEDAR) to construct the study variables: age, sex, race, Dual Eligibility for Medicare and Medicaid, county of residence, comorbidity measures, frailty measure, measures needed for exclusion from the study and a use of preventive service measure.

The resulting data set will be merged with county-level variable present in the US Area Resource File. These variables will include rural/urban status, medically underserved designation, median household income, percent of households in poverty, percent of population of minority race. Once ineligible patients have been excluded, we will identify receipt of bariatric surgery by extracting all Part B payments records with CPT (43846, 43847,43644,43645, 43770,43775,) or ICD-10 procedure codes for open or laparoscopic Roux-en-Y gastric bypass (RYGBP), laparoscopic adjustable gastric banding (LAGB), and open and laparoscopic biliopancreatic diversion with duodenal switch (BPD/DS) procedures (Z98.84). A binary variable indication surgery=1 no surgery=0 will be constructed and merged onto the analytical patient-level data set. The following research questions will be examined using the resulting data set:
What are the differences between the surgery and non-surgery group in:

1. in patient demographics (age, sex, race),
2. comorbidity burden (diabetes, hypertension, heart disease, other comorbidities measured by the Charlson score, frailty),
3. economic access (dual Medicare-Medicaid coverage),

4. environmental factors (rural/urban residence, county characteristics such as medically underserved, median household income, percent in poverty, percent minority residents) and
5. personal history of treatment seeking behavior (use of Medicare preventive services).

4 CHAPTER IV RESULTS

4.1 Results/Findings

Study objective are to:

1) Use retrospective cross-sectional study that will use archival billing data from Medicare patients to examine use of bariatric surgery.

A total of 64,928 patients were examined across states who had Medicare with morbid obesity diagnosis in 2017. The majority were female (62.6%), followed by male (37.4%). The white race has the highest percentage (83.6%), followed by the black race (11.3%). The lowest percentage were other (3.5%), and Hispanic race at (1.6%). In the Medicare benefits and obesity diagnosis patients, 20.8% also had a diagnosis of diabetes with complications and 22.6% had a diagnosis of uncomplicated diabetes. In patients with diagnosis of morbid obesity, 15.4% were dual eligible for Medicare and Medicaid (Table 1). A total of 64,928 (2.2%) Medicare patients with a morbid obesity diagnosis, (2.2%) had any bariatric surgery in 2017 (Table 2).

Table 1: 2017 Descriptive Characteristics of Medicare Beneficiaries with Morbid Obesity Diagnosis

Variable Name n(%)	Total N=64,928
Sex	
Female	40,629 (62.6%)
Male	24,299 (37.4%)
Race	
Black	7,338 (11.3%)
Hispanic	1,009 (1.6%)
Other	2,276 (3.5%)
White	54,305 (83.6%)
Diabetes Complicated	13,516 (20.8%)
Diabetes Uncomplicated	146,641 (22.6%)
Dual Eligible	9998 (15.4%)

Table 2: Percentage of 2017 Patients who had Any Bariatric Surgery Performed

Variable Name n(%)	Total N=64,928
Any Bariatric Surgery	1,417 (2.2%)

Out of the total of 1.1417 patients who had bariatric surgery (34.6%) had the surgery in 2017 and (65.4%) had bariatric surgery in a previous year (Table 3).

Table 3: Any Bariatric Surgery By Year

Variable Name n (%)	Total N=1,417
Bariatric Surgery in 2017	490 (34.6%)
Bariatric Surgery in a Previous Year	927 (65.4%)

Table 4: Comparison of Characteristics Between Patients Who Received Any Bariatric Surgery and Those Who Did Not

Variable Name	No Bariatric Surgery N=63,511	Any Bariatric Surgery N=1,417	Statistic
Age Mean (SD)	68.4 (3.5)	71.5 (5.8)	<.0001
Sex			<.0001
Female	39,599 (62.3%)	1,030 (72.7%%)	
Male	23,912 (37.6%)	387 (27.3%%)	
Race			P=0.0002
Black	7,220 (11.4%)	118 (8.3%)	
Hispanic	998 (1.57%)	11 (0.78%)	
Other	2,229 (3.51%)	47 (3.3%)	
White	53,064 (83.6%)	1241 (87. 6%)	
Diabetes Complicated	13,278 (20.9%)	238 (16.8%)	P=0.0002
Diabetes Uncomplicated	14,235 (22.4%)	406 (28.7%)	<.0001
Dual Eligible	9,853 (15.5%)	145 (10.2%)	<.0001

Of the 1417 people who received any bariatric surgery, the majority were female 72.7% (p<0.0001) (Table 4). The white race made up the highest percentage of patients receiving any bariatric surgery (87.6%), followed by black race at 8.3% followed by other at 3.3% and the lowest being Hispanic race at 0.78% (P=0.0002). In patients who were dual eligible for both Medicare and Medicaid, 10.2% received bariatric surgery (P<0.0001). In patients with diabetes complicated, 16.8% receiving any bariatric surgery and 28.7% of patients with a diabetes uncomplicated diagnosis received any bariatric surgery. Compared to patients who did not receive bariatric surgery, the surgery cohort had significantly more women (p<.0001), more white patients (.0002), more patients with uncomplicated diabetes (<.0001), and fewer patients who were so poor that the are dually eligible for Medicare and Medicaid.

Table 5: Likelihood of Receiving Any Bariatric Surgery

Variable Name	Odds Ratio	CI	Statistic
Age	0.881	0.869-0.892	<0.0001
Female	1.740	1.544-1.961	<0.0001
Race (white is reference group)			
Black*	0.648	0.534-0.786	0.1605*
Hispanic	0.598	0.326-1.097	0.3171
Other	0.845	0.628-1.136	0.4223
Dual	0.615	0.515-0.735	<0.0001
Diabetes Complicated	0.809	0.702-0.932	P=0.0033
Diabetes Uncomplicated	1.421	1.263-1.599	<0.0001

*Black race is significant OR 0.659 (CI 0.543-0.799 p<.0001 when compared to all other races.

In the multivariate analysis, increasing age was associated with lower odds of receiving bariatric surgery (OR 0.881, CI 0.869-0.892). In female patients with morbid obesity diagnosis, the odds of having bariatric surgery are approximately 1.7 times greater. Compared to white, Hispanic and other race patients, black race was associated with significantly lower likelihood of getting bariatric surgery. Black patients were 35% less likely than white patients to receive surgery but this association was only statistically significant when compared to all other racial groups. Patients who were dually eligible for Medicare and Medicaid (poor patients) were 38.5% less likely than Medicare patients with higher income to receive surgery. Patients with uncomplicated

diabetes were 19.1% more likely that patients without diabetes to receive surgery, after controlling for demographics and other factors.

We observed substantial geographic variations in the rate of bariatric surgery across all US states (data not shown). The mean rate for the 52 states was 2.2 percent, and most states had rates of one or two percent. Only six states had rates above three percent, these were in descending order: Wyoming 7.5%; Oregon 4.6%; Maine 3.8%; Delaware 3.4%; New Mexico 3.1%; Nevada 3.0%. All the remaining states had surgery rates below 3%.

5 CHAPTER V DISCUSSION

5.1 Discussion of Results

In a 5% sample of Medicare beneficiaries in 2017 we identified of 64,928 patients with morbid obesity diagnosis in 2017. Of these patients, 1,1417 (2.2%) had bariatric surgery; 490 (34.6%) had the surgery in 2017, and another 927 (65.4%) had their surgery in a year prior to 2017, as indicated by an ICD- 10 code for previous surgery. Surgery was not equally distributed in the population. We found distribution of population characteristics that may indicate some disparities in access to this important, potentially, life-changing intervention. Older Medicare patients, poor patients who are dually eligible for Medicare and Medicaid, patients with severe diabetes with complications, and minority racial groups had lower odds of having a record of

current or previous surgery. White patients, patients with uncomplicated diabetes, and younger patients appeared to have significantly better access to surgery that their counterparts.

An individual's health concerns and comorbidities may increase as obesity continues into adulthood. Not only is the person dealing with obesity, there may be other medical conditions such as type 2 diabetes related to obesity. The prevalence of type 2 diabetes and obesity continue to increase in the United States regardless of race, sex, or education levels (Ahn et al., 2012). Research has shown that patients who had complicated diabetes were less likely to have bariatric surgery than those patients with uncomplicated diabetes. Prior research also has shown that diabetes improved after bariatric surgery, the decline in patients' health due to diabetes made them less likely to choose bariatric surgery. An individual's health concerns and comorbidities may increase as obesity continues into adulthood (Paulitch et al., 2019). The literature suggests that females are generally more likely to receive bariatric surgery. Our findings within the Medicare population found similar results, as the odds of females receiving bariatric surgery were significantly higher compared to males. In addition, we also found that dual eligible beneficiaries were less likely to receive bariatric surgery. There are several possible explanations for this difference. It is possible that dual eligible patients have additional comorbidities, making them ineligible for bariatric surgery. In addition, they may have less access to convenient surgery or decreased awareness of bariatric surgery. More research is needed to identify the exact drivers of this disparity.

Therefore, reimbursement policy and the risks and benefits of bariatric surgery should be detailed for patients who have Medicare and for those dual eligible beneficiaries to know if they have coverage for the surgery. Larger hospitals systems require an orientation to discuss bariatric

surgeries and educational sessions covering the details this kind of surgery. The list of requirements to begin the initial assessment and proceed the next step of the bariatric surgery process includes, meeting weight requirement, lab work, and reason why the patient wants to have bariatric surgery. Some may require a psychological evaluation to ensure each patient is mentally stable to maintain and be successful at this type of surgery. This step should be a requirement due to some patients at any age use food as a coping mechanism and if a patient's mindset is not in a good place bariatric surgery will only be a short-term solution and not a long-term lifestyle change. Each patient should be assessed and meet several requirements before surgery is an option.

5.2 Limitations

The biggest limitation was only using archival billing data from Medicare patients to examine use of bariatric surgery, the results may not be generalizable to other age groups or payer types. In addition, there is the potential for coding errors in the claims data. However, billing compliance and quality assurance audits mitigate the chances of errors. Finally, the data limits our ability to examine all possible characteristics and we could not assess factors such as provider willingness to operate on geriatric populations or patient access to convenient treatment settings.

5.3 Future Research

Given the evidence that bariatric surgery is a safe and effective treatment in morbidly obese geriatric populations, more research is needed to identify the facilitators and barriers to surgery on both the patient and provider side. More research on patients who are morbidly obese in the

geriatric population who have the determination to choose a lifestyle change such as exercise and food choices vs those who choose to have bariatric surgery and still obtain the same results in overall quality of life.

5.4 Conclusions

This study of Medicare patients with a diagnosis of morbid obesity found a surprisingly low percent of patients who had ever had bariatric surgery or who had surgery in 2017. It appears that surgery may be underutilized, especially for black patients, older individuals, poor patients and those with diabetic complications. Use of this safe and effective treatment is approved by Medicare, but rates of use vary greatly by patient characteristics and geographic location. Much additional work needs to be done to identify barriers to care. This is especially important for addressing the current economic, racial and age imbalance in those who gets surgery and those who do not.

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