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Nutritional profile and quality of life assessment after bariatric surgery in a public hospital in Goiania, Brazil

Avaliação do perfil nutricional e qualidade de vida após realização de cirurgia bariátrica em um Hospital Público de Goiânia, Brasil

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Abstract

Objective: to evaluate the nutritional profile and quality of life of individuals undergoing bariatric surgery in a public hospital of Goiânia-GO, Brazil. *Methodology*: cross-sectional study conducted between August and November 2016, with 56 patients at the 6, 12 and 18-month postoperative period of Roux-en-Y Gastric Bypass. Anthropometric profile, presence of comorbidities, life habits and quality of life were analyzed through the BAROS instrument. *Results*: 84% were female, with a mean age of 46 years (SD = 9.61), mostly wuth incomplete primary school level (44%). In the preoperative period the mean BMI was 50.1 kg / m^2 ± 8.37 and the weight loss was 8.7%. After bariatric surgery, the mean BMI was 35.7 kg / m^2 ± 7.09. The loss of excess weight was greater than 50% in 78% of the sample. High resolution indexex of sleep disorders (94%), dyslipidemias (91%) and diabetes (86%) ($p < 0.001$). Alcohol consumption was found in 3.7% of the individuals and 74% reported practicing physical activity. Quality of life was assessed as improved (27%) and greatly improved (73%). There were no significant differences between the three postoperative periods and between the individuals who had a weight loss of less than 50% and over 50%, although all reported improvement in the domains evaluated. *Conclusions*: Bariatric surgery was effective in in aiding weight loss, improving comorbidities and quality of life in obese individuals.

Keywords: Bariatric Surgery. Obesity. Quality of Life.

Resumo

Objetivo: avaliar o perfil nutricional e qualidade de vida de indivíduos submetidos a cirurgia bariátrica em um hospital público de Goiânia. *Metodologia*: Estudo transversal, realizado entre agosto a novembro de 2016, com 56 pacientes do ambulatório de obesidade com 6, 12 e 18 meses de pós-operatório de *bypass* gástrico em Y de Roux. Analisaram-se perfil antropométrico, presença de comorbidades, hábitos de vida e qualidade de vida por meio do instrumento BAROS. *Resultados*: 84% do sexo feminino, com média de idade de 46 anos (DP= 9,61) e nível de escolaridade predominante ensino fundamental incompleto (44%). No período pré-operatório, a média de IMC foi 50,1 kg/m² ±8,37 e a de perda de peso, 8,7%. Após a cirurgia bariátrica, a média do IMC foi 35,7 kg/m² ±7,09. A perda de excesso de peso foi superior a 50% em 78% da amostra, e houve altos índices de resolução de distúrbios do sono (94%), dislipidemias (91%) e diabetes (86%) (p<001). O consumo de bebida alcóolica foi encontrado em 3,7% dos indivíduos e 74% referiram praticar atividade física. A qualidade de vida foi avaliada como melhorada (27%) e muito melhorada (73%). Entre os três períodos pós-operatórios e entre os indivíduos que tiveram perda ponderal inferior e superior a 50%, não se constataram diferenças significativas, embora todos tenham relatado melhora nos domínios avaliados. *Conclusões*: a cirurgia bariátrica tem demonstrado eficácia no auxílio na perda de peso, melhora das comorbidades e da qualidade de vida de indivíduos obesos.

Palavras-chave: Cirurgia Bariátrica. Obesidade. Qualidade de Vida.

Introduction

Obesity is a chronic disease characterized by excessive accumulation of fats in the body, impairing the individual's health and quality of life and increasing the risk of mortality and incidence of other noncommunicable diseases (NCD). Of multiple etiology, obesity can be associated with genetic, sociocultural, environmental and/or behavioral factors, and today it affects 52.2% of the Brazilian population.[1-4]

According to the World Health Organization (WHO), the body mass index (BMI) is an indicator used to classify individuals according to their weight and height. It is also valid to stratify overweight and obesity levels, so that BMI values > 30 and < 35 kg/m² are considered as Grade 1 Obesity; > 35 and < 40 kg/m² as Grade 2 Obesity; and > 40 kg/m2 as Grade 3 Obesity or severe Obesity.[5]

Treatment of obesity consists of pharmacological, dietary interventions, as well as changes in living habits (encouragement of physical activity) and cognitive-behavioral therapy. When there is strong reluctance to adhere to conservative treatments after regular follow-up for at least two years, bariatric surgery may be indicated for certain clinical conditions.[2,3] The most common technique is the Roux-en-Y gastric bypass (Fobi-Capella), considered a restrictive and disabsorptive mixed surgery that can provide 30-40% of total weight loss.[6]

Sustained weight loss is one of the aims of bariatric surgery, because it is expected that obesity-related comorbidities will improve or start remission, quality of life will improve and morbimortality will diminish.[7]

The concept of quality of life, in turn, has different approaches and may be understood as an ideal condition of health and lifestyle, the personal perception of one's position in life and the system of values in which one lives, among others.[8] Unhealthy living aspects such as alcoholism, smoking[9] and lack of physical exercises may be associated with obesity and, therefore, with the individual perception of quality of life. Studies have indicated associations between high BMI and lower work ability, when related to physical work requirements in sedentary individuals.[10]

Oria and Moorehead[11] developed a protocol to assess the efficiency and impact of bariatric surgery on the quality of life of obese patients, named Bariatric Analysis and Reporting Outcome System (BAROS). This instrument assesses excess weight loss, improvement of comorbidities and five aspects relating to quality of life, among them: self-esteem, physical activity, social life, performance at work, and sexual activity.[12,13]

In this regard, taking into account that the bariatric surgery is considered an effective treatment to control weight, in positive prognosis of associated comorbidities and also in the quality of life of obese patients, the present study aimed to assess the nutritional profile and quality of life of individuals that underwent bariatric surgery in a public hospital in Goiânia-GO, characterizing the anthropometric profile, living habits in the postoperative period and changes in the perception of quality of life.

Methodology

This was a quantitative, cross-sectional study, and data was collected from August to November 2016, consisting of anthropometric profiles, presence of morbidities, living habits (alcoholism, smoking, physical activity) and quality of life of adults who underwent bariatric surgery at a public hospital in Goiânia-GO. All participants signed the Free Informed Consent Form (FICF).

The sample size calculation was based on the total number of surgeries performed from January 2015 to April 2016 (n=77). A 95% confidence interval and 10% margin of error were considered, totaling 20 participants.

The sample consisted of individuals enrolled in the obesity and bariatric surgery program of the institution. As a condition to participate in the survey, all applicants should have undergone Roux-en-Y gastric bypass (Fobi-Capella) from February 2015 to May 2016. The participants were classified into three groups, according to the postoperative period at the day of data collection: (a) Group 1: comprising patients with six months in the post-op period (surgery conducted between February to May 2016); (b) Group 2: individuals with 12 months in the post-op period (August to November 2015); and (c) Group 3: patients with 18 months in the post-op period (February to May 2015).

The sample included individuals of both sexes, aged 18 to 65 years; BMI>35kg/m2 associated with comorbidities such as type II diabetes *mellitus*, sleep disorders, high blood pressure, dyslipidemia, lower back pain, osteoarthrosis, among others;[14] with BMI>40kg/m2; who had undergone Roux-en-Y gastric bypass (Fobi-Capella technique) at least six months before the data collection period; minimum educational level corresponding to incomplete primary school; who agreed to sign the FICF (Appendix A).

Individuals aged less than 18 and over 65 years, with BMI<35kg/m2 (with or without associated comorbidities), in late postoperative period (19 months or over), who had other surgical technique, except Roux-en-Y gastric bypass, and did not agree to sign the FICF or did not attend the previously scheduled appointment, were not included in the survey.

Data collection was made upon an anthropometric evaluation and administration of a printed questionnaire, available on Appendix A. The outpatients were invited to participate in the survey at the date of the postoperative appointment at the nutrition care unit, as indicated in the unit's protocol for bariatric surgery, and the evaluations were performed while the individuals were waiting for the consultation. The questionnaires were administered in two ways: the first part through a semi-structured interview, completed by the researcher, and a second part consisting of an assessment of the quality of life, as proposed by the BAROS instrument, according to Annex A, which was completed by the patients.

The questionnaire was built based on a literature review, aiming to include the following information: a) sociodemographic data (sex, age, educational level); b) morbidities before and after the surgery; c) anthropometric data[11] relating to the pre-op period (pre-op weight, maximum weight reached in lifetime, pre-op BMI, ideal weight, excess weight, percentage of pre-op weight loss; d) anthropometric data relating to the post-op period, such as current weight, minimum weight, post-op BMI, percentage of excess weight loss; e) living habits in pre-op and post-op periods,

including drinking, smoking and physical activity (Appendix B). To measure the quality of life, the Bariatric Analysis and Reporting Outcome System(BAROS) instrument[11] was partially used, adapted from the original to the Portuguese language (Annex A).

The comorbidities were reported by the patient when the questionnaires were administered, without further consultation on medical records or tests analysis.

With respect to the anthropometrics, the pre-op weight was taken from the patient!s records; the maximum body weight attained in lifetime was reported by the patient himself during the interview; current post-op weight was measured with a digital scale (Líder®, 300kg capacity and 100 g precision), and body height was measured with a stadiometer coupled to the digital balance, having maximum length of 2 meters and scale of 0.5 cm. During measurement, the individual was barefoot, with minimum clothing, standing in upright position, arms relaxed along the body, heels joined and looking straight to the horizon. The other data (pre-op BMI, ideal weight, excess weight, percentage of pre-op weight loss, post-op BMI, percentage of weight loss) were calculated.

The percentage of pre-op weight loss was calculated by the maximum weight attained minus the pre-op weight, divided by the maximum weight, and multiplied by one hundred. As ideal weight, the BMI mean value of 24.9kg/m2 was considered, because it is the threshold value between normal weight and overweight.[5] The excess body weight was calculated in kilograms by subtracting the ideal weight from the pre-op weight. The percentage of excess weight loss (%EWL) was calculated by the weight-loss-to-excess-weight ratio.

The sociodemographic and anthropometric data were investigated by means of descriptive analyses such as absolute frequency, percentage and standard deviation. To evaluate categorical variables, the paired Student's t-test was carried out; the non-parametric Wilcoxon Mann-Whitney's test for independent samples; and the non-parametric Kruskal Wallis's test to compare three independent samples.

To assess the questions of the BAROS instrument, only the part on quality of life was used, where each question has a categorical Likert scale for the options. The "self-esteem" question totalized up to 1 (one) point (Much worse about myself = -1; Worse about myself = -0.5; The same about myself = 0; Better about myself = +0.5; Much better about myself = +1). The other questions, physical activity, social relationship, performance at work and sexual interest could totalize up to 0.5 point for each question (Much less = -0.5; Less = - 0.25; The same = 0; More = +0.25; Much more = +0.5).

The final assessment of quality of life resulted in a number between -3 (minus three) and +3 (plus three). So, quality of life was scored as greatly diminished (-3 to -2.25), diminished (-2 a -0.75), unchanged (-0.5 to 0.5), improved (0.75 to 2) or greatly improved (2.25 to 3).[7]

Significance level was set as 5% ($p < 0.05$), and the data were analyzed using the SPSS (Statistical Package for The Social Sciences) software, version 16.0.

The research was approved by the Ethics Committee for Human Research of the *Hospital Geral de Goiânia* (Goiania General Hospital) (CAAE 56567116.9.0000.0035).

APPENDIX A – QUESTIONNAIRE FOR DATA COLLECTION

Hospital Geral Goiânia (Goiânia General Hospital)
Work: Assessment of the nutritional profile and quality of life after bariatric surgery

1. IDENTIFICATION

Sexo: ☐ female ☐ male	Birth date: ____/____/_____

Educational level:

☐ Incomplete primary school ☐ Complete primary school

☐ Incomplete secondary school ☐ Complete secondary school

☐ Incomplete college education ☐ Complete college education

2. ASSOCIATED DISEASES

BEFORE SURGERY	AFTER SURGERY
☐ High blood pressure	☐ High blood pressure
☐ Diabetes	☐ Diabetes
☐ Dyslipidemia	☐ Dyslipidemia
(Ex: high cholesterol, high triglycerides)	(Ex: high cholesterol, high triglycerides)
☐ Osteoarthritis	☐ Osteoarthritis
☐ Osteoarthrosis	☐ Osteoarthrosis
☐ Lower back pain; back pain	☐ Lower back pain; back pain
☐ Sleep disorders	☐ Sleep disorders
☐ OTHER: _____	☐ OTHER: _____

3. LIVING HABITS

BEFORE SURGERY	AFTER SURGERY
3.1 Consumption of alcoholic drinks ☐ YES ☐ NO Which ones? _____ _____ Frequency: _____	**3.1** Consumption of alcoholic drinks ☐ YES ☐ NO Which ones? _____ _____ Frequency: _____
3.2 Smoking ☐ YES ☐ NO How many cigarettes/day?_____ If you have already quit, how long? _____	**3.2** Smoking ☐ YES ☐ NO How many cigarettes/day?_____ If you have already quit, how long? _____
3.3 Practice of physical activity ☐ YES ☐ NO Which ones: _____ _____ How many days/week? _____ Time (min): _____ ☐ Regularly ☐ Irregularly	**3.3** Practice of physical activity ☐ YES ☐ NO Which ones: _____ _____ How many days/week? _____ Time (min): _____ ☐ Regularly ☐ Irregularly

4. DATE OF BARIATIC SURGERY

____/____/_____

5. ANTHROPOMÉTRIC EVOLUTION

BEFORE SURGERY	AFTER SURGERY
Maximum body weight: _____kg	Current body weight: _____kg
Pre-op weight: _____ kg	Minimum weight: _____kg
Height: _____ meter	Post-op BMI: _____
IMC pré operatório: _____	**% excess weight loss:** _____
Ideal weight: _____	
Excess weight: _____	

ANNEX A- BAROS QUESTIONNAIRE ADAPTED TO THE PORTUGUESE LANGUAGE

1. Comparado ao tempo antes de meu tratamento de perda de peso eu me sinto:

❑ Muito pior sobre mim ❑ Pior sobre mim ❑ O mesmo ❑ Melhor sobre mim ❑ Muito melhor sobre mim

2. Eu sou capaz de participar fisicamente em atividades:

❑ Muito menos ❑ Menos ❑ O mesmo ❑ Mais ❑ Muito mais

3. Estou disposto a me envolver socialmente:

❑ Muito menos ❑ Menos ❑ O mesmo ❑ Mais ❑ Muito mais

4. Eu sou capaz de trabalhar:

❑ Muito menos ❑ Menos ❑ O mesmo ❑ Mais ❑ Muito mais

5. Estou interessado em sexo:

❑ Muito menos ❑ Menos ❑ O mesmo ❑ Mais ❑ Muito mais

Results and discussion

The final sample comprised 56 outpatients in a postoperative period of 6 to 18 months after a Fobi-Capella bariatric surgery, aged 46 years on average (SD= 9.61), of which 84% were female (n=47) and 16% male (n=9). The maximum number of patients that could be possible to include in the survey was 77, and 21 individuals (29.9%) were excluded for not having attended the nutritional appointment.

With respect to the post-op time, group 1 had a total of 20 patients (36%); group 2, 21 patients (37%); and group 3, 15 patients (27%). The variables found between the groups were characterized as independent of each other and were used to outline the anthropometric profile and perception of quality of life in some post-op periods.

In the studied sample, female individuals were the majority, which corroborates the studies conducted by Rangel et al.[16] and Oliveira et al.,[17] who found prevalence of 76.6% and 84.4%, respectively, for women undergoing bariatric surgery. Epidemiological data in Brazil and abroad indicate that obesity affects people regardless of gender; however, when it comes to bariatric surgery as treatment for obesity, the frequency of women is higher.

Another study conducted in the USA by Farinholt et al.[18] pointed out that women are four times more susceptible to seeking bariatric surgery than men; the severity and frequency of complications related to excess weight are higher in men. Although the aim of the present work was not to analyze the difference between female and male, it is important a more in-depth investigation on the gender difference in the search for obesity treatment and possible associated factors.

The average age of the individuals of this research was similar to the study by Cunha et al.,[19] who found a mean age of 43.1 ± 7.7 years. The most frequent educational levels were incomplete primary school (46%) and complete secondary school (23%), data that were similar to those found in the study conducted by Germano et al.[20] in João Pessoa-PB, who investigated the nutritional profile of 51 patients of bariatric surgery. The authors found that, among the educational levels, there was predominance of complete secondary school, followed by incomplete primary school. Table 1 describes the sociodemographic characteristics such as sex, age, and educational level of the patients investigated.

Table 1. Sociodemographic characteristics of individuals who underwent bariatric surgery at a public hospital in Goiânia-GO (2016).

Variable	Total sample
Sex (%)	
Female	84% (n=47)
Male	16% (n=9)
Age (years)	46 ± 9.45
Education	
Incomplete primary school (%)	46% (n=26)
Complete primary school (%)	11% (n=6)
Incomplete secondary school (%)	7% (n=4)
Complete secondary school (%)	23% (n=13)
Incomplete higher education (%)	5% (n=3)
Complete higher education (%)	8% (n=4)

The mean age found in the sample, considering the post-op period, was 131.1 ± 26,85 kg, varying from 91 to 190 kg. The BMI values ranged from 35.4 and 73.7 kg/m2, with an average of 50.1 ± 8.37 kg/m2, corroborating data reported by Cunha et al.,[19] who found a pre-op mean BMI value of 51.2 kg/m2 (40.2-74.1kg/m2).

Weight loss before surgery was 8.7% (SD 6.5), which is in agreement with an estimated loss of 10% of the maximum weight, as set out in the protocol of the hospital under study, and which also matches the recommended levels for a good preparation and better changes of success of the surgery. Weight loss before surgery must be encouraged in order to reduce obesity-associated comorbidities and surgical complications and ensure better post-op outcomes.[21]

There was a significant difference between the groups (p= 0.014) regarding weight loss in the pre-op period, which was higher in patients 18 months after the surgery. A suggested explanation for this difference may be the fact that this group exhibited higher values of maximum weight attained in lifetime (mean weight 161.2kg) and weight before surgery (mean weight 141.6kg) compared to the groups of six and 12 months, and the patients were encouraged to lose the maximum weight as possible before surgery.

After the bariatric surgery, the average weight found was 92.6 kg ± 18.63, and the post-op BMI was 35.5 kg/m² (24.92-60.66 kg/m²). Slightly more than half of the sample (55%) attained, until the collection time, a BMI higher than 25 kg/m2 and lower than 35 kg/m2, which is classified by the WHO as grade 1 obesity. This data is considered positive since it shows a reduction in the obesity level and close proximity to the ideal weight.

Based on the "excess weight" value, it was calculated the percentage of weight excess loss relative to the pre-op weight, resulting in an average loss of 60.4% ± 15.71 and a greater loss in the group of individuals with 12 months after surgery, i.e., 66.15% (p= 0.005). Most of the participants with 6-18 months after surgery (79%) attained more than 50% EWL, a key parameter in defining a successful surgery. The percentage of excess weight loss of at least 50%, as long as it is maintained over the years, is one of the references to interpret the indicator of success.[22] Table 2 shows the anthropometric data of the individuals investigated.

Table 2. Anthropometric characteristics of individuals who underwent bariatric surgery at a public hospital in Goiânia-GO (2016)

Variable	Total sample	6m PO	12m PO	18m PO	p-value[a]
Maximum body weight (kg)	144.4 ± 32.29	144.1±30.73	135.33±22.83	161.2±40.35	0.135
Pre-op weight (kg)	131.1 ± 26.85	130.8±23.48	126±22.27	141.6±34.83	0.471
Pre-op BMI (kg/m2)	50.1 ± 8.37	49.9±9.07	49.046.07	52.6±9.95	0.661
Pre-op weight loss (%)	8.7 ± 6.5	8.3±8.43	6.93± 4.16	11.9±4.68	0.014
Ideal weight (kg)	65.3 ± 7.48	65.8±6.73	64.03±6.26	67.1±9.74	0.639
Weight excess (kg)	65.9 ± 23.06	65± 22.07	61.97±18.14	75.5±28.99	0.506
Post-op weight (kg)	92.6 ± 18.63	100.1± 20.22	85.48±12.94	93.8±19.72	0.067
Post-op BMI (kg/m2)	35.5 ± 6.99	38.3± 8.54	33.35±3.71	35.3±7.10	0.180
% of excess weight loss	60.4 ± 15.71	51.1± 15.03	66.15±12.86	65.8± 12.86	0.005

a. T-test for independent samples

b. PO = post-op

Obesity is related with an increased risk of developing other kinds of associated chronic diseases and higher mortality rates.[4] Based on the respondents' reports, the majority had one or more associated comorbidities (96.4%) and only two individuals (3.6%) did not have any disease before the surgery. The most frequent diseases were high blood pressure (84%), type 2 diabetes (64%) and dyslipidemias (59%) (p<0.001).

In the study conducted by Barros et al.,[23] who also assessed clinical conditions of 92 patients undergoing bariatric surgery in Fortaleza-CE, hypertension was the most prevalent disease (50%), followed by type 2 diabetes and dyslipidemias, both with a frequency of 13% (p=0.001). Similarly, Costa et al.[24] and Diniz et al.[25] found hypertension as the most frequent comorbid disease among the samples investigated, of 63.49% and 63.2%, respectively. The investigated profile underlines the high prevalence of obesity-related diseases, as pointed out in the literature, and high rates of improvement in the first years after surgery due to weight loss.

The percent of improvement of comorbidities after the surgery was satisfactory and with significant difference (p<0.001). The best results included improvement of sleep disturbances (94%), dyslipidemias (91%) and diabetes (86%). The lowest percentage of improvement was for osteoarthrosis (43%), probably due to a lower possibility of reversing this disease, even with a positive evolution of weight loss. Table 3 contains data on comorbidities before and after the bariatric surgery, as reported by the patients studied.

In 2015, a research was conducted to assess the impact of bariatric surgery on the quality of life of patients in the state of Goiás, with similar objectives to the present analysis. The most prevalent pre-op comorbidities in the targeted population were high blood pressure, dyslipidemias and diabetes, with good improvements after a bariatric surgery – 77%, 100% and 100%, respectively – data that are similar to the present findings.[26]

Table 3. Self-reported pre-op and post-op comorbidities in individuals who underwent bariatric surgery at a public hospital in Goiânia-GO (2016).

Variable	Pre-op comorbidities N (%)		Post-op comorbidities N (%)		N total	Improved comorbidities (%)	p-value[b]
	No	Não	Yes	No			
Hypertension	47 (84%)	9 (16%)	18 (32%)	38 (68%)	56	62	<0.001
Type2DM	36 (64%)	20 (36%)	5 (9%)	51 (91%)	56	86	<0.001
Dyslipidemias	33 (59%)	23 (41%)	3 (5%)	53 (95%)	56	91	<0.001
Osteoarthritis	28 (50%)	28 (50%)	16 (29%)	40 (7%)	56	43	<0.001
Lower back pain	31 (55%)	25 (45%)	11 (20%)	45 (80%)	56	65	<0.001
Sleep disorder	18 (32%)	38 (68%)	1 (2%)	55 (98%)	56	94	<0.001

a. Values consist of total and percent number

b. Paired t-student test

For the "living habits" variable, drinking, smoking and physical activity were measured. Among the respondents, 32% (n=18) mentioned that they drank alcoholic beverages occasionally before the bariatric surgery, which included fermented drinks like beer and wine. After the surgery, only 3.7% of the individuals commented that they drank occasionally. These results are similar to those of a study conducted in Recife-PE by Amorim et al.,[27] about the consumption of alcohol in the pre-op and post-op period of bariatric surgery. These authors found that 26.6% of the patients drank alcoholic beverages in the pre-op period, with predominance of beer. It can be inferred that the reduced consumption of alcohol observed after the surgery may be related to an effective nutritional guidance provided by the multi-professional team of the hospital where the present study was conducted, which discourages alcohol intake for at least 12 months before the surgery. Furthermore, it may have occurred underreporting of information.

Regarding the smoking habit, it was found that 25% (n=14) of the sample were former smokers before the surgery. They had quit this habit in a period that varied from one to 27 years (13 years on average). In the post-op period, all patients reported not smoking. Smoking is a serious risk factor to imbalance health condition and is considered an unhealthy habit. The protocol of the healthcare unit recommends to stop smoking at least two months before the surgery, and this occurred as expected.

Before the bariatric surgery, 59% of the individuals did not practice physical exercises, and 41% (n=23) reported some physical activity, walking being the most cited modality. After the surgery, 40 patients (71%) reported that they practiced physical exercises. Of the 23 individuals that practiced exercises before the surgery, all of them said that they maintained the habit (p= 0.001). Physical activity is part of a healthy lifestyle, important to lose and maintain weight over time. The sedentarism identified in the pre-op period may be related to functional limitations caused by excess weight, presence of some comorbidities, lack of time, physical and financial constraints, self-esteem, among others.

The assessment of quality of life was made using the BAROS questionnaire, with five domains: self-esteem, willingness to practice physical activities, performance at work, social interaction and practice of sexual activity. Of the total sample, 27% of the individuals considered their quality of life better and 73% as much better. No individual considered his quality of life worse, or much worse or unchanged after the bariatric surgery (Table 4).

Table 4. Perception of quality of life in individuals who underwent bariatric surgery at a public hospital in Goiânia-GO as proposed by the BAROS[a] method (2016).

Life quality variable	Total sample % (n)	Group 1 % (n)	Group 2 % (n)	Group 3 % (n)	p-value[b]
Much worse	-	-	-	-	-
Worse	-	-	-	-	-
Unchanged	-	-	-	-	-
Better	27% (15)	20% (4)	38% (8)	20% (3)	0.261
Much better	73% (41)	80% (16)	62% (13)	80% (12)	

a. BAROS (*Bariatric Analysis and Reporting Outcome System*).

b. Kruskal-Wallis test.

c. Group 1 = 6 months after surgery; Group 2 = 12 months after surgery; Group 3 = 18 months after surgery.

When analyzing the three postoperative periods and the individuals who had a weight loss below and above 50%, there were no significant differences. However, it should be noted that six months after the surgery, the patients already indicated improvement in their perception of quality of life. Table 5 shows the relationship between weight loss and perception of quality of life.

Table 5. Relationship between excess weight loss and perception of quality of life in individuals who underwent bariatric surgery at a public hospital in Goiânia-GO (2016).

Variable[b]	% EWL[c]< 50 (n=12)	% EWL >50 (n=44)	p-value[d]
Self-esteem	0.88 ± 0.23	0.95 ± 0.15	0.163
Physical activity readiness	0.38 ± 0.17	0.43 ± 0.12	0.273
Performance at work	0.40 ± 0.17	0.39 ± 0.20	0.929
Social interaction	0.33 ± 0.19	0.33 ± 0.22	0.963
Sexual activity	0.33 ± 0.19	0.21 ± 0.28	0.188
Final classification	2.31 ± 0.64	2.29 ± 0.66	0.975

a. Values are mean ± standard deviation

b. Average per variable: self-esteem (0-1); motivational readiness for physical activity, performance at work, social interaction and sexual activity (0-0.5); final classification (0-3).

c. EWL= Excess weight loss

d. Non-parametric Wilcoxon Mann Whitney's test

In another investigation conducted in the state of Goiás, 8% of the patients reported that they felt better after the surgery and 92% much better, corroborating the profile found in this study.[26] It can be inferred that the weight loss attained in the first months and still before the weight stabilization, already ensures better quality of life, not being necessarily associated with a better perception according to a greater weight loss.

The BAROS instrument, however, was not entirely used in the survey to assess the outcome/success of the bariatric surgery due to limitations of the healthcare unit under study such as lack of standardized reports on postoperative complications and reevaluation of comorbidities. The BAROS instrument is considered the most effective way to assess surgical treatment of obesity as a whole. However, numerous failures have been pointed out by researchers, due to limitations in its design such as the impossibility of comparing pre-op and post-op health states, values which are expressed in nominal categories for each domain, grouping in the same way individuals with different characteristics and outcomes, limitation of the comorbidities listed to be assessed, among others.[28]

The results achieved confirm the importance of losing weight to reduce risk factors, improve associated diseases, improve quality of life and reduce mortality rates. One of the study limitations was its cross-sectional design, using a single analysis to characterize an aspect, which makes it difficult to make associations and comparisons. In future investigations it would be suggested the conduction of prospective studies, with monitoring of a single group over a period of time, with use or not of a control case, so that anthropometric changes in habits and quality of life may be investigated with more details and more associations.

A revision of BAROS or the development of another instrument to assess the results of surgical treatment of obesity is important for more reliable, consistent analyses, more standardization of collected data and comparisons between different studies.

In addition, other key issues that may be associated in future studies could be the characterization of a dietary profile before and after the surgery, use of supplements, biochemical tests, basal metabolic rate, total energy expenditure. So, interpretations may be better founded or supported and be related to weight loss, discontinuance and adoption of habits and improvement of quality of life.

Conclusion

The study indicated that the bariatric surgery has contributed to high weight loss, improvement and/or solution of associated comorbidities and improved quality of life before weight loss is stabilized. The study also found healthy habits and health protectors such as a low prevalence of drinking, no-smoking and practice of physical activity. The proposed objectives were achieved,

and the studied sample highlights the bariatric surgery efficacy in treating obesity in case of inability to achieve a sustained weight loss with conventional treatments and according to indication criteria. However, it also underlines the importance of assessing the surgery success over a longer postoperative time, aiming to observe if weight is maintained or regained, if comorbidities are well controlled or solved and the presence of deficiencies in nutrition and lifestyles.

It is also suggested the carrying out of other research studies to investigate the concept of quality of life and its domains and the nutritional and dietary profile of patients undergoing bariatric surgery.

Collaborators

Maia RP collaborated in the conception of the study, data collection, data analysis and interpretation, and in writing the manuscript; Silva PCC collaborated in the conception of the study and data collection; Duarte ACS participated in the supervision and revision of the manuscript; Costa RM participated in the co-supervision of the study and revision of the manuscript.

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