


OBESITY AND BARIATRIC SURGERY: BIOPSYCHOSOCIAL IMPACTS

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Mariury Fonseca Cardoso¹, Joyce Fernanda Soares Albino Ghezzi² and Elza de Fátima Ribeiro Higa³

ABSTRACT

Introduction: The increasing prevalence of obesity is an emerging global problem and Bariatric Surgery continues to be the most effective intervention for obesity, with research indicating substantial weight reduction and improvements in comorbidities and psychosocial imbroglios related to this pathology. **Objective:** To understand the impacts of Bariatric Surgery using the Sleeve Technique in female patients. **Method:** Qualitative research, whose data were collected through semi-structured interviews and analyzed through the technique of content analysis in the thematic modality. **Results:** After data analysis, the research findings were listed in three categories: Benefits of Bariatric Surgery; The importance of pre-surgical preparation and post-surgical follow-up of bariatric surgery; Side Effects of Bariatric Surgery. **Conclusion:** Of the biopsychosocial impacts, the improvement of diabetes, hypertension and consequent decrease in the use of antidiabetic and antihypertensive drugs, improved self-esteem and quality of life were highlighted by the research participants. Among the negative impacts, nutritional deficiency and dumping episodes stand out.

Keywords: Bariatric Surgery, Biopsychosocial Models, Obesity, Postoperative Period, Binge Eating Disorder.

¹ Nursing Undergraduate

Faculty of Medicine of Marília - FAMEMA
Email: mariuryfonsecacardoso@gmail.com
ORCID: <https://orcid.org/0009-0003-6732-7876>
LATTES: <http://lattes.cnpq.br/0044218956558344>

² Postdoctoral Fellow in Health and Aging
Faculty of Medicine of Marília - FAMEMA
Email: joycealbinoghezzi@gmail.com
ORCID: <https://orcid.org/0000-0002-5808-613X>
LATTES: <http://lattes.cnpq.br/7584743006779247>

³ Dr. in Fundamental Nursing
Faculty of Medicine of Marília - FAMEMA
Email: hirifael@gmail.com
ORCID: <https://orcid.org/0000-0001-5772-9597>
LATTES: <http://lattes.cnpq.br/7363324618190102>

INTRODUCTION

In recent decades, it can be observed that the process of epidemiological transition has been changing in the face of population aging. Life expectancy increased by about 30 years or more depending on the sociodemographic conditions of the individuals. However, even in the face of this phenomenon, it is worth noting that the global burden of diseases has also undergone changes as a result of lifestyle changes, thus making Chronic Non-Communicable Diseases (NCDs) more prevalent worldwide ⁽¹⁾.

Diseases such as cardiovascular, diabetes, cancer, and chronic respiratory diseases are examples of NCDs responsible for premature deaths and functional disability, killing about 15 million people a year, especially in underdeveloped countries. Smoking, alcoholism, sedentary lifestyle and dietary risks comprise the main risk factors related to NCDs; Overweight and obesity are also considered risk factors, being classified as metabolic risks, as well as hypertension, hyperglycemia and hyperlipidemia ^(2,3).

A study carried out in an Asian country revealed that among the metabolic risk factors, obesity was the most prevalent factor, affecting 83.5% of a total of 1942 participants; then, overweight was present in 42.6% of the sample. Hypertension and hyperglycemia were also evaluated, representing 12.8% and 19.2%, respectively. However, the disparity between obesity and overweight is highlighted in relation to other metabolic risk factors⁽⁴⁾.

Overweight and obesity imply the accumulation of body fat that exceeds the established anthropometric norms to varying degrees and may be due to the interaction of nutritional elements, genetic susceptibility or sedentary lifestyle. In addition, socioeconomic factors, such as working and housing conditions, can be included in the causal structures of this issue⁽⁵⁾.

The increasing prevalence of overweight and obesity is an emerging global problem. In Brazil, the proportion of individuals identified as obese in the 20-year-old age group experienced an increase from 12.2% to 26.8% between 2003 and 2019. During the specified period, there was an increase in the prevalence of obesity among women from 14.5% to 30.2%, while the corresponding number for men increased from 9.6% to 22.8%, thus considering that women stand out in terms of obesity when compared to the male gender^(6,7). A study carried out in Africa corroborates these findings, since among the investigated population (1,100 participants), women stood out with a high proportion of overweight and obesity, being 62.9% versus 23.4% compared to the male public ⁽⁸⁾.

The negative effects of obesity extend to mental health, triggering or exacerbating psychological disorders such as depression, anxiety, reduced self-esteem, and specific dietary irregularities ⁽⁹⁾. And, when thinking about treatment for obesity, Bariatric Surgery continues to be the most effective intervention, with research indicating substantial weight reduction and improvements or even resolution of comorbidities related to this pathology ⁽¹⁰⁾.

The scope of Bariatric Surgery goes beyond its physical repercussions, encompassing biopsychosocial dimensions, as changes in body morphology can provoke feelings of acceptance and trust⁽¹¹⁾. On the other hand, postoperative complications may manifest, presenting problems such as hair loss, anemia, nausea and frequent vomiting, among other unwanted effects ⁽¹²⁾.

However, it should be noted that Brazil is the leading country in the execution of this procedure. According to estimates by the Brazilian Society of Bariatric Surgery, there are about 60,000 bariatric surgeries per year in the country. Data reveal that, from 2009 to 2019, the Unified Health System in Brazil financed a total of 83,829 bariatric surgeries aimed at the treatment of obesity. The analysis of the target audience of this research revealed a higher prevalence of body dissatisfaction among women compared to men, thus elucidating the disparity in surgical interventions between the two sexes: 85% vis-à-vis 15% ⁽¹⁰⁾.

Thus, considering the significant increase in NCDs as well as its consequences in terms of morbidity and mortality, in addition to the strong influence that obesity promotes as a risk factor for NCDs and the bariatric procedure as a powerful intervention against obesity, this research had the following question: what are the biopsychosocial impacts presented in obese patients undergoing bariatric surgery? Therefore, the objective was to understand the impacts of Bariatric Surgery using the Sleeve technique in female patients.

METHOD

This is a qualitative field research, considering the object of the study.

The research took place in a small municipality in the interior of São Paulo, which develops a municipal project called *Healthy Weight*. This project is developed by the Department of Hygiene and Health and the Sports Division of the city hall and aims to offer follow-up with a multidisciplinary team made up of a gastroenterologist, psychologists, nutritionist, educators and massage therapist for overweight and obese patients in order to

lose weight. The meetings are free, weekly and to participate it is necessary to look for the Family Health Unit of reference. In recent years, the *Healthy Weight program* has already referred more than 80 bariatric surgeries.

Individuals, regardless of gender and age, who underwent bariatric surgery and who were part of the Healthy Weight program were invited to participate in the research. Data were collected through semi-structured interviews and recorded by audio recording. The interviews were conducted in places that ensured the privacy and anonymity of the participants, according to their availability. They were then transcribed in full and erased from the recorder, omitting any information that could identify the interviewee.

The interviews were collected by one of the researchers in this study, who performed an elective internship at the collection site. This researcher was properly trained in the non-directive technique. At the time of the interview, only the researcher and the participant were present; Each interview lasted an average of 10 minutes. There was no need to repeat interviews. The script used for data collection was validated by two external judges; In addition, a pilot interview was conducted prior to data collection.

The research sample was defined through data saturation. The data were analyzed according to the methodological framework of content analysis in the thematic modality⁽¹³⁾.

This research project was submitted to the Research Ethics Committee for validation, in accordance with Resolution No. 510/2016, and was approved under Resolution No. 6,497,953. All participants who agreed to participate in the research received the information pertinent to it through the Informed Consent Form. Each participant is identified with the letter P (participant) followed by the interview number, which is described as follows: P1 Participant number 1.

RESULTS

Ten people participated in the research, according to the data saturation technique. The participants were on average 47 years old, female and "married" marital status, being 60% of the sample; in the professional category, the health area was present in 50% of the sample; In terms of schooling, high school was mostly present, accounting for 60% of the total sample. Table 1 presents the sociodemographic details of the research participants.

Table 1 – Sociodemographic characteristics of the participating population, Marília, 2024.

	Total	Percentage Representation
GENDER		
Female	10	100%
Male	0	0%
AGE		
30 to 39 years old	3	30%
40 to 49 years old	4	40%
50 to 59 years old	3	30%
MARITAL STATUS		
Married	6	60%
Single	1	10%
Widower	0	
Kneaded	1	10%
Divorced	2	20%
SCHOOLING		
Complete High School	7	70%
Complete Higher Education	3	30%
PROFESSION		
Health Area	5	50%
Secretary	1	10%
School Monitor	1	10%
From home	2	20%
Retired	1	10%

Source: authors, 2024.

Regarding the surgical procedure, the research participants were asked about the surgical technique adopted, and the sample was 100% submitted to the *Sleeve technique*. The participants' post-surgical time comprised a minimum period of 2 months and a maximum of 12 years, with 70% of the sample within the period of 13 to 60 months. Weight loss among the participants was an average of 34.7 kilos, with a minimum of 13 and a maximum of 84 kilos. Table 2 presents details about the surgical information.

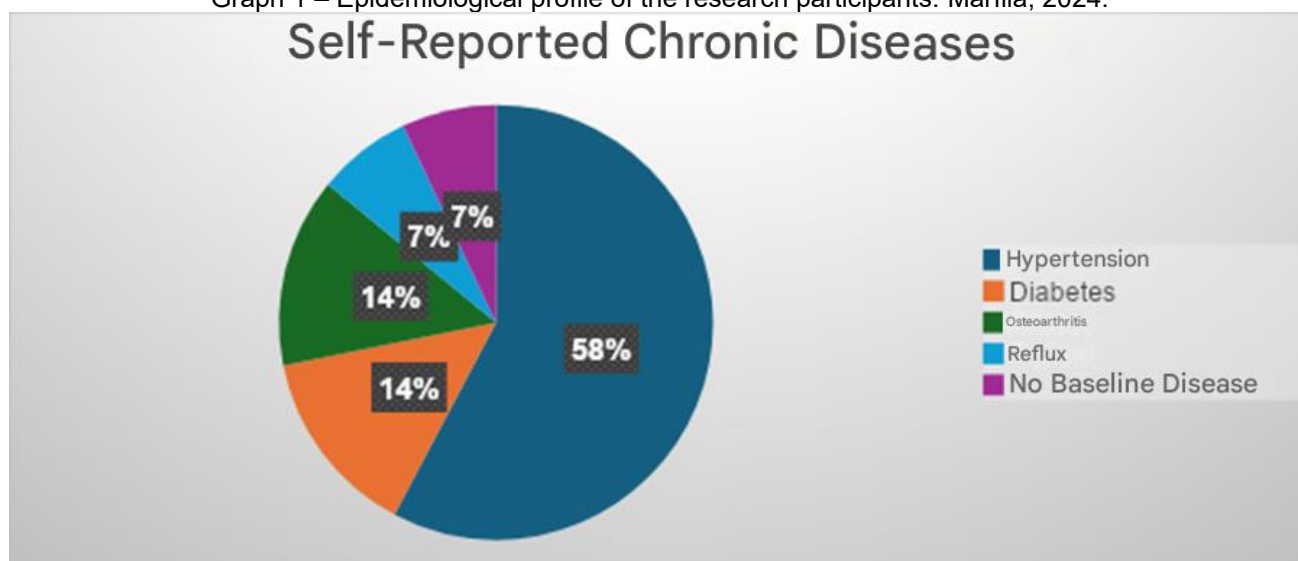
Table 2 - Surgical information on the bariatric procedure, according to the technique performed, the postoperative time and weight loss after the procedure. Marília, 2024.

	Total	Percentage Representation
SURGICAL TECHNIQUE		
Sleeve	10	100%
Bypass/Gastroplastia em Y de Roux	0	
POSTOPERATIVE TIME		
< 12 meses	2	20%
13 to 60 months	7	70%
> 120 meses	1	10%
WEIGHT LOSS		
10 to 20 kilos	1	10%
20 to 30 kilos	3	30%
30 to 40 kilos	4	40%
40 to 50 kilos	1	10%
Above 50 kilos	1	10%

Source: authors, 2024.

Taking into account that obesity is a potent factor in the criterion for bariatric surgery, in addition to the imminent risk of developing chronic diseases, the research participants were asked about underlying diseases that pre-existed the procedure. Among the chronic diseases, 58% of the sample self-reported being hypertensive. Only one participant verbalized not having any pre-existing underlying disease. Graph 1 presents more details on the epidemiological profile of the population studied.

Graph 1 – Epidemiological profile of the research participants. Marília, 2024.



Source: authors, 2024

After data analysis, the research findings were listed in three categories: Benefits of Bariatric Surgery; The importance of pre-surgical preparation and post-surgical follow-up of bariatric surgery; Side Effects of Bariatric Surgery. The following table presents the analytical categories mentioned above with their respective decoded subcategories.

Chart 1 – Thematic categories with their respective decoded subcategories. Marília, 2024.

	ANALYTICAL CATEGORY	SUBCATEGORY
1	Benefits of Bariatric Surgery	Motivation for the procedure
		Promotion of self-esteem
		Health promotion
2	The importance of pre-surgical preparation and post-surgical follow-up of bariatric	Multiprofessional follow-up
		Vitamin supplementation
3	Side Effects of Bariatric Surgery	Side effects from the surgical procedure
		Dumping

Source: authors, 2024.

The category that portrays the benefits of Bariatric Surgery brought perspectives regarding the motivation to perform the procedure. We can observe in the participants' statements that the driving factors for performing the surgery range from health care, quality of life, in addition to the desire to lose weight.

"I had surgery for health reasons, because I had altered blood glucose, diabetes [...]" P3

"The pains. I had a lot of pain and I went to the orthopedist and it was not possible to go to the gym, these things [...]" P2

"Quality of life with my daughters. I couldn't. We went once to the zoo, me, my husband and them. I couldn't walk with them without sitting down all the time to rest because I couldn't keep up with them [...]" Then I said no, I need to have a quality of life to enjoy with my family. And that's when I joined the project to be able to have the surgery" P6

"I felt like it, because I tried several diets and had difficulty losing weight [...]" P10

Still in the process of the benefits of bariatric surgery, the participants verbalized about the promotion of self-esteem resulting from the surgical procedure. Among some benefits, the participants highlighted the possibility of buying clothes and feeling comfortable.

"Go to a store to buy a new dress, you go to one and it doesn't fit. It's boring, right? And we get a little upset; oh! I do feel, I feel good, now when I wear a dress I feel good." P1

"[...] When we're chubby, nothing looks good, right? Nothing fits, nothing looks good, the clothes are ugly, there are no nice clothes for chubby, they are more expensive. After you lose weight it's another situation [...]" P2

The participants also talked about the self-esteem recovered by personal satisfaction, especially in view of the possibilities of performing some activities that they felt uncomfortable with before the surgical procedure.

"[...] In the past I deprived myself of some things, just like that, I didn't want to take pictures anymore [...]" P4

I didn't have a mirror in my house, I hated places with mirrors, I only had a mirror in the bathroom that was for combing my hair and putting on makeup. Not today, in front of my room with a large P3 mirror

"[...] Things I didn't do before, I felt limited. I was ashamed to go eat at a snack bar, because like that I imagined that people were looking at me and saying "Wow, how she eats a lot" you know? [...]" P7

"[...] Then we go for a walk but there will be no place for me to sit, I won't be able to walk. Then I'm going to sit in a chair. The chair will end, you know? There was all this [...]" P6

It was possible to identify in the participants' statements the benefits of bariatric surgery in their own health, such as improvements in chronic diseases, symptoms such as malaise, tiredness and shortness of breath. In some situations, these improvements have even reflected in the quality of life with the family.

"[...] With weight loss I am more agile, I am managing to do the hydro exercises better [...]" P9

Wow, it improved a lot, because I already had fat in my liver. It has improved 100%. Hypertension has improved, now I don't take medicine anymore [...]" P10

"[...] I was taking seven types of diabetes medications, it wasn't seven pills a day, it was seven types of medications, that lot of medication that is part of my past, thank God [...]" P3

"[...] breathing, tiredness, sleeping, much better, even our psychology seems to improve [...]" P8

"[...] we went to Eco Park, I was able to play with my daughters, I was able to enjoy it, my daughter even said to me "Wow, what a wonderful day! You managed to play with us" [...]" P6

"[...] Today I come home from my job and I have a great disposition, I already have lunch and go to another job, right? So I have a very dynamic routine. And then I have well-regulated sleep, which has always been after surgery [...]" P5

The second category of outcome analysis is linked to the importance of pre-surgical preparation and post-surgical follow-up of bariatric surgery. In this sense, the work of the multidisciplinary team was very present in the participants' statements, especially the medical, psychological and nutritional follow-up in the pre-surgical period. It can be seen that some patients have reported weight loss even before undergoing bariatric surgery.

Yes, I did it with a psychologist and a nutritionist. I even lost 14 kilos to have the surgery. P1

In the follow-up [...] I lost ten kilos before the surgery [...] P6

In addition, the participants verbalized the importance of this multidisciplinary follow-up to better understand issues related to anxiety and food control.

[...] It's not eating because I was hungry, but eating because I felt like it, so I wanted to work harder, I wanted to convince myself that we have to eat when we're hungry. Sometimes I'm at home and I say "oh I'm going to eat something", then I stop and think why I'm going to eat if I'm not hungry. So that was what I wanted to work on the most with the psychologist. P3

Very important, very much [...] both bariatric and lipo, like any procedure, it's not forever, you're not going to do it, and stay thin for the rest of your life, so you have to control it here [...] So, I think it was very important that it was this psychological treatment, because I needed to lose weight, so I needed to get in the right line to continue this for life [...] P4

The participants also pointed out the use of multivitamin supplementation after the bariatric procedure, among the statements it can be seen that in all cases the use of supplements was indicated by the medical team. At the time of the interview, some participants still used supplementation, others no longer and in one of the interviews, the non-acceptance of multivitamin supplements was raised.

[...] I take a vitamin supplement. P9

[...] The supplement is up to three months and the multivitamin is up to one year, so today I don't take it anymore. P8

I even tried, but my stomach didn't accept it, you know? I took it and came back. Then I talked to the doctor, he said that it was better for me to stop trying and get sick, right? Because then I would eliminate more vitamins. Then I didn't take it. Then now I take Whey protein only. P1

The category that presents the side effects of Bariatric Surgery includes the participants' statements about the negative perspective after bariatric surgery. Therefore, hair loss and weakened nails were present.

[...]After the surgery I realized that it fell a lot, but now I even think it has strengthened. So, I thought it improved. But in the beginning you passed, there was a lot. P4

I had a lot of hair loss[...] And to this day I have to police myself, take vitamins. The nails are weak, a little weak. P5

I had a lot in the beginning, then I cut it, now it has decreased. The weak nail is still there. P6

[...] My hair is falling out very, very, very [...] P8

I had it, I still have it but it's not much, the nails also became weak. P10

Still on the negative effects, it was possible to identify in the interviews statements about the presence of *dumping* after bariatric surgery.

Then I had, until today, if I take something fast, eat very fast, I have dumping [...] A pain here... it seems like the heart that hurts, I can't explain it properly [...] P1

I had it and it was horrible. It was after eating. We went out to dinner and then we ordered a portion, right? There was meat and then I went to eat red meat. Then I felt very sick. Then it started to give me chills, then my heart I said people I think I'm going to die, then I lay down, but then it seems to get worse. Right? It was the first time I had it there after that. So it was the chill, yours, my stomach hurts. You don't know if you vomit, if you lie down. P6

I still have a little bit, because in fact I have a hiatal hernia, so I eat sometimes I feel a little burning, a malaise, at first I had the feeling that I was going to faint, sometimes I still feel when I eat something heavier, with more fat, it's a bad feeling we don't know if it hurts, if you burn, if you will faint. My hair is falling out very, very, very. I wanted to see if he gives me a vitamin, if he will need tests. P8

DISCUSSION

This field research, which included 10 participants, aimed to identify the biopsychosocial impacts after bariatric surgery. Extreme obesity is related to a psychosocial burden, encompassing impairments in quality of life, body image, and various psychosocial aspects. It is believed that this suffering, together with the physical burden of obesity and its comorbidities, plays a role in the choice to undergo bariatric surgery⁽¹⁴⁾. In this research, the main motivation for performing the procedure reported by the participants was linked to the search for a better quality of life and health care. In a previous study, it was revealed that after the bariatric procedure, most patients were satisfied⁽¹⁵⁾, and the present study showed high satisfaction on the part of the participants in the postoperative period.

Regarding the positive biological impacts, in addition to promoting weight reduction, Bariatric Surgery exerts a significant influence on chronic conditions, such as hypertension. One study revealed a notable decline in the use of antihypertensive medications after surgery. In addition, 75% of the individuals encountered a regression of hypertension after

the procedure. Factors that contribute to the improvement of Systemic Arterial Hypertension (SAH) include weight decrease, reduced levels of inflammatory agents, and decreased activity of the renin-angiotensin-aldosterone system. Consequently, due to weight loss, Bariatric Surgery notably decreases the need for antihypertensive medications ⁽¹⁶⁾

Bariatric surgery also produces favorable results for type 2 diabetes mellitus (DM II), concomitantly with a reduction in the consumption of antidiabetic agents, as indicated by the results of a previous study. According to the investigation involving 66 participants who underwent bariatric surgery, initially, 36% of the individuals suffered from DM II, which decreased to 14% after a period of 5 years after the bariatric procedure⁽¹⁷⁾.

Similar to the findings in the literature, this study also indicated a significant improvement in SAH and DM II in the postoperative period of bariatric surgery, as well as a decrease in the use of antihypertensive and antidiabetic drugs. In addition, greater disposition, agility and improvement in sleep quality were also verbalized by the participants of this study.

The significant loss in weight after the surgical procedure also results in improvements in psychological well-being in several aspects, indicating a general trend towards a decrease in depression levels, improved quality of life and higher levels of satisfaction with body image after bariatric surgery⁽¹⁸⁾. Consistent with the literature, after weight loss, it was reported by the research participants, improved self-esteem and greater freedom to experience moments of leisure and self-care.

Obese individuals generally have high levels of body dissatisfaction and tendencies to negative self-criticism. Obesity can generate substantial suffering and significant challenges in the social and professional domains⁽¹⁹⁾. Thus, individuals who seek Bariatric Surgery as a potential solution to face health problems also find a solution to the aesthetic and interpersonal challenges encountered in their daily lives, thus being a transformative option⁽²⁰⁾. Related to this theme, the patients interviewed in the current study reported significant improvements in personal and social aspects, such as greater ease in buying clothes, going on outings and trips, and greater interaction on social networks through *selfies*.

Despite the beneficial impacts already presented, Bariatric Surgery can have negative biological consequences. Taking into account the homeostatic balance of the human body, some studies have highlighted crucial points about the possible nutritional

changes of bariatric surgery. After this surgical intervention, individuals may face challenges in the absorption of essential vitamins found in food⁽²¹⁻²⁷⁾.

Consequently, patients after the bariatric procedure usually manifest symptoms such as fatigue, alopecia, muscle spasms and paresthesia attributable to the decrease in the levels of iron, vitamin D, phosphate and vitamin B12 in their physiological system^(27,28). Considering the nutritional deficit and its consequences presented in the literature, the present study revealed that the vast majority of participants used multivitamin supplementation with a medical prescription after the bariatric procedure. In addition, hair loss and weak nails were widely reported.

Dumping syndrome, identified as a feeling of dizziness and discomfort accompanied by abdominal discomfort subsequent to sugar consumption in individuals undergoing bariatric surgery, can be categorized as early or late, due to the interaction between the secretion of gastrointestinal hormones and the rapid influx of fluids into the intestinal cavity⁽²¹⁾.

When correlating dumping syndrome with the surgical technique, 100% of the sample in the present study was submitted to the *Sleeve* technique and 40% reported having already presented *dumping* syndrome after the bariatric procedure right after meals, with symptoms such as abdominal pain, chills, feeling of fainting, dizziness and darkened eyes. A study conducted to evaluate the frequency of *dumping symptoms* after laparoscopic sleeve gastrectomy (LSG) compared to *gastric bypass*, demonstrates a prevalence of *dumping syndrome* reaching 26.5% after LSG. This occurrence can be explained by the rapid gastric emptying, changes in physiological and anatomical aspects, such as increased intragastric pressure due to the absence of receptive relaxation, in addition to the rapid gastric emptying resulting from the excision of the gastric fundus⁽²⁸⁾.

It is worth mentioning that the results of bariatric surgery can be related not only to the surgical procedure, but also to the type of pre- and post-surgical follow-up that patients undergo. The emphasis on preoperative psychosocial well-being is a contributing factor to the standard clinical protocol in the United States, which requires individuals interested in Bariatric Surgery to first undergo a mental health evaluation. This assessment aims to identify potential psychiatric and behavioral constraints to surgery (such as psychosis, severe, untreated depression, active substance abuse, or significant non-compliance with behavioral guidelines), as well as to provide patients with information about dietary and behavioral obstacles after surgery⁽¹⁴⁾.

The participants of this research were also submitted to pre and post-surgical follow-up, with several health professionals, including nutritionists and psychologists, according to the organization of the *Healthy Weight program*. As reported by the sample participants, multidisciplinary follow-up before surgery was extremely important to work on feelings of stress and anxiety that resulted in greater food consumption, promoting dietary re-education, better adaptation in the postoperative period and better post-bariatric results.

FINAL CONSIDERATIONS

In view of the objective of this study, it was possible to verify that the impacts highlighted were both beneficial and harmful. Several studies have revealed significant improvements in patients' conditions, including better control of diabetes and hypertension, leading to reduced dependence on anti-diabetic and antihypertensive medications. In addition, weight reduction after the surgical procedure contributes to the improvement of patients' self-esteem and overall quality of life. However, some observations were made about nutritional deficit and *dumping syndrome* after bariatric surgery. In addition, it was pointed out about the multidisciplinary follow-up in the pre and post surgery and what are its positive results after the procedure.

From this perspective, despite the scientific progress resulting from this field research, the need for research in this area remains pertinent. In addition, emphasizing the data on nutritional deficiencies observed in patients who underwent bariatric surgery, it is of great relevance that future research should carry out a more in-depth investigation on the efficacy of multivitamin supplementation in the postoperative period.

Thus, the results of this study allowed comparisons with the literature and it can be seen that its findings were in line with previous studies that were used in the discussion. In addition, even though the sample was not so large, due to the fact that the research was carried out in a single place with a specific group, it reached saturation in the answers obtained from the interviews, so that the addition of information would not alter the understanding of the subject studied.

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