

Study of sexual function in women who underwent bariatric surgery

Estudo da função sexual em mulheres submetidas a cirurgia bariátrica

Lissa Cerosino de Souza¹, Krislainy de Sousa Corrêa²,
Gabriella Assumpção Alvarenga Schimchak³

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RESUMO: *Introdução:* A Cirurgia Bariátrica (CB) surge como forma de tratamento de várias comorbidades associadas à obesidade, e pode estar associada a melhora significativa tanto da qualidade de vida quanto da função sexual de mulheres submetidas ao procedimento cirúrgico. *Objetivo:* avaliar a função sexual, qualidade de vida e identificar a prevalência de disfunção sexual em mulheres submetidas à cirurgia bariátrica. *Método:* Estudo transversal realizado com mulheres que foram submetidas a CB e que fizeram acompanhamento em um HospitalParticular e por busca ativa. Foram aplicados os instrumentos de Índice de Função Sexual Feminina (FSFI) e qualidade de vida (BAROS). *Resultados:* Foram avaliadas 26 mulheres, que se consideraram à vontade ao falar desexo (46%), 42% consideraram que a frequência sexual após a CB aumentou, 30% consideraram que diminuiu, 50% relatam que a satisfação sexual após a cirurgia melhorou, 42% consideraram sua vida sexual boa, 26% ótima e 23% regular. A disfunção sexual teve prevalência de 38%, a média de desempenho no FSFI foi de $25,93 \pm 7,86$ pontos (Min=5 e Máx = 35,70 pontos). A qualidade de vida analisada pelo BAROS foi considerada “excelente” por 42% e “muito bom” por 38%. Houve correlação entre a função sexual (FSFI) e qualidade de vida (Baros) ($r=0,67$, $p<0,001$). Além disso, não ter disfunção sexual está associado com melhor qualidade de vida ($p=0,001$). *Conclusão:* A prevalência de disfunção sexual foi de 38,5%, sendo que a maioria das mulheres apresentou função sexual preservada. A qualidade de vida foi avaliada como excelente e muito boa, enquanto a vida sexual foi classificada de boa a ótima pela maior parte das mulheres. Qualidade de vida mostrou associação a função sexual.

Palavras-chaves: Cirurgia bariátrica; Função sexual feminina; Obesidade; Qualidade de vida.

ABSTRACT: *Introduction:* Bariatric Surgery (CB) is an approach for treating several comorbidities related to obesity and it can be associated with significant improvement in the quality of life and in the sexual function of women who undergo the surgical procedure. *Objective:* To assess sexual function, quality of life and establish the prevalence of sexual dysfunction in women who underwent bariatric surgery. *Method:* Cross-sectional study conducted with women who underwent Bariatric Surgery and were followed up in a Private Hospital or found through active search. The Female Sexual Function Index (FSFI) and quality of life (BAROS) instruments were applied. *Results:* Among the 26 women who were evaluated, 46% felt comfortable when talking about sex, 42% acknowledged that sexual frequency after Bariatric Surgery has increased, 30% reported that it has decreased, 50% reported that sexual satisfaction after surgery has improved, 42% considered their sex life to be good, 26% considered it excellent and 23% considered it regular. Sexual dysfunction had a prevalence of 38% and the mean score in the FSFI was 25.93 ± 7.86 points (Min = 5 and Max = 35.70 points). The quality of life analyzed by BAROS was considered “excellent” by 42% and “very good” by 38%. There was an association between sexual function (FSFI) and quality of life (BAROS) ($r=0.67$, $p<0.001$). In addition, not having q sexual dysfunction was associated with a better quality of life ($p=0.001$). *Conclusion:* The prevalence of sexual dysfunction was 38.5% and most women had preserved sexual function. Quality of life was rated as excellent and very good, while sex life was rated good or excellent by most women. Quality of life was associated with sexual function.

Keywords: Bariatric surgery; Female sexual function; Obesity; Quality of life.

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1. Physical therapist, graduated in physical therapy at the Pontifícia Universidade Católica de Goiás, Goiânia, Goiás, Brasil; ORCID: <https://orcid.org/0000-0001-8360-3867>. E-mail: lissacerosino25@gmail.com.
2. Master of *Atenção à Saúde*, professor of the physical therapy course at the Pontifícia Universidade Católica de Goiás, Goiânia, Goiás, Brasil; ORCID: <https://orcid.org/0000-0001-8150-4582>. E-mail: krislainycorreia@hotmail.com.
3. Master in Health Sciences, professor of the physical therapy course at the Pontifícia Universidade Católica de Goiás, Goiânia, Goiás, Brasil; ORCID: <https://orcid.org/0000-0002-3413-8302>. E-mail: gaalvarenga@hotmail.com.

Correspondence: Lissa Cerosino de Souza. Rua SP 14 Qd. 11 Lt. 19 Setor Perim. Goiânia, Goiás. CEP 74580-360. E-mail: lissacerosino25@gmail.com

INTRODUCTION

Obesity is considered a complex and multifactorial chronic disease, with genetic, behavioral, socioeconomic, and environmental origins. It is also directly associated with the risk of developing cardiovascular diseases such as systemic arterial hypertension (SAH), metabolic diseases such as diabetes mellitus (DM), musculoskeletal disorders (osteoarthritis), depression, sleep disorders (sleep apnea), biochemical changes such as hypercholesterolemia (high LDL and low HDL), hepatic steatosis and some types of neoplasia¹. In addition, obesity can affect female sexual function². Thus, the indication for bariatric surgery (BS) for the treatment of obesity has become more frequent³.

Weight loss, along with other mechanisms such as the mediation of sex hormones, are related to increases in estradiol (E2), follicle-stimulating hormone (FSH), luteinizing hormone (LH) and sex hormone binding globulin (SHGB) and decreases in testosterone (TT) and dehydroepiandrosterone sulfate (DHEA-S)⁴. Therefore, the BS is a treatment for the comorbidities associated with obesity, as it promotes the normalization of biochemical and hemodynamic variables, improving cholesterol, HDL, LDL, VLDL, triglycerides, glucose, systolic blood pressure (SBP) and diastolic blood pressure (DBP)⁵. The BS is an important tool in the treatment of obesity, with very positive results in terms of quality of life⁵.

According to the WHO, quality of life can be defined as “an individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns”. Thus, it encompasses spiritual, psychological, mental, emotional and physical well-being and social relationships, including factors such as family, friends, health, sexual function, education, housing, basic sanitation and other life circumstances⁶.

Sexual health is directly associated with quality of life and can have a greater impact on women, as decreased sexual function can have negative effects on psychological, social and emotional health⁷. It is likely that sexual function is the result of a combination of factors that are modified by the BS, such as body image, psychological and mental status, sex hormone levels and health- and weigh-related quality of life⁴.

Sexual dysfunction is multifactorial and may be related to lack of blood flow to the clitoris and vagina, neurological disorders and hormonal dysfunctions, such as hypothalamic-pituitary axis dysfunction, which leads to a decrease in estrogen and/or testosterone levels, associated with lack of sexual desire, vaginal dryness and decreased arousal⁸.

There is a high frequency of sexual dysfunctions and loss of sexual desire as a consequence of obesity.

Therefore, the treatment of this condition must address the sex life of the patient with obesity. Thus, it is necessary to assess the impact of bariatric surgery, one of the options for the treatment of obesity, on sexual function and quality of life of obese women^{8,9}.

Therefore, the objective of this study was to assess sexual function and quality of life and identify the prevalence of sexual dysfunction in women who underwent bariatric surgery.

METHOD

This is a cross-sectional observational study, approved by the Research Ethics Committee of the Pontificia Universidade Católica de Goiás (opinion no. 3.564.337).

The sample consisted of women who underwent bariatric surgery and were monitored at the Private Hospital and women recruited through active search, which is defined as searching for individuals to identify possible research participants. This process occurred with the help of four collaborators, who used their social networks to identify people who had undergone BS and were willing to collaborate with the study, in the city of Goiânia, Goiás. All women were approached while awaiting medical consultation.

Inclusion criteria were sexually active women, over 20 years old, who underwent bariatric surgery and who had had the surgery for at least 6 months. Exclusion criteria were women in the climacteric phase or menopause, women with a low level of education, women who had already undergone reconstructive surgery and women who had already had hormone replacement therapy. Data were collected from August 2019 to March 2020.

Before starting data collection, the study procedure was presented in the Informed Consent Form and the participants who accepted to be part of the study signed the form. Then, the following instruments were applied: Female Sexual Function Index (FSFI); Bariatric Analysis and Reporting Outcome System – Moorehead-Ardelt (BAROS); and a form created by the authors themselves, with objective questions about the perceptions of women.

The Female Sexual Function Index is designed to assess female sexual function, and its categories and sub-items are based on the American Foundation for Urologic Disease (AFUD) classification of female sexual dysfunction. It comprises 19 items that analyze six domains of sexual function: desire, arousal, lubrication, orgasm, satisfaction and pain, emphasizing arousal disorder. This category is subdivided into two separate domains: lubrication (four items) and arousal itself (four items), which allows the evaluation of components such as lubrication, subjective arousal and desire¹⁰. The index can evaluate each domain separately or the entire composition. Each domain has its scores, and the answer options are

scored from 0-5 in questions 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and from 1-5 in questions 1, 2, 15, 16. The score is inverted in the pain-related questions (17, 18 and 19), which are scored from 0-5. The scores of each domain are multiplied by a factor that represents their influence and then added, reaching the total score. The factor is 0.6 for desire (1,2), 0.3 for arousal (3,4,5,6) and lubrication (7, 8, 9, 10) and 0.4 for orgasm (11, 12, 13), satisfaction (14, 15, 16) and pain (17, 18, 19). The value of the scores for each domain ranges from 0 to 6 (except desire, for which the minimum is 1.2, and satisfaction, for which it is 0.8) and the total score ranges from 2 to 36. The higher the final score, the better the sexual function¹¹.

The BAROS evaluates and seeks to match the results of bariatric surgeries and is the main instrument to report the results of these surgeries. The five main aspects evaluated are weight, comorbidities, quality of life, complications and reoperations¹². The quality of life questionnaire was developed by Moorehead Ardelt, of the BAROS protocol. It comprises five domains: self-esteem, physical activities, social relationships, sexual activity and work performance. For each question, there are five answer alternatives, representing a gradual level of satisfaction¹². The item "self-esteem" can go up to 1 (one) point (Much worse = -1; Worse = -0.5; The same = 0; Better = +0.5; Much better = +1). The other items – physical activity, social relationship, work performance and sexual interest – can each go up to 0.5 point (Much less = -0.5; Less = -0.25; The same = 0; More = +0.25; Much more = +0.5). In the analysis of the final score, the results can be classified as "Insufficient", "Moderate", "Good", "Very good" and "Excellent"¹³. The final quality of life assessment results in a numerical value between -3 and +3. Thus, the quality of life is classified as greatly decreased (-3 to -2.25), decreased (-2 to -0.75), unchanged (-0.5 to 0.5), improved (0.75 to 2) and greatly improved (2.25 to 3)¹³.

The women's perception form consists of 19 questions. Questions 1 to 10 are related to the socio-demographic profile, comprising age, civil status, education, occupation, weekly workload, number of children, steady partner, religion, skin color and comorbidities. Questions 11 to 19 investigate the perception of women in relation to sex and the bariatric surgery: how the person feels when talking about sex, sexual frequency, sexual satisfaction after the BS, change in sexual satisfaction, if they would do a BS again and how they perceive their sex life.

Data were analyzed using the SPSS statistical package version 26. Data normality was verified using the Shapiro-Wilk test. The socio-demographic profile and the perception of women were described using absolute frequency (n) and relative frequency (%) for categorical variables, and mean, standard deviation, minimum and maximum for continuous variables. The Spearman correlation test was used to verify the correlation between sexual function and quality of life. In all analysis, the level

of significance was set at 5% ($p < 0.05$).

RESULTS

The study sample consisted of 26 women who underwent bariatric surgery, 19 of which were recruited at a private hospital and 7 by active search. Most are young, married, white, Catholic, with higher education, a workload of more than 36 hours a week, two children, a steady partner and no comorbidities, as shown in Table 1.

Table 1. Characterization of the socio-demographic profile of women (n = 26)

	Mean ± SD	Minimum - Maximum
Age	40.12 ± 9.50 n	19.00 - 54.00 %
Civil status		
Married	17	65.4
Divorced	3	11.5
Single	6	23.1
Level of education		
Elementary school	1	3.8
High school	5	19.2
Higher education	20	76.9
Profession		
Student	3	11.5
Teacher	11	42.3
Healthcare professional	1	3.8
Administrative services	5	19.2
General services	2	7.7
Other	4	15.4
Workload		
20 to 30 hours	5	19.2
36 to 40 hours	9	34.6
44 to 64 hours	6	23.1
Does not apply	6	23.1
Number of children		
0	6	23.1
1	9	34.6
2	11	42.3
Steady partner		
No	4	15.4
Yes	22	84.6
Religion		
Catholic	13	50.0
Spiritist	5	19.2
Evangelical	7	26.9
Umbanda	1	3.8
Skin color		
White	17	65.4
Black	1	3.8
Parda	8	30.8
Comorbidities		
No	14	53.8
Yes	12	46.2

n, absolute frequency; %, relative frequency; SD = standard deviation

The analysis of the perception of women showed that 46% consider themselves comfortable when talking about sex, 42% consider that sexual frequency has increased after the BS, 30% consider that it has decreased, 50% report that sexual satisfaction has improved after surgery, 73% consider that there have been changes in sexual satisfaction, more than 84% would do the BS again, 42% consider their sex life good, 26% consider it great and 23% consider it regular, as shown in Table 2.

Table 2. Characterization of sexual function, quality of life and perception of women (n = 26)

	N	%
BAROS		
Moderate	3	11.5
Good	2	7.7
Very good	10	38.5
Excellent	11	42.3
FSFI		
Dysfunction	10	38.5
Normal	16	61.5
Women's perception Feeling when talking about sex		
Ashamed	1	3.8
Neutral	5	19.2
Comfortable	12	46.2
Very comfortable	8	30.8
Sexual frequency after the surgery		
Increased	11	42.3
Remained the same	7	26.9
Decreased	8	30.8
Sexual satisfaction after the surgery		
Decreased	6	23.1
Remained the same	7	26.9
Improved	13	50.0
Change in sexual satisfaction		
No	7	26.9
Yes	19	73.1

n, absolute frequency; %, relative frequency

Sexual dysfunction had a prevalence of 38.5%, according to the FSFI. Quality of life was considered "excellent" by 42% and "very good" by 38%, according

to the BAROS. These data are shown in Tables 2 and 3. The specification of the scores of each FSFI domain and the mean score of the BAROS questionnaire are presented in Table 3.

Table 3. Descriptive statistics of sexual function and quality of life measured by FSFI and BAROS scores, respectively.

	Mean	Standard Deviation	Median	Minimum	Maximum
BAROS	1.63				
FSFI		1.28	2.00	-1.00	3.00
Desire	3.69	1.50	3.60	1.20	6.00
Arousal	4.10	1.35	4.35	1.50	5.70
Lubrication	4.48	1.51	4.95	1.50	6.00
Orgasm	4.29	1.62	4.40	0.00	6.00
Satisfaction	4.63	1.48	5.20	0.80	6.00
Pain	4.74	1.66	5.40	0.00	6.00
Total	25.93	7.86	28.25	5.00	35.70

There was a correlation between sexual function (FSFI) and quality of life (BAROS) ($r= 0.67, p<0.001$). In addition, not having a sexual dysfunction is associated with a better quality of life ($p=0.001$), as shown in Table 4.

Table 4. Results of the comparison of sexual function with the BAROS score

	FSFI (Mean ± SD)		p*
	Dysfunction (n=10)	Normal (n=16)	
BAROS	0.78 1.29	2.17 0.97	<0.001

*Spearman's correlation test; SD = Standard Deviation

DISCUSSION

According to Cherik et al.¹⁴, Oliveira et al.¹⁵, Sarwer et al.¹⁶, Paul et al.¹⁷, Treacy et al.¹⁸, Janik et al.¹⁹ and Assimakopoulos et al.²⁰, respectively in France, Brazil, North Dakota, Sweden, France, Poland and Greece, the mean age of women who underwent a BS was 39 years, which corroborates the present study, even though one of the studies¹⁹ presents a sample four times larger than this one. The same occurred with marital status and religion, as most women in this study were married and Catholic, as in other studies^{14,15,19,20}.

The women in this study had a higher level of education than in the studies of Oliveira et al.¹⁵ and Sarwer et al.¹⁶, in which, respectively, 33% and 21% of women had only completed high school. It was not possible to compare data regarding profession, workload, steady partner and children, as Cherick et al.¹⁴, Oliveira et al.¹⁵ and Sarwer et al.¹⁶ did not address this data in the description of their results. Regarding skin color, data from Oliveira et al.¹⁵ showed mixed ethnicity, which does not corroborate the present study.

Regarding comorbidities, data from the study by Cherick et al.¹⁴, which analyzed the period from 3 to 6 months after BS, show a higher percentage of arthritis and depression. The study by Oliveira et al.¹⁵, which presents data from 6 months after BS, found that the main comorbidities are hypertension and sleep apnea and the study by Sarwer et al.¹⁶ presented hypertension in its data. In the present study, the comorbidities that had the highest percentage were hypertension and depression, which is in agreement with the studies by Cherick et al.¹⁴ and Sarwer et al.¹⁶.

As for the feelings experienced when talking about sex and if they would do a BS again, it was not possible to compare the results, since Cherick et al.¹⁴, Oliveira et al.¹⁵ e Sarwer et al.¹⁶, Paul et al.¹⁷ and Treacy et al.¹⁸ did not present this data.

Oliveira et al.¹⁵ found a 19.2% improvement in the mean FSFI 6 months after surgery, with an improvement in the overall mean score and changes in the six domains of the questionnaire ($p < 0.05$). It is worth noting that there was an increase in the frequency of 3 of the 12 sex positions evaluated. The sexual health of obese women effectively improves after BS, with favorable changes following weight loss, such as a significant reduction in the prevalence of sexual dysfunction and an increase in the frequency of different sex positions during intercourse, which may be associated with the improvement in sexual frequency in the perception of women in this study.

Additional investigations are necessary to evaluate the effect of body dynamics on the sexual satisfaction of BS patients. Oliveira et al.¹⁵ show that the surgery leads to improvements in self-esteem, body image and sexual satisfaction. Paul et al.¹⁷ did an analysis in the pre-operative period and, later, in the one-year follow-up and noted an improvement in sexual satisfaction ($p=0.001$). In the present study, there was a change in sexual satisfaction after BS, which is in agreement with the studies above.

Comparative studies carried out by Cherick et al.¹⁴, Oliveira et al.¹⁵, Paul et al.¹⁷, and Assimakopoulos et al.²⁰ found significant differences in sexual function before and after surgery. It is worth noting that Cherick et al.¹⁴ demonstrated that the overall mean FSFI score increased to 26 points ($p < 0.005$). In turn, Oliveira et al.¹⁵, in a study with 62 women, found that the same score increased by 19.2% 6 months after surgery, while Paul et al.¹⁷, found that its median score increased to 30.2 after one year. Assimakopoulos et al.²⁰ demonstrated that the total mean FSFI score increased to 25.02 points ($p=0.003$). These data corroborate the analysis of the FSFI in the present study, which demonstrated a perception of improvement in sexual function, with 61% of women with no sexual dysfunction.

In the analysis of each domain of the FSFI, the ones that increased the least after the BS were, according to Oliveira et al.¹⁵, desire, lubrication and arousal.

Sarwer et al.¹⁶ reported persistent improvement in

almost all FSFI domains two years after surgery, except for orgasm and pain. Janik et al.¹⁹ evaluated 153 people 12 to 18 months after BS and found that the domains that increased the least after BS were pain, orgasm and lubrication. Assimakopoulos et al.²⁰ evaluated 59 women and found statistically significant improvement in all FSFI domains, except orgasm. Paul et al.¹⁷ found that all FSFI domains improved one year after surgery, except for lubrication and pain. In this study, 26 women were evaluated and the domains that presented lower scores after the BS were desire, arousal and orgasm, which is in agreement with other studies on the FSFI domains.

In the analysis of quality of life using the BAROS protocol, the present study and the studies by Castanha et al.²¹, Silva et al.²² and Silva et al.²³, which investigated samples with similar mean age, demonstrated an improvement in quality of life, despite being different types of study. Even studies with very different methodologies, such as the one by Sarwer et al.¹⁶, found an improvement in the quality of life. Therefore, bariatric surgery can indeed be associated with an improvement in the quality of life of women who undergo this surgery.

This study had limitations such as the type and size of the sample. It is known that small samples can lead to a type II error. However, the sample was very similar to that of more robust studies and, therefore, we believe that it brought important contributions, such as the prevalence of sexual dysfunction and the association between sexual function and quality of life. There were also limitations related to the type of study itself. Perceptions, quality of life and sexual function were assessed at a single point in the timeline; therefore, comparisons between before and after the surgery were not possible.

CONCLUSION

Most women who underwent bariatric surgery had preserved sexual function, and the domains that had the lowest scores were desire, arousal and orgasm. Sexual dysfunction was present in 38.5% of these women. Quality of life reached scores between excellent and very good. There is an association between quality of life and sexual function. The women felt comfortable talking about sex and mentioned an increase in sexual frequency and satisfaction after surgery. Most women would have the surgery again and consider their sex life to be good or great.

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