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Overview and Prevalence of Eating Disorder in Post-Bariatric Surgery Patients: A Single Center Observational Study at Sumber Waras Hospital, Jakarta, Indonesia

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A B S T R A C T

Introduction: The prevalence of obesity continues to increase, and society needs to pay attention to it. One effective treatment that is also included in the pillars of obesity management is bariatric surgery. Apart from the many benefits of bariatric surgery, there are side effects that need to be considered, one of which is eating disorders. This study aims to determine the prevalence of eating disorders in post-bariatric surgery patients in Indonesia, especially at Sumber Waras Hospital, Jakarta. **Methods.** This research is a descriptive study with cross-sectional methods in post-bariatric surgery patients with a minimum BMI of 30 kg/m^2. **Results.** A total of 54 patients after bariatric surgery at Sumber Waras Hospital, Jakarta filled out a questionnaire to assess tendencies towards eating disorders, namely EDE-Q 6.0 (Eating Disorder Examination Questionnaire) after 6 months of undergoing bariatric surgery. The results showed that 17 respondents (31.48%) experienced eating disorder tendencies. **Conclusion.** Eating disorders are one of the side effects of bariatric surgery that needs to be considered. Further research is still needed on this matter, considering the small number of samples in this study. Research on related topics is expected to expand its reach so might obtain a larger sample size.

1. Introduction

Obesity is a health problem that is often overlooked by society. Without realizing it, the prevalence of obesity, especially in Indonesia, continues to increase. In 2013, the estimated prevalence of obesity in adults was 28.9%. As time goes by, in 2018, around 14.8% of teenagers and 35.5% of adults were obese. It is recorded that more adult women live with obesity (44.4%) compared to adult men (26.6%).[1] The prevalence rate of severe obesity is also increasing and is estimated to double from 10% to 20% by 2035.[2] This is a significant increase. Of course, it needs special attention from the public.

The impact of obesity can manifest in various diseases, both acute and chronic. Regarding cardiovascular disease, obesity has the risk of causing hypertension, atherosclerosis, stroke, arrhythmia, and even heart failure, which can lead to death. Regarding body metabolism, obesity leads to type 2 diabetes mellitus, dyslipidemia, and non-alcoholic fatty liver disease. It also causes many diseases in various other aspects, such as degenerative arthritis, polycystic ovarian syndrome (especially in women), kidney failure, and even psychosocial disorders.[3]

Obesity-related diseases can be avoided if they are handled correctly. One procedure that is quite popular is bariatric surgery. Not only is it popular among the public, but bariatric procedures have also become one of the pillars of management for severe obesity. Based on research[4], it is stated that bariatric surgery can

reduce the risk of death from obesity-related diseases by 89%. Apart from that, bariatric surgery also promotes better health conditions. This, of course, makes bariatric surgery a compelling choice of action for treating obesity in society.

Behind the many benefits of bariatric surgery, several side effects can occur. Digestive problems such as dumping syndrome, which can cause dizziness, nausea, vomiting, weakness, fatigue, sweating, and diarrhea; apart from that, changes in eating behavior, such as not chewing properly or vomiting spontaneously, have also been reported. In one study[5], it was also reported that there were eating disorders in patients after bariatric surgery, more specifically, anorexia nervosa and bulimia nervosa. However, this data has not been carried out on people in Indonesia. Thus, researchers want to prove whether there is a tendency toward eating disorders in patients after bariatric surgery at a hospital in Indonesia.

2. Methods

The design of this research is descriptive research with a cross-sectional study. This research was conducted using an online Google Form questionnaire over 4 months from 1 January 2024 to 30 April 2024. This research was attended by 55 post-bariatric surgery patients who met the inclusion criteria. In this study, respondents filled out a personal data questionnaire and an eating disorder tendency questionnaire (EDE-Q 6.0). The questionnaire contains informed consent, personal identity, and 32 questions to assess tendencies towards eating disorders at 28 days after 6 months of undergoing bariatric surgery, which is divided into 5 parts. The research was carried out based on considering the ethical committee for health assessment of the faculty of medicine, Tarumanagara University No. 251/KEPK/FK UNTAR/XII/2023

There are 7 answer options in the first part, with choices 0 (never), 1 (1-5 days), 2 (6-12 days), 3 (13-15 days), 4 (16-22 days), 5 (23-27 days), and 6 (every day). In the second part, the questionnaire is answered with short answers. In the third part, the questionnaire was answered with the options 0 (never), 1 (1-5 days), 2 (6-12 days), 3 (13-15 days), 4 (16-22 days), 5 (23- 27 days), and 6 (every day). In the fourth section, the questionnaire is answered on a scale of 0-6, with 0 being "not at all" and 6 being "extremely". In the fifth section, the questionnaire is answered with short answers. Researchers will then process the data obtained using global assessment criteria of the eating disorder examination questionnaire 6.0. The presentation of statistical data in this research focuses on presenting proportion data (%) for qualitative data and centralized data distribution (mean/standard deviation) for quantitative data.

3. Results

The number of respondents in this study was 54 respondents. Table 1 describes respondents' characteristics, including gender, age, body weight, body height, and body mass index (BMI). Based on age group, the largest group was 40-49 years old, with 27 respondents (50%). Based on body weight, the largest group was 70-79 kg, with 18 respondents (33.33%). Based on height, the largest group was 160-169 cm, with 24 respondents (44.44%). Based on the WHO Asia Pacific body mass index classification[6], the largest group was obese 1, with 25 respondents (46.29%). Based on the type of bariatric surgery, the most common are sleeve procedures (51.85%), and the least are gastric balloon procedures (3.70%). The prevalence of the type of bariatric surgery can be seen in Table 2.

Tendency of having eating disorders Based on the Eating Disorder Examination Questionnaire 6.0, 31.48% tend to have eating disorders, and 68.52% do not tend to have eating disorders. The overview of eating disorder tendencies is shown in Table 3. Among the 17 respondents who tend to have eating disorders after bariatric surgery, all of them are female, with the largest age group being 40-49 years old. Further details on the characteristics of those respondents are shown in Table 4.

Based on the type of bariatric surgery, the procedure that has the highest tendencies of eating disorders is endoscopic sleeve gastroplasty, followed

by single anastomosis duodeno-ileal bypass with sleeve gastrectomy and roux-en-y**.** The prevalence of eating disorders in each type of bariatric surgery can be seen in Table 5.

Table 1. Characteristics of respondents (n = 54).

	Total	**Percentage (%)**	**Mean (SD)**	**Min**	**Max**
Gender					
Women	44	81.49			
Men	10	18.51			
Age (Years)			41.85 (± 8.746)	24	61
20-29	5	9.27			
30-39	12	22.22			
40-49	27	50.00			
50-59	8	14.82			
60-69	2	3.70			
Body weight (kg)			70.26 (± 13.252)	46.75	104
40-49	3	5.56			
50-59	9	16.67			
60-69	14	25.92			
70-79	18	33.33			
80-89	5	9.27			
90-99	4	7.40			
100-109	1	1.85			
Body height (cm)			162.20 (± 7.996)	150	186
150-159	22	40.74			
160-169	24	44.44			
170-179	5	9.26			
180-189	3	5.56			
BMI classifications based on WHO Asia Pacific					
Underweight	2	3.70			
Normal	8	14.82			
Overweight	8	14.82			
Obese 1	25	46.29			
Obese 2	11	20.37			

Table 2. The prevalence of the type of bariatric surgery (n = 54).

Type of bariatric surgery	**Total**	**Percentage (%)**
Gastric balloon	2	3.70
Endoscopic sleeve gastroplasty	3	5.55
Single anastomosis duodeno-ileal bypass with sleeve gastrectomy	5	9.25
Roux-en-y gastric bypass	16	29.62
Sleeve gastrectomy	28	51.85

Table 3. Eating disorder tendencies based on eating disorder examination questionnaire 6.0 (n = 54).

Eating disorder tendencies	**Total**	**Percentage (%)**
EDE-Q 6.0		
Tend to have eating disorders	17	31.48
Do not tend to have eating disorders	37	68.52

Table 4. Characteristics of respondents that tend to have eating disorders (n = 17).

	Total (%)	Mean (SD)	Min	Max
Gender				
Women	17 (100)			
Men	0 (0)			
Age (years)		38.18 (± 7.170)	24	47
20-29	2 (11.77)			
30-39	5 (29.41)			
40-49	10 (58.82)			

Table 5. Tendencies of eating disorders in each type of bariatric surgery (n = 54).

Type of bariatric surgery	Total (%)	Tend to Have eating disorder (%)	Do not tend to have eating disorders (%)
Gastric balloon	2 (3.70)	0 (0)	2 (100)
Endoscopic sleeve gastroplasty	3 (5.55)	2 (66.67)	1 (33.34)
Single anastomosis duodeno-ileal bypass with sleeve gastrectomy	5 (9.25)	2 (40.00)	3 (60.00)
Roux-en-y gastric bypass	16 (29.62)	6 (37.50)	10 (62.50)
Sleeve gastrectomy	28 (51.85)	7 (25.00)	21 (75.00)

4. Discussion

There were 54 respondents in the study, with 44 (81.49%) women and 10 (18.51%) men. This is in line with Young's research[7] in Chicago (2016), which stated that most patients undergoing bariatric surgery were women, with a comparison of 80.7% being women and 19.3% being men. The age range in this study was 24 to 61 years, with the average respondent being 41.85 years old. Based on a systematic literature review conducted by Eisenberg et al.[8] stated that there is no age limit for bariatric surgery. However, it is essential to consider other factors, such as assessing frailty and health conditions, especially for the elderly undergoing bariatric surgery. Based on the WHO BMI classification for Asia Pacific[6], 6 months after bariatric surgery, the largest group was obese 1 among respondents in this study. This is following Nedeljkovic-Arsenovic's research[9] on bariatric surgery patients in Belgrade, Serbia, in 2019, which stated that the average BMI after 6 months of undergoing bariatric surgery was 33.78 kg/m^2, which is classified as obese 1 by the BMI classification intended for European society, namely the WHO International BMI classification.[6]

In this study, the most frequently performed type of bariatric surgery was sleeve gastrectomy, 51.85% (28/54), and roux-en-y gastric bypass, 29.62% (16/54). This is in line with research conducted by Topart[10], which stated that sleeve gastrectomy is the most common procedure performed throughout the world, followed by Roux-en-y gastric bypass, which is still recommended, especially for obese sufferers with comorbidities. Other studies[11] also confirm that sleeve gastrectomy is easier to perform and has no less than roux-en-y gastric bypass results.

Other types of procedures in this study, such as single anastomosis duodeno-ileal bypass with sleeve gastrectomy, had a lower prevalence than sleeve gastrectomy or roux-en-y gastric bypass. Five respondents underwent a single anastomosis duodeno-ileal bypass with sleeve gastrectomy. Pennestrì et al.[12] believe that the single anastomosis duodeno-ileal bypass with sleeve gastrectomy action is considered quite effective and safe to carry out. Another study by Sánchez-Pernaute[13] also confirmed that the long-term single anastomosis duodeno-ileal bypass with sleeve gastrectomy action showed satisfactory weight reduction and improved comorbid diseases. On the other hand, a retrospective cohort

study conducted by Verhoeff[14] on 47,375 patients after bariatric surgery comparing the single anastomosis duodeno-ileal bypass with sleeve gastrectomy technique with roux-en-y showed that patients who underwent single anastomosis duodeno-ileal bypass with sleeve gastrectomy procedures experienced more metabolic comorbidities such as anastomotic leakage, pneumonia, more frequently experienced sepsis as well as showing worse perioperative outcomes. We suspect that this causes the prevalence of single anastomosis duodeno-ileal bypass with sleeve gastrectomy to be less.

Three respondents carried out the endoscopic sleeve gastroplasty procedure, and two carried out the gastric balloon procedure. A systematic review and meta-analysis by Marincola et al.[15] in 2021 explained that sleeve gastrectomy provides better weight loss results than endoscopic sleeve gastroplasty. Meanwhile, a similar study conducted by Koziowska-Petriczko[16], comparing gastric balloon and sleeve gastrectomy, also confirmed that sleeve gastrectomy was superior in weight loss. The studies above explain why endoscopic gastric gastroplasty and gastric balloon bariatric surgery are less frequently performed.

Assessment of eating disorder tendencies based on the eating disorder examination questionnaire 6.0, which was carried out on 54 post-bariatric surgery patients who were willing to be respondents, showed that 31.48% (17/54) tended to experience eating disorders and 68.52% (37/54) did not have a tendency to eat disorders. This shows the possibility of eating disorders as one of the complications that arise after bariatric surgery. A systemic review and meta-analysis conducted by Taba et al.[17] shows that the prevalence of eating disorders after bariatric surgery is 7.83%. Research conducted by Ivezaj V et al.[18] stated that post-bariatric surgery patients can take actions such as chewing food and spitting it out again so that it is not swallowed to avoid weight gain, get an ideal body shape, or to get pleasure or get the taste of the food. Conceição et al.[19] also explained that significant weight loss, strict diet control, and controlling the amount of food that is important for the success of bariatric procedures as a treatment for severe obesity could trigger the emergence of eating disorders.

In this study, of the 17 respondents who had eating disorder tendencies, it was found that all of them were female. This is supported by a narrative review conducted by Breton et al.[20], which stated that the prevalence of eating disorders was found to be higher in women compared to men. Reviewed by age group, 10 respondents (58.82%) were aged 40-49. This is in line with research conducted by Ward et al.[21], who state that eating disorders usually appear around the age of 40; in most cases, they first appear at the age of 25.

The bariatric surgery procedure with the highest tendency for eating disorders is endoscopic sleeve gastroplasty, with 66.67% (2/3) tending towards eating disorders. This is contrary to a study conducted by Alqahtani et al.[22] in Arabia in 2019, which explained that patients after bariatric surgery endoscopic sleeve gastroplasty showed promising results, with the main complaint often being nausea or abdominal pain. We suspect this is influenced by the small number of respondents who underwent endoscopic sleeve gastroplasty bariatric surgery, so the results obtained do not provide precise results regarding the actual situation.

The type of bariatric surgery with the second highest tendency for eating disorders is single anastomosis duodeno-ileal bypass with sleeve gastrectomy; namely, 40% (2/5) of respondents tend to have eating disorders. The rockiest study conducted by Jaramillo et al.[23] in Colombia explained that a single anastomosis duodeno-ileal bypass with sleeve gastrectomy action was indeed considered effective in significantly reducing weight, with a weight loss percentage reaching 81%. However, this large amount of weight loss can be one of the triggers for the emergence of eating disorders in respondents who undergo single anastomosis duodeno-ileal bypass with sleeve gastrectomy procedures.

Roux-en-y gastric bypass and sleeve gastrectomy were undertaken by the majority of respondents but

had a low rate of eating disorder tendencies, namely 37.50% (6/16) and 25.00% (7/28). Research conducted by Parsons et al.[24] explains that eating disorders can arise due to malnutrition, stress, and fear of intense weight gain. Seeing that malnutrition is one of the factors that can cause eating disorders; this is in line with research conducted by Gentileschi et al.[25], Roux-en-y gastric bypass showed a prevalence of malnutrition of 36.7%, while research by Liao W et al.[26] shows that the prevalence of malnutrition after undergoing sleeve gastrectomy is 10%. The low percentage of eating disorder tendencies in these two bariatric surgery techniques is also the reason most respondents support this type of surgery.

The gastric balloon-type bariatric surgery undertaken by 2 respondents showed that none of the respondents experienced eating disorder tendencies. Research conducted by Jense et al.[27] stated that the complaints experienced after the gastric balloon procedure were nausea or vomiting and improved after 1 week. This is also in line with research by Genco et al.[28] in 2013 in New York, who compared diet management after 6 months of gastric balloon use with 6 months of gastric balloon use followed by a 1-month break and continued with gastric balloon use again for 6 months. The research stated that the eating disorder assessment showed low results. This research's weakness is that the sample target still needs to be met. Many patients have yet to reply to messages sent via WhatsApp chat, some patients are unwilling to respond, and some patients cannot be contacted. This study has recall bias because respondents must recall the situation after six months of undergoing bariatric surgery.

5. Conclusion

The prevalence of eating disorders, as assessed using the eating disorder examination questionnaire 6.0 in patients after bariatric surgery, showed that some of them tended to have eating disorders. Of the respondents who had eating disorder tendencies, all of them were female, with the largest age group being 40-49 years. In the future, post-bariatric surgery patients who tend to have eating disorders may be advised to consult a psychologist.

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