

Impact of Bariatric Surgery on Quality of Life

Impacto da Cirurgia Bariátrica na Qualidade de Vida

Impacto de la Cirugía Bariátrica en la Calidad de Vida

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Artigo Original

Abstract

Objective: The aim of this study is to evaluate the impact of bariatric surgery on quality of life in obese patients.

Methods: Observational, longitudinal, prospective, analytical study, which included 50 obese patients. Data collection, including socioeconomic information, anthropometric numbers and questionnaire Impact on Weight on Quality of Life-Lite (IWQOL-Lite), was performed before and one year after bariatric surgery. Characteristics of the sample were assessed by descriptive

statistics. Paired t test was used to analyse anthropometric and biochemical data. Domains and total score of IWQOL-Lite were analysed by the Wilcoxon test, adopting a significance level of 5%. Results: After bariatric surgery, quality of life in all areas covered in the questionnaire had significant improvement ($p < 0.001$). The total score also increased (physical function: 24.36 to 90.32; self-esteem: 35.71 to 94.50; sex life: 50.38 to 92.88; embarrassment in public: 22.50 to 97.70; work: 40.00 to 98.50; total score: 32.19 to 93.84). There was a significant

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reduction ($p < 0.001$) in the frequency of diabetes, hypertension, dyslipidemia, anthropometric and biochemical measurements. Conclusion: The results show that the weight loss determined by bariatric surgery leads to significant improvement in quality of life in all evaluated domains (physical function, self-esteem, sexual life, social and professional relationships).

Descriptors: Quality of Life; Comorbidity; Obesity; Bariatric Surgery; Surveys and Questionnaires.

Resumo

Objetivo: Avaliar o impacto da cirurgia bariátrica na qualidade de vida em obesos. Métodos: Estudo observacional, longitudinal, prospectivo e analítico, incluiu 50 pacientes obesos. A coleta de dados, incluindo informações socioeconômicas, antropométricas e o questionário Impact on Weight on Quality of life-Lite (IWQOL-Lite), foi realizada antes e após um ano da cirurgia bariátrica. Para análise da caracterização da amostra foi realizada a estatística descritiva. Utilizou-se o teste t pareado na análise das variáveis antropométricas e dosagens bioquímicas e o teste de Wilcoxon para análise dos domínios e escore total do

IWQOL-Lite, adotando-se nível de significância de 5%. Resultados: Após a cirurgia bariátrica, observou-se melhora significativa (p -valor $< 0,001$) na qualidade de vida em todos os domínios abordados no questionário e no escore total (função física: 24,36 – 90,32; autoestima: 35,71 – 94,50; vida sexual: 50,38 – 92,88; constrangimento em público: 22,50 – 97,70; trabalho: 40,00 – 98,50; escore total: 32,19 – 93,84). Houve redução significativa (p -valor $< 0,001$) na frequência de diabetes, hipertensão e dislipidemia, nas medidas antropométricas e nas dosagens bioquímicas. Conclusão: Os resultados mostram que a perda de peso determinada pela cirurgia bariátrica leva à melhora significativa da qualidade de vida, em todos os domínios avaliados (função física, autoestima, vida sexual, relações sociais e profissionais).

Descritores: Qualidade de Vida; Comorbidade; Obesidade; Cirurgia Bariátrica; Inquéritos e Questionários.

Resumen

Objetivo: Evaluar el impacto de la cirugía bariátrica en la calidad de vida en obesos. Métodos: Estudio observacional, longitudinal, prospectivo

y analítico, incluyó a 50 pacientes obesos. La recolección de datos, incluyendo información socioeconómica, antropométrica y el cuestionario *Impact on Weight on Quality of life-Lite (IWQOL-Lite)*, se realizó antes y después de un año de la cirugía bariátrica. Para el análisis de la caracterización de la muestra se realizó la estadística descriptiva. Se utilizó el test *t* pareado en el análisis de las variables antropométricas y dosificaciones bioquímicas y la prueba de Wilcoxon para el análisis de los dominios y la puntuación total del *IWQOL-Lite*, adoptando un nivel de significancia del 5%. Resultados: En el caso de la cirugía bariátrica, se observó una mejora significativa (*p*-valor <0,001) en la calidad de vida en todos los ámbitos abordados en el cuestionario y en el score total (función física: 24,36 - 90,32, autoestima: 35, Y en el caso de las mujeres, en el caso de las mujeres, . Se observó una reducción significativa (*p*-valor <0,001) en la frecuencia de la diabetes, la hipertensión y la dislipidemia, en las medidas antropométricas y en las dosificaciones bioquímicas. Conclusión: Los resultados muestran que la pérdida de peso determinada por la cirugía bariátrica lleva a la mejora significativa de la calidad de vida, en

todos los dominios evaluados (función física, autoestima, vida sexual, relaciones sociales y profesionales).

Descriptor: Calidad de Vida; Comorbilidad; Obesidad; Cirugía Bariátrica; Encuestas y Cuestionarios.

Introduction

Obesity is a multifactorial disease; the conventional treatment involves dietary counseling, pharmacotherapy and physical activity. However, in severe cases these actions have poor results, determining the need for more effective interventions, such as bariatric surgery. The surgical approach leads to the most significant weight loss, improves metabolic comorbidities and reduces mortality. Pre-operative candidates includes body mass index (BMI) above 40 kg/m² or a BMI between 35 and 40 kg / m² with concomitant obesity related diseases⁽¹⁾.

Morbid obese patients have higher probability of clinical, psychological and musculoskeletal disorders that compromise their quality of life. The weight reduction determined by gastroplasty leads to increased self-esteem, social relationship and general health, which suggest improvement in quality of life. Therefore, the main

outcome of the surgery should not be evaluated only with reference to weight loss, but also regarding the positive impact of this loss in mental and physical health⁽²⁻⁴⁾.

However, there is variability in postoperative outcomes in different groups of patients. This may happen by the development of new disorders, related to the invasive nature of bariatric surgery or to the poor resolution of previous comorbidities, which should be regarded as factors that compromise the expected progress in quality of life⁽⁵⁻⁹⁾.

The IWQOL-Lite questionnaire has been used as a reliable representation of the impact of weight in different aspects of life, and the difference of this impact before and after bariatric surgery⁽¹⁰⁾.

Taking into consideration the harm caused by obesity on mental and physical health, in addition to the effectiveness of surgical treatment to permanent weigh loss, this study aims to evaluate the impact of weigh in quality of life before and after gastroplasty.

Method

Study Population

A total of 50 patients with severe obesity were selected to this study. This group was diagnosed by General Practitioners and referred to the Department of Nutrition and Gastric Surgery service at University Hospital Professor Alberto Antunes. They are part of a group of candidates for bariatric surgery with follow-up of a multidisciplinary team of nutritionists, psychologists, surgeons and cardiologists.

Patients were submitted to the same evaluation standards, which consisted of: clinical history, physical examination (blood pressure, weight, height, waist circumference), 12 leads ECG, Echocardiogram and biochemical study (fasting blood sugar, total cholesterol, LDL cholesterol, HDL-cholesterol, triglycerides). Other cardiac examinations were requested according to individualized clinical indications.

Assessment

A scale manufactured by WELMY COMPANY was used to measure weight and height. For the measurement of waist circumference (WC), the largest waist circumference between the last rib and the iliac crest was considered, as recommended by WHO (World Health Organization)⁽¹¹⁾.

Reference values for the analysis of BMI were based on WHO parameters: values of 18.5 kg/m² to 24.9 kg/m² indicate normality; 25 kg/m² to 29.9 kg/m², overweight; 30 kg/m² to 34.9 kg/m², obesity class I; 35 kg/m² to 39.9 kg/m², obesity class II and ≥ 40 kg/m², obesity class III. WC was considered abnormal if greater than 94 cm for men and 80 cm for women, and these values are indicative of increased cardiovascular risk⁽¹¹⁾.

Instruments

The IWQOL-Lite is a well established and reliable self-rating questionnaire to assess quality of life related to the impact of weight in different domains of health. This questionnaire identifies and quantifies the effect of obesity in every day life⁽¹²⁾.

The IWQOL-Lite has 31 items and assesses five domains: 11 questions related to physical function (FF), 07 questions related to self-esteem (AE), 04 questions about sex life (VS), 05 questions involving embarrassment in public (CP) and 04 questions related to work (TR). Patients rank their answers on a scale of 1 to 5, at which 1 indicates "not true" and 5 indicates "always true". The score obtained at the end of the questionnaire ranges from 0 to 100, with

a higher score meaning a better quality of life. The Portuguese version of the questionnaire showed good psychometric property⁽¹³⁻¹⁵⁾.

Statistical Methods

The characteristics of the sample were analyzed using descriptive statistics, including the calculation of averages and standard deviations for each variable. The Kolmogorov-Smirnov test was performed to assess whether the results corresponded or differed from the normal distribution of dependent and independent variables. After the identification of symmetrical distribution, paired t test was employed to examine anthropometric and biochemical measurement variables.

Variables related to the five health domains and to the IWQOL-Lite questionnaire total score did not present normal distribution; therefore their examination was conducted using the Wilcoxon test. Analysis was performed in SPSS software version 16.0, at a significance level of 5%

Ethical Issues

All patients provided written informed consent prior to assessment. The Ethics Committee of the Federal University of Alagoas approved the

study.

women, aged between 22 and 60 years, with a mean of 39.8 (\pm 9.7) years and a median of 38.5 years. The characteristics of the sample are shown in Table 1.

Results

The study sample consisted of 50 individuals, which 48 of them were

Table 1: General Characteristics of the Sample Studied

Variable	N	Frequency (%)
Age		
≥ Median	26	52
< Median	24	48
Scholarity		
Analphabetism	1	2
Elementary school incomplete	7	14
Elementary school complete	10	20
High School incomplete	3	6
High School complete	14	28
Vocational school complete	4	8
Graduation incomplete	2	4
Graduation complete	9	18
Place of Birth		
Capital	35	70
Country side	15	30
Civil Status		
Married	25	50
Divorced	2	4
Single	23	46
Tobacco Smoking		
Non smoker	44	88
Former smoker	6	12
Smoker	0	0
Alcoholism		
Non alcoholic	33	66
Former alcoholic	2	4
Alcoholic	15	30
Morbidity		
HBP	35	70
Dyslipidemia	19	38
DM	11	22
Hypothyreoidism	6	12

HBP – High Blood Pressure; DM - Diabetes Mellitus.

The data analysis of IWQOL-Life questionnaire applied preoperatively and postoperatively, is described in Table 2. Such table shows that in the

preoperative assessment, considering all evaluated domains, public embarrassment had the highest negative impact on obese quality of life,

followed by physical function, self-esteem, work and sex life.

In postoperative evaluation, public embarrassment and physical function obtained the highest improvement. Additionally, there was a

significant increase in all of the selected quality of life aspects, as well as in the total score, with statistical significance ($p < 0.001$) between preoperative and postoperative evaluation (Table 2).

Table 2: Mean and Standard Deviation of the Two Groups on Quality of Life (IWQOL-Life)

Variables	Pre-operative	Postoperative	p Value
Physical Function	24,36 ± 23,09	90,32 ± 7,98	<0,001*
Self esteem	35,71 ± 32,14	94,50 ± 9,66	<0,001*
Sexual Life	50,38 ± 41,94	92,88 ± 19,89	<0,001*
Social relationship	22,50 ± 27,96	97,70 ± 6,56	<0,001*
Professional relationship	40,00 ± 35,47	98,50 ± 4,65	<0,001*
Total	32,19 ± 23,66	93,84 ± 5,77	<0,001*

Data presented as mean and standard deviation, Wilcoxon test was used to calculate significant statistical difference ($p < 0,05$).

Also, the frequency of several comorbidities decreased, such as the frequency of Diabetes Mellitus (from 22% to 8%), of Hypertension (from 70% to 32%), and Dyslipidemia (from

38% to 4%). One year after gastroplasty, surgery was indicated for incisional hernia repair to 28% of patients, and for cholecystectomy to 18% of patients.

Table 3: Pre-Operative and Postoperative Anthropometric Characteristics of 50 Obese Patients

Variables	Pre-operative	Postoperative	p Value
Weight	124,40 ± 16,77 (84-149,50)	82,85 ± 13,72 (58,60-115,50)	<0,001*
BMI	48,35 ± 5,22 (38,59-66,62)	33,01 ± 4,63 (24,43-47,76)	<0,001*
WC	130,80 ± 10,60 (110-150)	101,34 ± 14,33 (43,50-126)	<0,001*

Data presented as mean and standard deviation, *maximum and minimum* (); BMI – Body Mass Index; WC – Waist Circumference; T test was used to calculate significant statistical difference ($p < 0,05$).

Table 3, shows the group anthropometric data in two different moments. There was statistical significance regarding weight reduction,

BMI and WC. However, the mean BMI remained above 30 kg/m² and the average WC remained above 100cm, indicating overweight and increased

cardiovascular risk, even one year after gastroplasty.

Taking as reference the values of Xavier et al, before the procedure, 12% of the sample had total cholesterol levels above 240 mg/dl, 44% had HDL

cholesterol below 40 mg/dl, 14% had LDL over 160 mg/dl, 16% had triglycerides above 200 mg/dl and 34% had fasting glucose above 100 mg/dl⁽¹⁶⁾.

Tabela 4: Pre-Operative And Postoperative Biochemical Characteristics Of 50 Obese Patients

Variáveis	Pre-operative	Postoperative	p Value
Triglycerídes	145,44 ± 55,52	83,99 ± 24,19	<0,001*
Glucose	99,96 ± 34,97	79,32 ± 11,76	<0,001*
HDL	42,22 ± 8,69	47,06 ± 8,44	0,001*
LDL	125,53 ± 36,64	98,33 ± 26,37	<0,001*
Total Cholesterol	199,60 ± 42,59	159,05 ± 30,79	<0,001*

Data presented as mean and standard deviation; HDL – high density lipoproteins; LDL – low density lipoproteins; T test was used to calculate significant statistical difference ($p < 0,05$).

After surgery, no patient had triglyceride levels above 200 mg/dl. Only 2% of patients remained with total cholesterol, LDL-cholesterol and fasting blood sugar above the normal limit, and 24% of them with HDL-cholesterol levels below 40 mg/dl. Significant differences were found when comparing the results of biochemical tests evaluated before and after surgery (Table 4).

Discussion

Obesity is a public health challenge and has increased its prevalence in Brazil, with remarkable growth in the Northeast and in urban areas, especially among women⁽¹⁷⁾. The

population of this study is characterized by young individuals, with a mean age of 39.8 years, and composed mostly by women, coming from the capital. These characteristics do not differ from the epidemiological profile mentioned above.

The study participants were diagnosed with obesity grades II and III, and received surgical treatment for obesity, which resulted in significant improvement in anthropometrical and biochemical profiles one year after the intervention^(11,14,18).

One year after bariatric surgery, the group's BMI and WC still remained above normal values by OMS11. As a result of weight loss, there was a reduction in the frequency of all

investigated metabolic comorbidities^(21,23).

In addition to adverse consequences to health, obesity is associated with a reduction in the quality and life expectancy. Oh et al described the importance of assessing not only the physical aspect of patients undergoing bariatric surgery, but also their social and mental profile, which strongly influence the quality of life⁽²⁴⁾.

The IWQOL-Lite questionnaire is recommended as the optimal specific instrument to assess quality of life in obese patients and should preferably be applied continuously during the course of life⁽¹⁰⁾. The difficulties involving a persistent research might explain the lack of longitudinal and prospective studies about obese patient's quality of life, before and after gastroplasty.

This study was conducted in a hospital that provides regular and ongoing outpatient treatment. For this reason, there was no loss of patients in the follow-up.

In the group studied, patients had a severely impaired quality of life before treatment (32.19 ± 23.66), which improved significantly after bariatric surgery (93.84 ± 5.77). This result corroborates that this procedure is efficient, not only in reducing the weight and improving the

comorbidities, but also in providing a positive evolution in the quality of life.

Strain et al did not observe the normalization of BMI in the sample after bariatric surgery, as observed in this study, but detected significant improvement in quality of life of individuals⁽²⁵⁾. They observed that, after surgery, weight loss patients led to an assessment of quality of life similar to that of the normal population, regardless of the persistence of some degree of overweight or even obesity.

Evaluating each domain separately, the present data showed significant results in all fields of the questionnaire, the most significant being those related to embarrassment in public, physical function and self-esteem, as seen in some other studies using the same instrument^(12,22,23,25).

The embarrassment in public and self-esteem are related to the psychological profile of the obese, to the impact of prejudice and to the way they are accepted in the community. In morbidly obese patients there may be a rise in the frequency of psychopathologies, including mood disorder, depression and eating disorders. Such pathologies may weaken the success of the surgical treatment.

Apovian et al evaluated 543 patients and diagnose depression in 54% of patients who underwent gastric banding and 52% who underwent gastric bypass, which is the third most frequently identified comorbidity.²⁶ When asked what factors motivated them to lose weight and look for surgical treatment, appearance or shame were present in 65% of patients that underwent gastric banding and in 70% of patients undergoing gastric bypass.

Wee et al identified in their sample that obese patients accept the risk of death by 13% to reach your optimal weight⁽²¹⁾. They also concluded that living with obesity brings losses similar to those suffered by patients living with other serious chronic diseases, and may lead to the occurrence of psychosocial problems inherent to prejudice and to society's distorted values.

During the interview and application of the questionnaires in this study, patients reported constant embarrassment in everyday life, such as when they went shopping for clothes or to the movies (for the lack of adapted chairs), and in other daily situations, at which they frequently felt ashamed of their appearance^(27,28). In some cases, patients decided for the annulment of social life, restricting themselves to their

homes and to their families. In this regard, the data shows that weight loss caused by surgical treatment improved self-esteem and stimulated the restoration of patient's social life⁽²⁸⁾.

Marchesini identified that the most common factors of encouragement for the pursuit of gastroplasty are social discrimination and aesthetic concerns, which corresponded to a total of 54.3% of the factors answered by patients⁽²⁷⁾. These factors were also evaluated in this research.

As for physical impairment, obesity generates overloads, especially in the joints of the lower limbs and spine. After bariatric surgery, musculoskeletal pain tends to reduce, improving the individual's functional capacity.

Grand et al, using the SF-36 questionnaire, conducted a prospective study that evaluated quality of life and prevalence of musculoskeletal pain in 26 obese patients before and after bariatric surgery⁽⁵⁾. After 40 months, the prevalence of pain in the knees, lower back, hips and ankles reduced significantly, reaching 0% in some patients. The same study showed that quality of life, functional capacity and physical appearance also had significant improvement after bariatric surgery, as

observed in this study, despite the use of different instruments.

Barros et al described the physical activity increase of 23.1% after gastroplasty, a variable of great importance to maintaining body weight.⁷ They realized that the reduction in weight and joint pain postoperatively promoted an increase in exercise frequency. It can be related to the improvement of physical function domain in this study.

Regarding the work domain Almeida et al observed that patients who had no occupational activity had a higher BMI and also concluded that the severity of the obesity is directly proportional to the difficulty to work and be accepted in the professional market.²⁹ In the sample of patients of the present study, it was observed significant improvement in the labor area after surgery, leading to the inference that weight reduction induces patients to become more confident and willing to work, as observed in other major literature^(6,21).

Issues related to sexual life were the most complicated to be answered by patients, due to taboos or to nonexistent sexual life. Many confided that they had no sexual activity because of embarrassment, insecurity or fear of rejection by the partner. Obesity

interferes with the individual's sexuality in many ways: lack of physical resistance, impaired mobility, fear of rejection and low self-esteem. Morbidly obese can have the quality of sexual life compromised by dysfunctions that affect orgasm and sexual desire. Moreover, obese patients often develop diseases associated with risk factors for sexual dysfunctions, such as diabetes and cardiovascular disease. This study's postoperative evaluation revealed the resolution of many of these aspects, promoting an increase in the Sex Life domain (VS)⁽³⁰⁾.

For all these reasons, the reduction of weight determined by bariatric surgery in the first year had a positive impact on the control of metabolic comorbidities, self-awareness and mental health. Based on these concepts, one might conclude for the efficacy of the gastroplasty treatment of obesity⁽³¹⁾.

Conclusion

This study shows that the evaluation of quality of life is a very important aspect to be incorporated as a predictor of the success of surgical treatment for obesity. The use of a suitable research tool demonstrates the effect of weight reduction in quality of

life as a whole, as well as its various domains, and consequently guide the adoption of new strategies to further improve the quality of life for the obese.

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