

Female Sexual Function after Surgical Treatment of Urinary Incontinence

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Abstract

Introduction: Urinary incontinence is a common problem that can affect the quality of life of women of all ages and can negatively influence the exercise of sexuality. **Aim:** The aim of this study was to compare sexual function of women before and after surgical treatment for urinary incontinence. **Method:** The sample consisted of 38 women with urinary incontinence and surgical treatment (Burch or Sling procedure). The Female Sexual Function Index (FSFI) was used to evaluate sexual dysfunction before and after surgical treatment. **Results:** The mean age of the women in the study was 48 ± 8.8 years, and 58% were 50 years old or younger. By analyzing FSFI, it was observed that the majority of subjects had an overall index of sexual dysfunction (score < 26 points) before surgery. The desire and arousal domains improved significantly after surgery for all women included in the study. It was also observed that women with higher levels of education had more positive results related to desire. **Conclusions:** In our sample, in general, sexual function improved after surgical treatment of urinary incontinence, regardless of technique used, particularly in the discomfort and pain domain. There was a substantial improvement of the sexual function among women who had presented with cystocele. Desire and arousal improved significantly after surgery, very likely due to the improvement of self-esteem after surgery.

Keywords

Female Urinary Incontinence, Sexual Dysfunction, Urogynecology, Surgical

1. Introduction

Urinary incontinence (UI) is a common problem among women of all ages, and its estimated prevalence in different countries ranges from 10% to 30% for women aged 15 to 64 years and 20% to 45% for women past middle age [1] [2] [3]. Although rates vary widely, UI is a common and disturbing problem. In general, half of these women have both stress urinary incontinence (SUI) and urge incontinence.

Studies showed that the risk factors for UI have already been established: number of births, obesity, other urinary symptoms and functional compromise. These factors may change with age [4] [5]. A multicenter, randomized clinical trial evaluated 655 women with UI to compare Burch colposuspension and the sling procedure. Results showed that the sling procedure was more successful [6].

Urinary Incontinence during activities of daily living is source of social embarrassment, sexual dysfunction and low productivity at work. These problems are determinant causes of social isolation, stress, depression, feelings of shame, disability, sexual dysfunction secondary to embarrassment and low self-esteem, which result in significant psychological morbidity [6] [7].

Stress Urinary Incontinence has a negative impact on female sexual life quality, and women complain of pain and incontinence during intercourse [8]. Salonia *et al.* evaluated women with UI and lower urinary tract symptoms and found a high prevalence of sexual dysfunction: 46% of the patients with UI had problems to reach an orgasm, and 47% of the women with low sexual desire reported having SUI. Female UI is often associated with sexual dysfunction (SD), confirmed by low scores in instruments, such as the Female Sexual Function Index (FSFI), used in clinical studies [9].

This study compared the sexual function of women before and after surgery to treat urinary incontinence.

2. Material and Methods

This non-randomized clinical controlled trial evaluated the sexual function of women with urinary incontinence that underwent surgical treatment.

This study was conducted in two referral gynecology centers of South of Brazil (Hospital de Clínicas de Porto Alegre and Santa Casa de Misericórdia de Porto Alegre). After approval by the Ethics in Research Committees, women with urinary incontinence who sought medical care in the urogynecological outpatient departments and underwent surgical treatment was included. Both hospitals provide healthcare to patients in the Brazilian Public Health System. The sample was consecutive. The patients received information about the purposes of the

study, provided written informed consent for participation and publication of the data obtained during the course of the study. They also fulfilled the inclusion criteria: stress or mixed urinary incontinence, age 18 to 80 years, active sexual life and Exclusion criteria: no steady partner, exclusive urge urinary incontinence (UUI), previous vaginal surgery, diagnosis of previous psychiatric disease.

The Female Sexual Function Index (FSFI) instrument was used, and data about family, social and occupational profile of the patients were collected. The FSFI has been translated and validated for use in Portuguese [10]. This instrument underwent psychometric studies, such as reliability, convergence validity and discrimination tests [10]. The FSFI is a written instrument with six subscales and a sum of scores that measures desire, arousal, lubrication, orgasm, satisfaction and pain (dyspareunia). The subscale scores are adjusted and added to calculate the total score, which can range from 2 to 36. The domain scores and the overall scale of FSFI scores are calculated from the sum of individual scores and multiplied by the corresponding factor [10].

The questionnaire was applied during meetings conducted by interviewers trained by one of the authors. The first interview was conducted immediately after the indication of surgery for urinary incontinence, and the second, six months after the surgery during consultation. The surgical indication follows the standard protocol of the urogynecology outpatient Department of the Gynecology and Obstetrics of the Hospitals.

The participants answered a standardized questionnaire about demographic and clinical data.

The sample was consecutively obtained by women with a surgical indication for treatment of urinary incontinence between the years 2009 and 2012, totaling 38 patients.

The SPSS 18.0 was used for statistical analyses. The Student *t* test was used to analyze parametric variables (age, domain scores, total scores). Quantitative variables were described as mean and standard deviation or median and interquartile range. Categorical variables were described as absolute frequencies and relative percentages. The Spearman (r_s) correlation test was used to evaluate the association between quantitative variables. Means were compared using the Student *t* test and, in case of non-normally distributed data, the Mann-Whitney test. Analysis of covariance (ANCOVA) was used to control for confounding variables and square root transformed data due to the asymmetrical distribution of the FSFI scores. The Fisher exact test was used to compare proportions, and the Wilcoxon test, to compare pre- and postoperative scores. The level of significance was set at 5% ($p < 0.05$).

3. Results

The sample comprised 38 women that answered the FSFI questionnaire before operation and six months after the intervention. The participants underwent surgery to treat urinary incontinence: eight underwent Burch colposuspension

and thirty, Sling procedure, according to the surgical indication. In the sling group, mean age was 49.0 ± 8.8 , and women were older and lived longer with their partners (24.3 ± 11.9 years) than in the Burch group. The three women who had a college education were in the sling group. The women in the sling group had a mean BMI (28.4 ± 3.3) that indicated overweight or obesity; 44.8% were menopausal, and 70 had other diseases, such as hypertension and mood disorders. In the same group, partners were older (60 years), stress incontinence affected 33.3% of the women and 76.7% had cystocele. In the Burch group, 75% of the women had more than two children and complained of urinary incontinence symptoms for a longer time (3.3 to 14.5 years). No differences in clinical characteristics between the two groups were statistically significant.

Fifty eight percent were 50 years or younger. Number of schooling years was 7.7 ± 3.2 ; 65.8% women finished elementary school, and only 7.9% had a college degree. More than 50% of their partners were older than 50 (54 ± 11.1) years; couples had been living together for 22.5 ± 11.4 years, and most women had only had one partner. Mean BMI was 28 ± 3.2 , which indicated that patients were overweight; 57.9% had mixed urinary incontinence (MUI) for about 5 years; 34.2% had hypertension; 26.3% were under treatment for mood disorders (depression) and 40.5% were menopausal. Mean number of gestations was three, and most women had more than two children; most women had cystocele (Table 1).

By analyzing FSFI, it was observed that the majority of subjects had an overall index of sexual dysfunction (score < 26 points).

Table 2 compares pre and postoperative FSFI scores in the Burch and sling groups. There were no statistically significant differences before surgery, but there was a 100% increase of discomfort and pain in the Burch group and a 37.5% improvement in the desire domain in the Sling group ($p = 0.028$). Overall postoperative FSFI scores suggested an improvement of sexual function, as the percentage improvement in the Burch group was 35.9%.

Table 3 compares variation FSFI score from before to after surgery in the both

Table 1. Demographic and clinical characteristics.

Characteristic	Total sample	Burch group	Sling group	P
	(n = 38)	(n = 8)	(n = 30)	
	n (%)	n (%)	n (%)	
Age* (years)	48.3 ± 8.8	45.6 ± 10.2	49.0 ± 8.4	0.341 [†]
≤50	22 (57.9)	6 (75.0)	16 (53.3)	
>50	16 (42.1)	2 (25.0)	14 (46.7)	
Education (years)	7.7 ± 3.2	8.3 ± 2.0	7.5 ± 3.4	0.575 [†]
Elementary School	25 (65.8)	6 (75.0)	19 (63.3)	
High School	10 (26.3)	2 (25.0)	8 (26.7)	
College Degree	3 (7.9)	0 (0.0)	3 (10.0)	

Continued

BMI (kg/m ²)*	28.0 ± 3.2	26.7 ± 2.5	28.4 ± 3.3	0.194 [†]
Partner's age* (years)	54.0 ± 11.1	51.8 ± 11.3	54.6 ± 11.2	0.532 [†]
≤50	16 (42.1)	4 (50.0)	12 (40.0)	
>50	22 (57.9)	4 (50.0)	18 (60.0)	
Number of partners*	1.4 ± 0.5	1.6 ± 0.5	1.3 ± 0.5	0.095 [†]
1 partner	24 (63.2)	3 (37.5)	21 (70.0)	
>1 partner	14 (36.8)	5 (62.5)	9 (30.0)	
Years of life in common*	22.5 ± 11.4	16.1 ± 7.2	24.3 ± 11.9	0.075 [†]
UI duration (years)	5 (2 - 10)	5 (3.3 - 14.5)	5 (1.8 - 10)	0.712 ^{†††}
Type of UI				
MUI	22 (57.9)	4 (50.0)	18 (60.0)	0.698 ^{††}
SUI	10 (26.3)	0 (0.0)	10 (33.3)	0.082 ^{††}
Comorbidity				
Hypertension	13 (34.2)	1 (12.5)	12 (40.0)	0.222 ^{††}
Mood disorders	10 (26.3)	1 (12.5)	9 (30.0)	0.653 ^{††}
Menopause	15 (40.5)	2 (25.0)	13 (44.8)	0.431 ^{††}
Number of gestations*	3.3 ± 1.7	2.8 ± 0.9	3.5 ± 1.9	0.307 ^{††}
Number of births*	2.3 ± 1.4	2.0 ± 0.8	2.3 ± 1.5	0.559 ^{††}
<2	10 (26.3)	2 (25.0)	8 (26.7)	
≥2	28 (73.7)	6 (75.0)	22 (73.3)	
Cystocele	29 (76.3)	6 (75.0)	23 (76.7)	1.000 ^{††}
Rectocele	22 (57.9)	5 (62.5)	17 (56.7)	1.000 ^{††}

*mean ± SD; [†]Student *t* test; ^{††}Fisher exact test; ^{†††}Mann-Whitney test; MUI, mixed urinary incontinence; SUI, stress urinary incontinence (SUI).

Table 2. Pre and postoperative FSFI scores in the Burch and sling groups.

Item	Preoperative median (25th - 75th percentile)	Postoperative median (25th - 75th percentile)	Increase %	P*
Total sample				
Desire	2.4 (1.2 - 3.2)	3.6 (2.3 - 3.9)	50.0	0.013
Arousal	2.4 (1.7 - 3.6)	3.3 (2.4 - 4.6)	37.5	0.023
Lubrication	3.5 (2.0 - 5.2)	3.9 (2.3 - 5.4)	11.4	0.083
Orgasm	3.2 (1.2 - 5.2)	4.0 (1.9 - 4.8)	25.0	0.448
Satisfaction	3.8 (2.2 - 4.8)	4.2 (2.4 - 6.0)	10.5	0.094
Discomfort and pain	2.8 (1.6 - 5.2)	4.2 (2.3 - 6.0)	50.0	0.030
Total	17 (11.9 - 24.7)	22.9 (14.3 - 31.1)	34.7	0.012
Burch group (n = 8)				
Desire	2.4 (1.2 - 4.8)	3.6 (3.0 - 3.6)	50.0	0.391
Arousal	2.6 (0.5 - 4.0)	4.1 (3.1 - 4.7)	57.7	0.106
Lubrication	2.9 (0.4 - 5.3)	3.5 (2.2 - 5.6)	20.7	0.123

Continued

Orgasm	4.8 (1.2 - 5.2)	4.6 (3.2 - 5.1)	4.2	0.735
Satisfaction	3.6 (2.0 - 5.0)	4.8 (3.0 - 5.8)	33.3	0.176
Discomfort and pain	2.0 (0.0 - 2.8)	4.0 (2.2 - 4.4)	100	0.028
Total	18.4 (9.2 - 22.7)	25 (17.6 - 28.8)	35.9	0.069
Sling group (n = 30)				
Desire	2.4 (1.2 - 3.0)	3.3 (1.8 - 4.8)	37.5	0.014
Arousal	2.4 (1.7 - 3.6)	3.0 (2.4 - 4.7)	25.0	0.100
Lubrication	3.6 (2.1 - 5.3)	4.1 (2.1 - 5.4)	13.9	0.231
Orgasm	3.0 (1.2 - 5.2)	3.8 (1.2 - 4.8)	26.7	0.379
Satisfaction	3.8 (2.1 - 4.8)	4.0 (2.4 - 6.0)	5.3	0.301
Discomfort and pain	3.4 (1.6 - 5.7)	4.8 (2.2 - 6.0)	41.2	0.164
Total	16.4 (11.9 - 27)	22.2 (11.6 - 31.7)	35.4	0.063

*Wilcoxon test.

Table 3. FSFI score variation from before to after surgery.

Item	Burch group (n = 8) median (25th - 75th percentile)	Sling group (n = 30) median (25th - 75th percentile)	p*	P _{adjusted} **
Desire	1.2 (-1.4 to 2.3)	0.6 (0.0 to 1.4)	0.739	0.499
Arousal	1.2 (0.0 to 4.0)	0.5 (-0.9 to 1.8)	0.332	0.060
Lubrication	0.3 (0.1 to 0.6)	0.3 (-0.4 to 1.0)	0.930	0.981
Orgasm	0.2 (-2.2 to 3.4)	0.4 (-0.8 to 1.7)	0.820	0.448
Satisfaction	1.2 (0.4 to 2.8)	0.0 (0.0 to 1.8)	0.332	0.124
Discomfort and pain	1.2 (0.4 to 2.8)	0.0 (0.0 to 1.8)	0.138	0.495
Total	8.5 (-0.6 to 10.1)	3.6 (-2.1 to 8.3)	0.314	0.504

⊗: differences between pre- and postoperative scores. Positive values indicate improvement in sexual function, and negative values, deterioration. FSFI, Female Sexual Function Index. *Mann-Whitney test; **Analysis of covariance (ANCOVA) adjusted for BMI. Number of partners, time of life in common and SUI according to square-root transformed scores.

groups (Sling and Burch). All patients had already had sexual intercourse after surgery when the second questionnaire was applied. Only the lubrication domain showed no variation. Sling group had a smaller variation in the overall score.

There was a direct significant association between education and sexual function improvement in the desire domain ($p = 0.04$); that is, women with a higher level of education had greater improvement of their sexual function in the desire domain than women with less education. A direct significant association was found between education and sexual function in the desire domain; that is, desire increased with the level of education (**Figure 1**). On the other hand, a negative effect on desire was found in women with older partners ($p = 0.04$) (**Figure 2**).

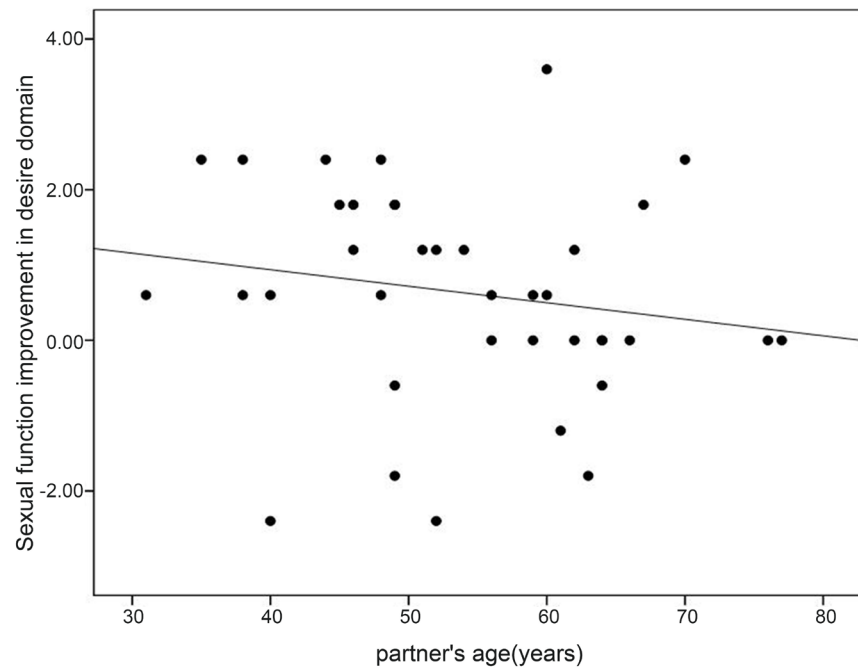


Figure 1. Association of partner's age and sexual function improvement in the desire domain. There was an inverse significant association between partner's age and sexual function improvement in the desire domain ($r_s = -0.330$; $p = 0.043$), that is, women with older partners had less improvement of their sexual function in the desire domain than women with younger partners.

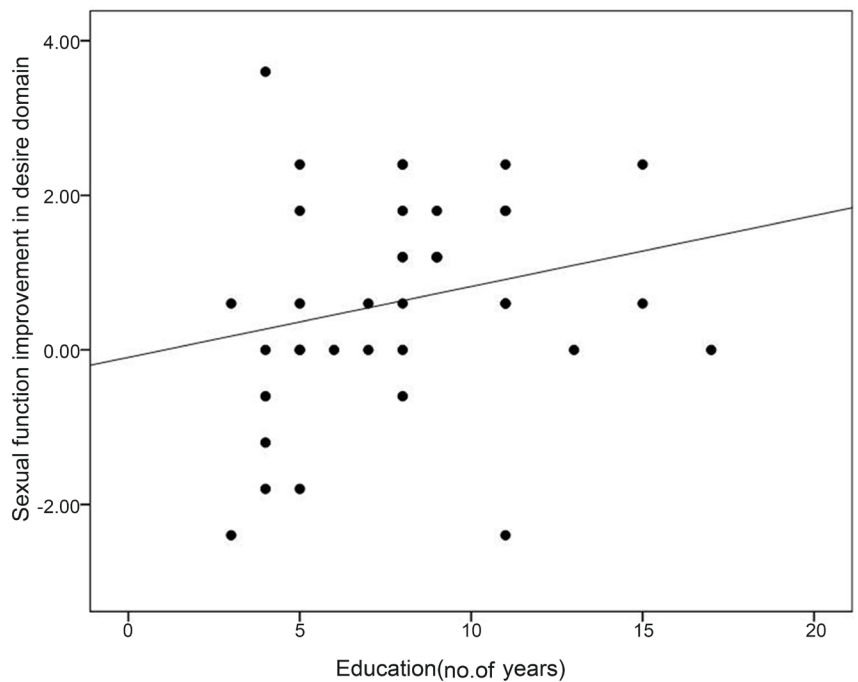


Figure 2. Association of education and sexual function improvement in the desire domain. There was a direct significant association between education and sexual function improvement in the desire domain ($r_s = 0.330$; $p = 0.043$), that is, women with a higher level of education had greater improvement of their sexual function in the desire domain than women with less education.

The comparison of sexual function in the discomfort and pain domain revealed that results were significantly higher among women with anterior vaginal prolapse (AVP). Women with AVP, which was corrected, had a significantly improvement in sexual function in the discomfort and pain domain postoperative than women without AVP. In this article, we use the term “cystocele repair” to represent these cases.

4. Discussion

The overall prevalence of urinary incontinence varies depending on the country, type of study, age and definition of IU. Several procedures use a type of sling and different approaches, types of material and tension range. The use of synthetic materials (polypropylene slings), often used today, has a short-term objective benefit of 73% to 93% [11].

Sexuality is an integral part of human expressions. Pelvic floor symptoms are common and are negatively associated with sexual function which, in turn, is an important aspect of quality of life [12]. Sexual dysfunctions are highly prevalent among women. In the United States, about 40% of all women have a sexual problem of any type, and 12% have a distressing sexual problem [13]. Female sexual dysfunction (FSD) has different presentations and includes the loss of sexual desire, deficient arousal, inability to reach orgasm or pain during intercourse. FSD may be a life-long problem or a condition acquired after a period of normal sexual life.

The main predictors of sexual satisfaction are mental and physical health and quality of the relationship with the partner. Therefore, treatment should include interventions that may optimize health, wellbeing and spousal relations. Studies with women in general found consistent and prevalent patterns associated with desire, followed by problems with orgasm, arousal and dyspareunia.

Several studies found that symptoms associated with sexual dysfunction, such as dyspareunia, vaginal dryness and incontinence during sexual intercourse, are reported by up to two thirds of women with UI, and 68% of them experience changes in their sexual lives due to urinary symptoms [14].

Another study compared women with UI and the normal population and found that, of the 216 women included in the analysis, 99 had sexual dysfunctions. The women in the normal population had no urinary complaints [9]. Aslan evaluated 21 premenopausal women with UI and found that this disorder significantly reduces the sexual function of sexually active women [15]. In addition, women with UI, according to Sen, had more significant sexual dysfunction than women in the control group [16].

The FSFI is the scale most often used in the literature to assess female sexual function. Higher scores indicate a better degree of sexual function [10]. Several studies have used the FSFI to assess risk factors of FSD, but their main study outcome was total score, and not the scores for each domain [16]. The FSFI has also been validated and used to evaluate sexual function in several diseases [15].

In Turkey, Sen *et al.* compared the FSFI score of 153 women with UI (mean age, 46 years) and 89 controls (mean age, 45 years). The scores for all FSFI domains were significantly lower in women with UI, and SUI (MUI) had a significant impact on their sexual function when compared with other types of incontinence [16]. The low FSFI scores among women with SUI may be explained by the fear of incontinence during intercourse. Leakage during penetration is associated with SUI, and leakage during orgasm is associated with SUI and a hyperactive detrusor muscle and mixed urinary incontinence (MUI). Mean age of the women with SUI was higher. This result was also observed in our study.

In this study, the orgasm domain had no significant differences when type of surgery was compared. However, Salonia *et al.* evaluated women with UI and lower urinary tract symptoms and found a high prevalence of SD: 46% of the patients with UI had problems to reach an orgasm, and 47% of the women with a low sexual desire reported SUI [9].

Sexual satisfaction seems to be independent from UI or prolapse treatment, but, according to Roovers *et al.*, prolapse is a factor that contributes to dysfunction and, when surgically repaired, may improve sexual function. In their study, 68% of the women with prolapse had sexual problems before surgery [17]. According to Fashokun *et al.*, rates of sexual activity and function are not different between women with and without pelvic floor disorders [18]. We found that women with cystocele had a significantly greater improvement in the discomfort and pain domain of the FSFI after surgery, which is in agreement with the results reported by Roovers *et al.* We believe that self-esteem improves after cystocele repair.

A prospective observational study with 29 women using the validated FSFI found no changes in general sexual function after the sling procedure [19]. Another retrospective study using a non-validated questionnaire developed specifically for that study did not find any change in sexual function in 72% of all women after sling surgery, but there was a deterioration in 14% of them, with loss of libido as the main reason for sexual dysfunction [20]. A cross-sectional study included 52 women whose mean age was 60 years and who were followed up for 1.5 years after surgery using the sling technique; 40% of the women were sexually active. One third reported that their sexual function improved after surgery; for 14%, there was some deterioration, and for 52%, no change. In our study, there was a percentage improvement (50% and 37.5%) in the FSFI desire and arousal domains, as well as in total score, after surgery in both groups. Women with SUI were older than women in the other groups [21]. When the FSFI results were analyzed according to symptoms, scores were significantly lower in cases of SUI. In the SUI group, there was a significant association between the desire, arousal and lubrication domains [21]. In the sling group, 100% of the patients had SUI, only the desire domain had an increase (37.5%) in the comparison before and after surgery.

Shah *et al.* did not find any sexual dysfunction in a series of 29 patients that

underwent surgery using a polypropylene sling to treat SUI [22]. In a recent study, Lowenstein *et al.* demonstrated a decrease in vaginal sensitivity after trans-obturator tape, due to a probable damage to the innervation of the anterior vaginal wall. However, there are no studies to show if there is any impairment in the sexual function of the women submitted to this procedure [23].

Our study found a percentage increase (improvement) in the discomfort and pain domain in the two groups. Although this result was not significant, it is clinically relevant because it may lead to SD. Similar results were found by Tancer *et al.*, in whom urinary incontinence correction procedures did not interfere directly with sexual function, but rather with the quality of life of these women [24].

This study has also limitations that must be taken account when analyzing results, because this is a non-randomized clinical study. One hypothesis is that increasing the sample size, there was a statistically significant overall result in improved sexual function.

5. Conclusions

In fact, we can see that there was no statistically significant improvement in overall sexual function; but when assessing individual domains, we can see an improvement of discomfort and pain during sexual intercourse despite of technique used. The sexual function among women with corrected cystocele improved substantially. Desire and arousal improved significantly after surgery, due to the improvement of self-esteem after surgery.

Thus, we can conclude that sexual function is multifactorial. Women who undergo surgical treatment for UI should have their sexual function included in the investigation, treatment and follow up. Health professionals must be prepared to deal with sexual dysfunctions, consequently, improving the quality of life of patients.

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Contributor Statement

Eliane Goldberg Rabin, Janete Vettorazzi, Fernanda Santos Grossi, José Geraldo Lopes Ramos conceived/designed the study and worked on data collection. Bruno Ribeiro Bossardi and Bruno Florentino Goldani worked on data collection. Eliane Goldberg Rabin, Fernanda Santos Grossi and Janete Vettorazzi carried out the initial analyses, drafted the initial manuscript, and critically reviewed and revised the manuscript. All authors read and approved the final

manuscript as submitted.

Conflicts of Interest

The authors have no conflicts of interest to disclose.

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