

The Nutritional Assessment for Postoperative Patients with Bariatric Surgery

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Abstract

Obesity is a global epidemic affecting populations worldwide. Bariatric surgery is currently the most effective treatment for morbid obesity. Nutrition is key in optimizing surgical outcomes by reducing risks and enhancing recovery. Therefore, the aim of this work was to evaluate the nutritional status of patients after bariatric surgery to help identify those at risk for suboptimal outcomes. A convenient sample of 29 adult male and female patients who performed bariatric surgeries was enrolled. There were 86.7% females, 73.3% married, and 71.7% performed gastric sleeve. The results indicate that there is a significant reduction ($P<0.05$) in body mass index (BMI) after 12 months after operation as compared to the Initial BMI. Patients lost an average of 24.44% after 6 months of the operation while after 12 months the patients lost 49.63% of their weight. The data shows that both waist and hip circumferences decreased, leading to a change in body shape. The significant increase in vitamin D levels post-surgery is a positive finding. There is a significant reduction in nutrient intake among bariatric patients six months after surgery compared with preoperative values. Total caloric intake and all macronutrients decreased markedly ($P<0.05$), reflecting the substantial dietary restriction and altered gastrointestinal physiology following surgery. Similarly, micronutrients such as calcium, iron, zinc, vitamin B12, and vitamin D showed significant ($P<0.05$) declines, indicating an increased risk of nutritional deficiencies. Overall, the findings confirm that the profound weight loss achieved through surgery is an effective therapeutic strategy for improving the metabolic health of individuals with severe obesity. The results suggest that patients require concurrent nutritional support to ensure optimal overall outcomes.

Key words: Bariatric Surgery – Nutrition assessment- patients – BMI – hematological parameters.

Introduction

Obesity is a recognized global disease that continues to be a risk factor for chronic medical conditions (**Mechanick et al., 2020**). Obesity negatively affects health outcomes and increases the risk of metabolic diseases (type 2 diabetes mellitus and fatty liver disease), cardiovascular diseases, osteoarthritis, Alzheimer's disease, depression and some types of cancer. In addition, obesity might lead to reduced quality of life, unemployment, lower productivity and social disadvantages (**Blüher, 2019**).

Bariatric surgery (BS) has gained popularity in the last decades for the treatment of morbid obesity and its metabolic complications. The leading types of bariatric procedures include sleeve gastrectomy, Roux-en-Y gastric bypass, one anastomosis gastric bypass, adjustable gastric banding, and biliopancreatic diversion with or without duodenal switch (**Angrisani et al., 2018**). Bariatric surgery refers to variety of surgical procedures whose primary goal is weight loss through malabsorption, restriction, or a combination of the two, depending on the type of procedure performed. Malabsorptive procedures (biliopancreatic diversion and duodenal switch) work by bypassing the intestinal lumen where most nutrient absorption occurs. Restrictive procedures (laparoscopic adjustable gastric banding, sleeve gastrectomy, and vertical banded gastroplasty) primarily limit the volume of food ingested. Roux-en-Y gastric bypass (gastrojejunostomy) achieves weight loss through a combination of malabsorption and restriction (**Parrott et al., 2020**).

However, careful patient selection is critical for its success. Thus, patients should undergo medical, behavioral, and nutritional assessment by a multidisciplinary team. From the nutritional point of view, BS candidates should undergo nutritional assessment, preparation, and education by a registered dietitian in the preoperative

period. Currently, detailed specified and comprehensive information on these topics is lacking (**Sherf-Dagan et al., 2020**).

All clinical guidelines indicate that bariatric patients should be regularly evaluated after surgery and that a long-term commitment from both the patient and the bariatric surgical team is required. The frequency of follow-up visits should be adapted to the procedures, patients' compliance and lifestyle change (**Maleckas et al., 2016**). Patients with higher BMI, and preoperative nutritional deficiency prevalences of 22–76% for vitamin D deficiency, 6–50.5% for iron deficiency, 24.2–39% for elevated parathyroid hormone, 0–56% for folate deficiency, and 15.8– 19.6% for anemia were previously described (**Williams-Kerver et al., 2019**).

Patients are required to commit to following a lifelong healthy lifestyle and behavioral modification postoperative bariatric surgery such as eating, physical activity habits and medical follow-up. In addition to close follow-up of the glycaemic control, blood lipid profile, obstructive sleep apnea, gastroesophageal reflux disease, body weight, quality of life, eating behavior and bone health (**Varban and Dimick, 2019**). Intervention should be made to help improve diet quality as needed. In cases where participants are found to be struggling to make the needed behavioral changes, more focus should be put on developing the needed coping skills (**Zickgraf et al., 2020**).

Aim of the Study: this study aims to evaluate the nutritional status of patients after bariatric surgery to identify those at risk of suboptimal outcomes, considering factors such as poor dietary habits, inadequate follow-up, noncompliance, psychological issues, and medications linked to weight gain

Subjects and Methods:

Subjects: Twenty-nine obese patients were selected from the high-volume bariatric center between February 2024 and February 2025 according to the following criteria (age ≥ 25 years old, both sexes, BMI $> 40 \text{ kg/m}^2$ with obesity-related comorbidities, postoperative patients with bariatric surgery including sleeve gastrectomy, Roux-en-Y gastric bypass or single-anastomosis gastric bypass). All participants were interviewed by the investigator through a previously scheduled semi-structured face-to-face interview and filled out the questionnaires after providing their verbal informed consent. All patients who were willing to participate in the study were included by taking a written consent.

Methods:**The data were collected by different tools:**

A. Anthropometric assessment: Body weight was measured according to **Afsana et al., (2010)**. Standing height was measured once, the reading was recorded in centimeters to the nearest 5 cm (**El-Badawy et al., 2005**). Body mass index (BMI) is calculated by taking a person's weight, in kilograms, divided by their height, in meters squared or $\text{BMI} = \text{weight (in kg)} / \text{height (m)}^2$ (**Weir and Jan, 2020**) and classified into 5 different categories, where a BMI above 30 kg/m^2 classified as obese, and a BMI above 35 kg/m^2 with significant obesity-related comorbidities or above 40 kg/m^2 is called morbid obesity (**Engin, 2017**). Waist circumference and hip circumference were measured according to the method obtained by (**WHO, 2008**).

B-Demographic characteristics of patients under study such as age, gender, level of education, marital status and occupational state were collected.

C- Nutritional assessment: measurement of micronutrients and macronutrients during 24 h recall for one week before and after bariatric surgery were analyzed by food composition tables for Egyptian foods (**National Nutrition Institute, 2006**) .

D- Patient Monitoring: The frequency of follow-up was determined by the bariatric surgery team, including the dietitian, according to the following schedule:

After Bariatric Surgery	Frequency of Postoperative Evaluations
First 6 months	Every 4 to 6 weeks
Second 6 months	Every 3 months (i.e., at 9 and 12 months)

In addition, Postoperative Nutrition Guidelines After Bariatric Surgery was provided

E- Biochemical measurement: Blood samples were collected before surgery and at three, six, and twelve months postoperatively to determine iron – hemoglobin **according to Reilly *et al.*, (1997).** Vitamin B12- vitamin D - parathyroid hormone were determined according to **Alexander and Grifiths, (1993)**

F- Statistical analysis: The data was collected, coded, and entered into a suitable Excel sheet. Data was then transferred into SPSS for Windows, version 20.0. Quantitative data were presented as mean and deviation, while qualitative data were presented as percentages. The differences observed and associations were considered as follows: Non-significant at $P > 0.05$, Significant at $P < 0.05$ (**Armitage and Berry, 1987**).

Results:

Table (1) presents the baseline characteristics of the study. The data describes a group of 29 participants (6 males and 23 females). The mean age is (36.55 ± 10.52) years indicating that the study is composed of young to middle-aged adults. According to the initial

body weight of the tested sample is (124.04 ± 23.20) kg with a range of 91 - 181 kg, demonstrating that the tested sample has a very high body weight on average. The average height (163.69 ± 10.06) cm is consistent with a general adult population, though the range is broad. The mean BMI of 46.31 falls squarely into Class III Obesity. The minimum BMI in the study (34.1) is in Class I Obesity, and the maximum (64.9) indicates extreme, severe obesity. This demographic data effectively sets the stage for a clinical investigation focused on severe obesity, highlighting a group at high risk for metabolic and cardiovascular complications.

Table (1): Demographic data

Means \ Items	Weight (kg)	Height (cm)	BMI (Kg/M²)
Minimum	91	148	34.1
Maximum	181	187	64.9
Mean$\pm$ SD	124.04 $\pm$ 23.20	163.69 $\pm$ 10.06	46.31 $\pm$ 7.73

N= (6 males and 23 females) with age (36.55 ± 10.5) year.

Table (2) provides a detailed breakdown of the types of bariatric (weight-loss) surgeries performed and the medical backgrounds of the patients in the study. The data reveals a diverse and medically complex patient population, typical of those undergoing bariatric surgery. A history of abdominal surgery increases the technical difficulty of the bariatric procedure and can influence the choice of surgical technique and port placement. This cohort represents a typical, yet complex, bariatric surgery population. The majority underwent primary laparoscopic sleeve gastrectomy, but a significant portion required more complex or revision procedures. While most patients did not have major recorded medical histories, a subset had important comorbidities like diabetes and GERD, and several had previous abdominal surgeries that added a

layer of complexity to their care. This data is crucial for understanding the baseline risks and characteristics of the study group, and it suggests that the surgical team is experienced in managing a wide spectrum of bariatric cases, from straightforward to highly complex. Sleeve gastrectomy continues to be the most common procedure. The gastric bypass procedure trend remained relatively stable (Clapp et al., 2022).

Table (2): Surgical Procedures and Medical Histories of the Patient Cohort

Items	Type	N
Operation	Bikini Lsg	1
	LSG	16
	LSG + ccc	1
	Redo Roux en Y post LSG	3
	Roux en Y bypass	2
	Sasi	6
Medical history	diabetic	1
	diabetic on cidophage	1
	H/o DVT	1
	insulin resistance	1
	No	3
	on CCP	1
	on Nexium 40 for GERD	1
	No medical history	20
Surgical history	1 cs	1
	1 cs 3 years, open appendectomy 2 y ago , ectopic pregnancy lap exploration	1
	3 CS last 10 years	1
	gastric bypass open incisional hernia and recurrent hernia cs	1
	LSG 6 years ago	1
	upper GI for GERD 5 years ago	1

N=29

Table (3) presents the anthropometric outcomes (Body Mass Index, Waist Circumference, and Hip Circumference) for patients who underwent bariatric surgery, measured at three time points. The results demonstrate a statistically significant ($P < 0.05$) improvement in all parameters over the one-year follow-up period. Pre-operation the patients started with a mean BMI of $61.31 \pm 0.68 \text{ kg/m}^2$. This falls into the category of morbid obesity, indicating a population with severe, life-threatening obesity according to (WHO, 2024). After the first 6 months the BMI decreased significantly ($P < 0.05$) to $46.32 \pm 1.43 \text{ kg/m}^2$. This represents a massive reduction. While, at the second 6 months (12 months total) BMI continued to decline significantly ($P < 0.05$) to $30.88 \pm 0.75 \text{ kg/m}^2$. This improvement is a critically important milestone, as it brings the mean BMI below the threshold of 35 and into the range of Class I Obesity (BMI 30-35). The results indicate that there is a significant reduction ($P < 0.05$) in BMI after 12 months as compared to the mean Initial BMI, patients lost an average of 24.44% after 6 months of the operation, while after 12 months the patient lost 49.63% of their weight.

The mean waist circumference was $130.39 \pm 2.63 \text{ cm}$, indicating a significant accumulation of visceral (abdominal) fat, which is strongly linked to metabolic diseases. During the first 6 months, waist circumference reduced significantly ($P < 0.05$) to $110.50 \pm 1.99 \text{ cm}$. It further decreased to $102.87 \pm 1.64 \text{ cm}$ after 12 months with significant ($P < 0.05$) differences among the different periods of the operation. A total loss of 21.10% in waist circumference was achieved. This reduction is crucial for lowering the risk of obesity-related comorbidities.

The mean hip circumference was $135.31 \pm 3.75 \text{ cm}$, after the first 6 months hip circumference reduced to $118.25 \pm 1.51 \text{ cm}$, while in the second 6 months (12 months total) hip circumference further

decreased to 109.63 ± 1.48 cm with a percent reduction reaching 18.97%

So, the bariatric surgery procedure was overwhelmingly successful in achieving significant ($P < 0.05$) weight loss, as evidenced by the dramatic reductions in all three anthropometric measurements. The progression from super-obesity to Class I obesity within one year is a transformative outcome.

The reduction of waist circumference from 130 cm to 103 cm suggests a major decrease in visceral fat, which would be expected to lead to substantial improvements in insulin sensitivity, blood lipid profiles, and blood pressure. The data shows that both waist and hip circumferences decreased, leading to a change in body shape. The consistent reduction in these measures indicates an overall loss of body fat mass (**Pouliot et al., 1994, Wang et al., 2005 and Chait and den Hartigh, 2020**) .

Bariatric surgery is one of the main treatment options for patients with morbid obesity (**Wadden et al., 2018**). **Castanha et al., (2018)** reported that most of the bariatric surgery had a BMI less than 30 kg/m^2 , which agree with the current study, as 43% of the current study participants in the post bariatric surgery group were categorized to have a BMI less than 30 kg/m^2 . The reduction in body weight may be due to reduced oral dietary intake after surgery. **Ahuja et al. (2019)**, found a significant reduction in BMI at 3 months of operation. **ElKader et al., (2024)** found a statistically significant difference in BMI among patients who performed gastric sleeve before and after the operation.

Table (3): Changes in Anthropometric Measurements Following Bariatric Surgery Over a 12-Month Period

Parameters Groups	BMI (Kg/M ²)	% of weight reduction	Waist circumference (cm)	% of waist reduction	Hip circumference (cm)	% of Hip reduction
Pre- operation	61.31±0.68 ^a	-	130.39±2.63 ^a	-	135.31±3.75 ^a	-
First 6 months	46.32±1.43 ^b	24.44	110.50±1.99 ^b	15.25	118.25±1.51 ^b	12.60
Second 6 months	30.88±0.75 ^c	49.63	102.87±1.64 ^c	21.10	109.63±1.48 ^c	18.97

*Values were expressed as Means ± SE.

* Values at the same column with different letters are significant at $P \leq 0.05$.

The changes in iron and hemoglobin levels in patients before and after bariatric surgery were recorded in Table (4). During the first 6 months post-operation, iron levels decreased significantly ($P < 0.05$) to $34.17 \pm 2.08 \mu\text{g/dL}$, while in the second 6 months iron levels showed a slight, non-significant increase to $35.72 \pm 1.73 \mu\text{g/dL}$ but remained at a similarly low level as compared to pre-operation.

On the other hand, hemoglobin decreased significantly to $11.24 \pm 0.16 \text{ g/dL}$ after, post-operation (first 6 months), moving into the anemic range for adults. At the Second 6 Months (12 Months Total): Hemoglobin decreased further to $11.02 \pm 0.14 \text{ g/dL}$. The progressive decline in hemoglobin, mirroring the drop in iron, confirms the development of iron-deficiency anemia. The body requires iron to produce hemoglobin, the oxygen-carrying molecule in red blood cells. As iron stores are depleted, hemoglobin synthesis is impaired, leading to anemia.

The drop in iron levels indicates the development of iron deficiency. This is a well-documented and expected complication after many bariatric surgeries, especially malabsorptive procedures like gastric bypass (Roux-en-Y) or sleeve gastrectomy. The causes

may be due to decreased consumption of iron-rich foods like red meat due to the small stomach capacity. The surgery alters the gut anatomy, reducing the area for iron absorption, which primarily occurs in the duodenum and proximal jejunum—areas that are bypassed or excluded (Parrott et al., 2017)

The data highlights that iron deficiency and subsequent anemia are major postoperative concerns that arise quickly (within the first 6 months) and persist if not managed aggressively. These findings underscore the critical importance of lifelong, high-dose iron supplementation and regular monitoring of iron studies after bariatric surgery (Heber et al., 2020 and Lupoli et al., 2022).

Table (4): Changes in Iron Status and Hemoglobin Levels Following Bariatric Surgery Over a 12-Month Period

Parameters Groups	Iron (µg/dL)	Hemoglobin (g/dL)
Pre- operation	43.72±2.68 ^a	12.48±0.25 ^a
First 6 months	34.17±2.08 ^b	11.24±0.16 ^b
Second 6 months	35.72±1.73 ^b	11.02±0.14 ^b

Data are expressed as Means± SE
Means with different letters in each column are significantly differs at p<0.05

The results in table (5) reveal a complex and clinically important interaction between vitamin D and PTH hormone that is crucial for bone and mineral metabolism. The mean baseline vitamin D level was 19.69 ± 2.07 ng/mL. This value falls into the Vitamin D Deficiency range (<20 ng/mL), which is extremely common in individuals with severe obesity (Perdomo et al., 2023).

After the first 6 months the operation vitamin D levels increased dramatically to 39.95 ± 2.08 ng/mL. At the second 6 months vitamin

D levels decreased slightly but remained high at 34.64 ± 1.63 ng/mL. The significant increase in vitamin D levels post-surgery is a positive finding. It is primarily due to proactive and high-dose vitamin D supplementation, which is a standard part of post-bariatric surgery care. The levels achieved are within the Sufficient range (>20 - 30 ng/mL), which is essential for calcium absorption and bone health. The slight decrease from 6 to 12 months may indicate a need for ongoing dosage adjustment.

The mean baseline PTH was 35.33 ± 1.85 pg/mL, PTH increased significantly to 48.00 ± 1.85 pg/mL after first 6 months, however, after the second 6 months (12 months total) PTH decreased slightly but remained elevated at 44.75 ± 1.72 pg/mL. The rise in PTH, despite a significant improvement in vitamin D status, indicates the development of secondary hyperparathyroidism. This is a common and concerning phenomenon after bariatric surgery (**Al-Ghimlas and Al-Ati, 2022**).

A study by **Ben-Porat et al., (2015)** analyzed nutritional deficiencies before and after sleeve gastrectomy (SG) in 77 patients over a 12-month follow-up. Prior to surgery, 99.4% of participants had vitamin D deficiencies, 40.9% had elevated parathyroid hormone (PTH) levels, and significant proportions had iron (47.1%), folate (32%), and vitamin B12 (13.1%) deficiencies. While anemia and vitamin B12 deficiencies worsened postoperatively (from 16.7% to 20%, $p < 0.001$), deficiencies in iron, folate, vitamin D, and PTH levels improved significantly. The study concluded that addressing preoperative deficiencies and tailoring supplementation programs based on routine blood tests could prevent postoperative nutritional deficits .

Bariatric surgery effectively reduces nutrient absorption in small bowels which leads to weight loss (**Funes et al., 2020**). Vitamin and

mineral deficiencies, particularly those involving vitamin D, iron, vitamin B12, and folate, are frequently observed in patients undergoing BS (De Sousa et al., 2024), these deficiencies can negatively impact surgical outcomes and overall patient health, increase the risk of complications and hinder recovery (Zarshenas et al., 2020).

Vitamin D deficiency, often attributed to insufficient dietary intake, reduced absorption, and limited sun exposure, increases risks of osteoporosis, fractures, and infections, thereby prolonging postoperative recovery (Barrea et al., 2021). Similar findings were reported in a study of 56 individuals with severe obesity (BMI > 35 kg/m²), where vitamin D deficiency correlated strongly with a higher BMI, the African-American race, and limited sunlight exposure (Stein et al., 2009). Continuous postoperative monitoring is crucial to sustain long-term success and improve patient outcomes (Gasmi et al., 2022).

Table (5): changes in Vitamin D and Parathyroid Hormone (PTH) Levels Following Bariatric Surgery Over a 12-Month Period

Parameters Groups	Vit D (ng/mL)	Parathyroid hormone (pg/mL)
Pre- operation	19.69±2.07 ^b	35.33±1.85 ^b
First 6 months	39.95±2.08 ^a	48.00±1.85 ^a
Second 6 months	34.64±1.63 ^a	44.75±1.72 ^a

*Values were expressed as Means ± SE.

* Values at the same column with different letters are significant at P≤0.05.

Table (6) compares the average nutrient intake of pediatric patients before surgery and six months after surgery. Before surgery, all nutrient intake levels (energy, carbs, fats, protein, and micronutrients)

were relatively high ($P < 0.05$) as compared to after 6 months of the operation. There was a sharp decline in intake across all nutrients. Energy and macronutrient intake decreased significantly ($P < 0.05$) after surgery, indicating restricted intake or reduced appetite—a common post-surgical effect. Micronutrient intake (Ca, Fe, Zn, Vit B12, Vit D) also significantly ($P < 0.05$) drop, suggesting possible nutritional deficiencies if supplementation or dietary adjustments are not made. The statistical significance implies these reductions are not due to random variation but are consistent and likely due to the surgery's physiological impact. Six months of post-surgery, pediatric patients experienced a marked and statistically significant reduction in the intake of all measured nutrients. This highlights the importance of nutritional monitoring, supplementation, and follow-up after pediatric surgery to prevent deficiencies and support recovery.

The findings in this study advocate nutritional intervention and tailored supplementation pre- and post-bariatric surgery for promising results (**Pooja et al., 2022**).

Preceding studies observed that energy intake 1 year after bariatric surgery was around 1000-1300 kcal/ day also, vitamin B12 deficiency resulted from gastrointestinal alterations (**Ben-Porat et al., 2015**). Current guidelines recommend a minimal target for protein intake after bariatric surgery of 60 g/day and up to 1.5 g/kg ideal body weight/day (**Busetto et al., 2018**).

There were statistically significant differences in macronutrient and micronutrient consumption of recommended dietary allowances ($P = 0.000$) among the study sample before surgery and after 1 and 3 months of surgery. There were changes in the nutritional status 1 and 3 months after bariatric surgery (**Mohammed et al., 2024**).

Table (6): nutrients intake before and after pediatric surgery

Nutrients	Pre-operation	After 6 months	t	df	Sig.
Total calories	162.0 ± 7.92	37.52 ± 2.97	14.39	5	0.000 *
Carb.	151.16 ± 8.88	22.16 ± 2.10	12.98	5	0.000 *
Proteins	89.83 ± 2.02	60.33 ± 4.22	6.18	5	0.002*
fats	216.00 ± 12.52	34.33 ± 3.76	13.49	5	0.000*
ca	86.16 ± 3.78	23.00 ± 1.41	18.68	5	0.000*
Fe	125.33 ± 10.43	12.66 ± 0.80	11.35	5	0.000*
Zn	112.66 ± 5.12	19.66 ± 2.59	24.01	5	0.000*
B12	122.83 ± 5.12	0.435 ± 0.17	24.05	5	0.000*
Vit D	24.50 ± 2.14	6.50 ± 0.22	8.78	5	0.000*

Values were expressed as Means ± SE. * Values are significant at P≤0.05.

Postoperative Nutrition Guidelines After Bariatric Surgery:

Nutritional management after bariatric surgery is a crucial component for patient recovery, prevention of nutritional deficiencies, and long-term weight maintenance. The postoperative diet is divided into progressive stages, each with specific goals and dietary recommendations.

Stage 1: Clear Liquid Phase (Days 1–7)

- Begins within 24–48 hours after surgery, once tolerated.
- Includes: water, clear broth, sugar-free gelatin, clear juice (diluted), and electrolyte solutions.
- Goal: to maintain hydration (minimum 1.5–2 liters/day).
- Avoid caffeine, carbonated, and sugary drinks.
- No solid particles or protein supplements at this stage.

Stage 2: Full Liquid / Protein Phase (Week 2–3)

- Gradual introduction of high-protein liquids such as skimmed milk, lactose-free milk, protein shakes, and yogurt drinks.
- Protein intake should reach 60–80 g/day depending on the type of surgery and tolerance.
- Liquids should be sipped slowly, avoiding the use of straws to prevent air swallowing.
- Fatty, creamy, and sugary drinks should still be avoided.

Stage 3: Pureed / Soft Diet Phase (Weeks 3–5)

- Transition to pureed or mashed foods with smooth consistency.
- Include: boiled or mashed vegetables, pureed chicken or fish, soft scrambled eggs, yogurt, and cottage cheese.
- Meals should be small and frequent (5–6 meals/day).
- Eat slowly, chew thoroughly, and stop when feeling full.
- Continue protein supplementation if dietary intake is inadequate.

Stage 4: Soft Solid Phase (Weeks 6–8)

- Introduction of soft solid foods such as minced meat, soft fruits (banana, peach), well-cooked vegetables, and tender grains (oats, soft rice).
- Avoid tough meats, raw vegetables, bread, or carbonated drinks.
- Maintain hydration and avoid drinking fluids 30 minutes before and after meals.

Stage 5: Regular Bariatric Diet (After 2–3 months)

- Gradual transition to a balanced, nutrient-dense diet focusing on:
 - Protein: 60–90 g/day (priority nutrient).

- Carbohydrates: mainly from complex sources (oats, brown rice, potatoes, fruits).
- Healthy fats: olive oil, avocado, nuts, and seeds.
- Avoid fried foods, added sugars, and refined flour.
- Encourage lifelong vitamin and mineral supplementation (multivitamins, calcium + vitamin D, iron, vitamin B12, and folate).

Continue nutrition follow-up with the bariatric team for regular assessment of weight, lab results, and dietary compliance.

Conclusion: Nutrition plays a central role in post-bariatric patients. A careful nutritional analysis should be carried out during the preoperative exams to detect possible nutritional deficiencies, and an appropriate intervention should be planned. Dietetic review for reassessment and dietary intervention in the years following bariatric surgery, along with micronutrient monitoring and supplementation, forms an integral part of ongoing nutritional care to identify, prevent and treat micronutrient deficiencies.

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التقييم الغذائي لمرضى ما بعد جراحات السمنة

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ملخص

السمنة وباء عالمي يصيب سكان العالم. تُعد جراحة السمنة حاليًا العلاج الأكثر فعالية للسمنة المفرطة. تعتبر التغذية أساساً لتحسين النتائج الجراحية من خلال تقليل المخاطر وتعزيز التعافي. لذلك، كان الهدف من هذا البحث تقييم الحالة الغذائية للمرضى بعد جراحات السمنة للمساعدة في تحديد المعرضين لخطر عدم تحقيق نتائج مثالية. خضع عدد ٢٩ مريضاً ومريضة بالغين لجراحات السمنة. كان هناك ٨٦,٧٪ من الإناث، و ٧٣,٣٪ متزوجين، و ٧١,٧٪ أجروا عملية تكميم المعدة. تشير النتائج إلى وجود انخفاض كبير ($P < 0.05$) في مؤشر كتلة الجسم بعد ١٢ شهراً من العملية مقارنة بمتوسط مؤشر كتلة الجسم الأولي، انخفاض وزن المرضى بنسبة ٢٤,٤٤٪ بعد ٦ أشهر من العملية بينما انخفض الوزن بنسبة ٤٩,٦٣٪ بعد ١٢ شهراً. تُظهر البيانات أن محيط الوسط والورك انخفض، مما أدى إلى تغيير في شكل الجسم. الزيادة الكبيرة في مستويات فيتامين د بعد الجراحة هي نتيجة إيجابية. يوجد انخفاض كبير في تناول العناصر الغذائية بين مرضى السمنة بعد ستة أشهر من الجراحة مقارنة بالقيم قبل الجراحة. انخفض إجمالي السعرات الحرارية وجميع العناصر الغذائية الكبرى بشكل ملحوظ ($P < 0.05$)، مما يعكس التقييد الغذائي الكبير وظائف الأعضاء المعوية المتغيرة بعد الجراحة. وبالمثل، أظهرت العناصر الغذائية الدقيقة مثل الكالسيوم والحديد والزنك وفيتامين ب ١٢ وفيتامين د انخفاضاً كبيراً ($P < 0.05$)، مما يشير إلى زيادة خطر الإصابة بنقص التغذية. بشكل عام، تؤكد النتائج أن فقدان الوزن الكبير الناتج عن الجراحة يُعد استراتيجية علاجية فعالة لتحسين الصحة الأيضية للأفراد الذين يعانون من السمنة المفرطة. وتؤكد النتائج أهمية الدعم الغذائي المتزامن لضمان أفضل النتائج الإجمالية.