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COMPARATIVE ANALYSIS OF BARIATRIC SURGERY TECHNIQUES: A SYSTEMATIC REVIEW

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ABSTRACT:

Background: Bariatric surgery is a surgical intervention aimed at aiding patients in weight loss, primarily recommended for individuals with severe obesity who have failed to lose weight through conventional methods such as diet and exercise. While bariatric surgery is generally considered safe and effective, it is a complex treatment involving significant dietary and lifestyle modifications. However, there is a potential for adverse effects post-surgery, necessitating a thorough understanding of warning signs and risk factors.

Objective: The objective of this study was to systematically review the literature to identify warning signs and risk factors associated with adverse outcomes following bariatric surgery.

Methods: A systematic review was conducted using the Medical Literature Analysis and Retrieval System Online (Medline) and the Latin American and Caribbean Literature in Health Sciences (Lilacs) database. Qualitative analysis of the retrieved data was performed to identify risk variables and warning signs.

Results: The review identified several risk variables associated with adverse outcomes following bariatric surgery, including genetics, anxiety, excessive intake of sweets, psychological factors influencing eating behavior, disordered eating patterns, lack of control/disinhibition in eating, and postoperative stomach volume changes. Notably, rapid weight loss following surgery raised concerns regarding the potential development of biliary issues, which could lead to morbidity, readmission, reoperation, or other complications.

Conclusion: This systematic review highlights the importance of recognizing warning signs and risk factors for adverse outcomes following bariatric surgery. Healthcare professionals should be vigilant in monitoring patients postoperatively and implementing appropriate interventions to mitigate potential risks and optimize patient outcomes.

KEYWORDS: Obesity; Bariatric Surgery; Risk Factors.

INTRODUCTION:

A type of surgery known as bariatric surgery, or a procedure for weight loss, is intended to assist patients who are obese in losing weight. If all other attempts at weight loss have failed and bariatric surgery seems to be a better option given the health risks associated with obesity, medical professionals may suggest it. By altering the digestive tract, primarily the stomach but occasionally the tiny intestine, bariatric surgical methods control the amount of calories a patient may ingest and absorb (Jaeger, Mortier, Alhazmi, Gaeb, & Senkal, 2024; Mentias et al., 2024; Nakanishi et al., 2024). Additionally, they can lessen hunger signals that reach the brain via the digestive system. Numerous metabolic illnesses linked to obesity, such as glucose and cirrhosis of the liver, can be treated and prevented with the aid of these methods. However, losing weight through surgery is not a straightforward "quick fix"; long-term lifestyle modifications and proactive planning are necessary for success (Hughes et al., 2024; Schiavon et al., 2024).

While it is nearly impossible for persons with Class III obesity to maintain a reduction in weight with diet and physical activity alone, surgery to lose weight is the most effective long-term treatment for the condition (Blanco et al. Once the patient's body accepts the more significant weight as "average," it keeps attempting to get back to that weight. By altering how the body processes food, bariatric surgery enables patients to make beneficial dietary and lifestyle adjustments that will result in long-term weight loss and improved health (MacVicar et al., 2024; Soheilipour & Geram, 2024; Ying et al., 2024).

Numerous chronic illnesses, many of which have a high mortality rate, are linked to obesity. Procedures and weight loss significantly improve these illnesses and risk factors. One or more of the following conditions could be present in your patient if they are a candidate for bariatric surgery: elevated blood sugar levels, high blood pressure, elevated cholesterol levels, coronary artery disease, kidney problems, obstructive apnea nocturnal, developing osteoarthritis non-alcohol-related disease of the liver, cancer, and heart disease. Most weight loss surgeries use minimally invasive techniques, such as laparoscopic surgery (Alsaqaaby et al., 2024; Gunka et al., 2024; Perez, Neag, Sridhar, & Williams Jr, 2024).

Compared to open surgery, this results in fewer incisions, quicker recovery, and decreased pain and scars. Rarely, a patient's unique disease may require open surgery to be addressed appropriately. Notwithstanding the advantages and restrictions of bariatric surgery, it's crucial to consider the hazards involved in the procedure and any potential aftereffects. In light of these concepts, the study aimed to consider the risk factors associated with bariatric surgery (Pletch & Lidor, 2024; White, Steers, Bernardi, & Kalarchian, 2024).

Table: Studies on Bariatric Surgery and Its Effects

Study	**Summary**
(Jaeger, Mortier, Alhazmi, Gaeb, & Senkal, 2024)	Bariatric surgery is a weight loss procedure intended for obese patients. It alters the digestive tract to control calorie intake and hunger signals, potentially treating metabolic illnesses.
(Mentias et al., 2024)	Bariatric surgery can help prevent and treat metabolic diseases associated with obesity. Long-term lifestyle changes are essential for successful weight loss post-surgery.
(Nakanishi et al., 2024)	Surgery is the most effective long-term treatment for Class III obesity, as it helps patients make lasting dietary and lifestyle changes.

Study	Summary
(Hughes et al., 2024)	Successful weight loss through surgery requires proactive planning and long-term lifestyle modifications.
(Schiavon et al., (Blanco et al. 2024)	Bariatric surgery enables patients to achieve long-term weight loss and improved health by altering how the body processes food. Surgery helps patients maintain weight loss by changing their body's perception of "average" weight and facilitating beneficial dietary and lifestyle changes.
(MacVicar et al., 2024)	Weight loss surgery significantly improves chronic illnesses and risk factors associated with obesity.
(Soheilipour & Geram, 2024)	Candidates for bariatric surgery often have comorbidities such as elevated blood sugar, high blood pressure, and heart disease, which can be improved with weight loss surgery.
(Ying et al., 2024)	Minimally invasive bariatric surgery techniques, such as laparoscopic surgery, offer advantages such as quicker recovery and reduced pain compared to open surgery.
(Alsaqaaby et al., 2024)	Laparoscopic bariatric surgery is the preferred method due to its benefits in recovery and pain management, but open surgery may be necessary for specific cases.
(Gunka et al., 2024)	Despite the benefits, it's essential to consider the risks and potential complications associated with bariatric surgery.
(Perez, Neag, Sridhar, & Williams Jr, 2024)	Understanding risk factors associated with bariatric surgery is crucial for optimizing patient outcomes and minimizing complications.
(Pletch & Lidor, 2024)	Bariatric surgery carries risks, and identifying potential risk factors is essential for patient safety and informed decision-making.
(White, Steers, Bernardi, & Kalarchian, 2024)	Comprehensive consideration of risks and benefits is necessary when considering bariatric surgery as a treatment option for obesity.

METHODOLOGY:

A comprehensive evaluation of previously published studies on risk factors for bariatric surgery was carried out using the databases Medical Literature Analysis and Retrieval System Online (Medline) and Latin American and Caribbean Literature in Health Sciences (Lilacs). For this search, the subsequent variables were applied: "Risk factors," "Bariatric surgery," and "obesity" (Boppre, 2024; Kokkinos et al., 2024; Zhao et al., 2024).

The inclusion criteria included primary studies published between the years 2017 and 2022 in total. Those integrative, narrative or systematic review studies were excluded, with full text and duplicates unavailable (Eymard & Aron-Wisnewsky, 2024; Fiorotti et al., 2024).

For data analysis, the titles of the selected texts were read critically, extracting their primary information (author, year, title, objective, method and results), displayed in Table 1, after the

following flow diagram (Figure 1). From this, the results were discussed to achieve the objective proposed in this study (Łabul et al., 2024; Wu, Zhao, Zhu, & Da, 2024).

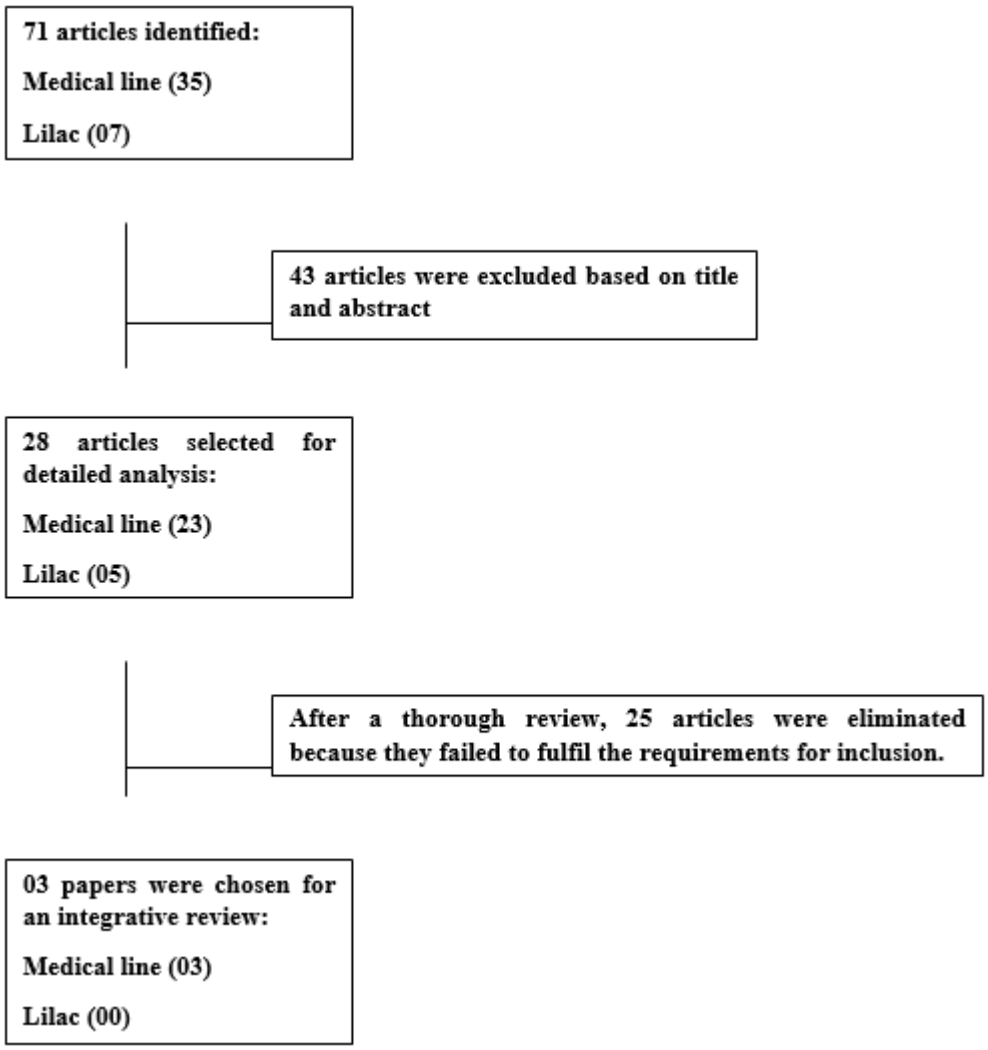

***Figure 1: A** diagram showing the research studies that were chosen for the systematic review – January/2023*

RESULTS:

Three studies were chosen after the inclusion and exclusion criteria were applied. The primary data for these works is displayed in Table 1 below (Patel et al., 2024; Rahimi, Soliman, Hsu, & Ghaderi, 2024; Sanders & Vosburg, 2024).

AUTHOR/YEAR	TITLE	OBJECTIVE	METHODOLOGY	RESULTS
Athanasiadis et al. 2021	Gallstone prevalence, indicators of risk, and outcomes following bariatric surgery	To assess the likelihood of bodyweight regain (WR) following bariatric surgery and its risk variables.	Observational study	Five groups comprise the variables associated with VR: physical, genetic, nutritional, mental, and spatial. In particular, postprandial GLP-1, a desire to alter physical activity habits, esteem for oneself, societal

				support, fruit and zinc intake, HDL, the standard of life, and genetic factors have been negatively correlated with WR, while gastric-jejunal diameter, the volume of the gastric tract shortly after mango, nervousness, time after surgical procedures, sweet intake, emotional snacking, size of portions, food desires, excessive eating, diminished control/disinhibition while consuming food, and genetic factors have been favorably correlated.
Guzmán et al. 2019	Gallstone prevalence and associated risks following bariatric surgery	To ascertain the risk variables for gallstone formation and the prevalence of CL in obese Chilean individuals 12 months following CB.	Retrospective study	Up to one-third of individuals monitored for a year following CB had an incidence of LC. The risk was not increased by excessive weight reduction or other factors under investigation. Gallstone production seems to be prevented by elevated blood pressure, although further research is needed to confirm this finding.
Verhoeff et al. 2022	An examination of MBSAQIP data to characterize the risk variables for early biliary problems following elective bariatric surgery	Summarize any biliary issues that may arise up to 30 days following bariatric surgery and identify the risk factors for those complications.	Comparative study	Although they are uncommon, early biliary problems following bariatric surgery significantly increase morbidity. The most vital indicators of early gastrointestinal problems include female sex, postoperatively weight loss, and RYGB. It is essential to assess preventive

				interventions in these high-risk categories.

Table 1 *– Distribution of the results of the selected articles*

DISCUSSION:

This study found five risk factors for weight gain: anatomical, genetic, nutritional, mental, and temporal. The following factors were found to be associated positively with postprandial GLP: genetics, decreased appetite control/disinhibition during food consumption, sweet consuming food, emotional snacking, size of portions, eating desires, binge eating, gastrojejunal stoma width, post-sleeve stomach volume, anxiety, and time after surgery (Guareschi, Brandner, Eichinger, & Friedman, 2024; Maghsoodlo et al., 2024).

Weight loss procedures are the most successful approach for endured reduction in weight in morbidly obese patients, according to a study by Athanasiadis et al., but regain of weight following surgery is still a concern. The study assessed weight gain's probability and risk variables shortly after bariatric surgery (Ahima & Park, 2024; Ragavan et al., 2024).

Negative correlations were found between earnings, willingness to modify physical activity habits, self-esteem, social support, consumption of fruit and zinc, HDL, and quality of life. Athanasiadis et al.'s investigation also identifies underlying issues linked to multifactorial factors, necessitating a methodical strategy to lessen or avoid weight regain in the community following bariatric surgery (Bhanushali et al., 2024; Elhelw et al., 2024; Mitra et al., 2024).

Given this, they recommended investigating the relative effects of different factors associated with weight regain, employing a clinically significant weight regain standardized method, and determining which techniques are most effective in addressing the reasons causing weight regain following bariatric surgery (Chumakova-Orin et al., 2024; Kapoor, 2024; Peña-García et al., 2024).

Guzmánetal thinks two risk factors for gallstone development are obesity and quick weight loss following bariatric surgery. Gallstones occurred in up to one-third of the individuals in this retrospective analysis of bariatric surgery patients who were followed up for a year following the procedure (Nedelcut, Axer, & Olbers, 2024; Paone et al., 2024).

There were no pre- or postoperative indicators of risk for the development of gallstones, and weight loss did not raise the risk. Furthermore, it was mentioned that hypertension might be protective against the development of gallstones. However, this conclusion needs more investigation. According to Guzmán et al., these results may prompt consideration of UDA as a post-bariatric surgery preventive intervention against gallstones; nevertheless, the patient's dedication to this treatment and associated expenses make its efficacy in patients improbable (Ghusn et al., 2024; Visaggi et al., 2024).

Individuals following bariatric surgery are susceptible to postoperative biliary problems, according to research by Verhoeff et al. This study compared patients with and without early biliary problems by analyzing a database from the Bariatric and Metabolic Surgery Accreditation and Quality Improvement Program (MBSAQIP) 2015-2019 (Alzahrani, Alsoliman, Alattiah, & Almohussein, 2024; Yassin et al., 2024).

Any reoperation, readmission, or reoperation for gallstones within a month following surgery was considered an early sign of biliary problems. Individuals who experienced early biliary difficulties were more likely to be early women and needed a great deal more readmissions, reoperations, and reoperations overall. Preoperative weight reduction and female sex were significant indicators of early biliary problems (Yuan, Bangalore, Darwish, Moon, & Wadhwa, 2024).

Verhoeff et al. deduced from these results that early biliary problems following bariatric surgery are uncommon but significantly increase morbidity. Preoperative weight loss, female sex, and RYGB are the most reliable indicators of early biliary problems. It is essential to assess preventive interventions in these high-risk categories (Kissmann et al., 2024; Osińska & Walicka, 2024).

Final Considerations:

Considerable long-term loss of weight and the reduction of obesity-related comorbidities are both possible with bariatric surgery. Customizable gastric stripes, Sleeve Gastrointestinal Surgery, Roux-en-Y gastric bypass surgery, biliopancreatic diverting procedure with or without an intestinal switch, or single anastomotic bypass of the stomach are among the bariatric surgical treatments currently accessible. The information now available about the procedure's length, the likelihood of both short and long-term negative consequences, such as mortality, and the effectiveness of weight loss outcomes influences the decision to go through with bariatric surgery and, consequently, the choice between different forms of surgery.

We qualitatively evaluated the systematic review results to reflect on the risk variables associated with bariatric surgery. Based on our findings, there are several risk factors, including genetics, anxiety, sweets consumption, impulsive eating, excessive food intake, loss of control/disinhibition in eating, and gastric volume after a mango. Quick weight loss following surgery draws attention to the remote chance of biliary issues following surgery, which might cause morbidity or necessitate readmission, reoperation, or both.

It is understood that it is necessary to conduct new studies on this topic to prevent these risks, and the new knowledge produced in this regard will be relevant both for healthcare professionals working in this area and for patients undergoing bariatric surgery.

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