



Resolution of Female Sexual Dysfunction (FSD) Among the Obese Multiethnic Malaysian Women Now a Reality with Bariatric Surgery: a Prospective Pilot Study in Malaysia

Sivaneswaran Lechmiannandan¹  · Mayurran Panirselvam² · Prema Muninathan³ · Narwani Hussin³ · Reynu Rajan² · Hatta Sidi⁴ · Nik Ritza Kosai² · C. Rajkumar Vinayak⁵

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Abstract

Introduction Female sexual dysfunction (FSD) among the obese women is often under diagnosed and ignored especially in Malaysia, a nation of conservative multiethnic society. There are only a few studies on FSD resolution post-bariatric surgery. The objective was to identify the rate and resolution or improvement of FSD, among obese multiethnic Malaysian women post-bariatric surgery.

Material and Methods This is a prospective study of women undergoing bariatric surgery, between May 2017 and April 2018. FSD was diagnosed using the Malay version of Female Sexual Function Index (MVFSFI) questionnaire. Patients filled up the questionnaire before and 6 months after surgery. Association between BMI reduction and FSFI score improvement was measured using Fisher's exact test. Outcomes between types of surgery (sleeve gastrectomy and gastric bypass) was compared.

Results Fifty-two women completed the study. The mean age was 38.77 ± 6.7 . There were 44 (84.6%) Malay patients, 7 (13.5%) Indian patients, and 1 (1.9%) Chinese patient. There was a significant reduction in mean BMI, 39.89 ± 6.9 pre-surgery to 30.32 ± 5.4 post-surgery (p value < 0.001). The rate of FSD among the obese is 75.0% pre-surgery compared to 36.0% post-surgery. There was a significant improvement in mean FSFI score pre- and post-surgery: 18.73 and 25.93 respectively and in each of all 6 domains (p value < 0.001). There was a significant association between BMI reduction and improvement in FSFI score ($p = 0.019$). There was no difference in outcomes between types of surgery.

Conclusion FSD is highly prevalent among the obese multiethnic Malaysian women. Bariatric surgery has proven benefit in resolving FSD across all sexual domains and should be considered as a management option in this group of women.

Keywords Sexual dysfunction · Women · Female · Bariatric surgery · Female sexual function index · Malay version female sexual function index

✉ Sivaneswaran Lechmiannandan
smartsiv@hotmail.com

¹ Department of Urology, Hospital Pulau Pinang, Jalan Resideni, 10990 Georgetown, Penang, Malaysia

² Minimally Invasive, Upper Gastrointestinal and Bariatric Surgery Unit, Department of Surgery, Faculty of Medicine, Pusat Perubatan Universiti Kebangsaan Malaysia, Cheras, 56000 Kuala Lumpur, Malaysia

³ Clinical Research Centre, Hospital Taiping, Jalan Taming Sari, 34000 Taiping, Perak, Malaysia

⁴ Department of Psychiatry, Faculty of Medicine, Pusat Perubatan Universiti Kebangsaan Malaysia, Cheras, 56000 Kuala Lumpur, Malaysia

⁵ Bariatric Surgery Unit, Department of Surgery, Hospital Taiping, Jalan Taming Sari, 34000 Taiping, Perak, Malaysia

Introduction

Female sexual dysfunction (FSD) is a multifactorial sexual health problem that affects a substantial number of women worldwide, yet data on its prevalence are scant, even among European nations [1]. The presence of obesity among them complicates the condition further.

In a descriptive study at the Professor Alberto Antunes University Hospital, Brazil, the prevalence of FSD was 78.3% in women who are obese and overweight [2].

In Malaysia, a nation with conservative multiethnic society, FSD is under diagnosed and often ignored as sexual matters are not openly talked about. The matters are made worse when these women are overweight or obese, leading to majority of them suffering from lower self-esteem, hormonal imbalance,

lack of sexual drive, and infertility [3]. Though weight loss programs have benefited these groups of women, lack of motivation has resulted in poor compliance to complete them.

Bariatric surgery, a minimally invasive surgical procedure performed to induce weight loss by reducing the size of the stomach with a gastric band or through removal of a portion of the stomach (sleeve gastrectomy or biliopancreatic diversion with duodenal switch) or by resecting and re-routing the small intestine to a small stomach pouch (gastric bypass surgery) [4–7], has gained value over the last decade for its proven benefit in not only weight loss but resolution of metabolic syndrome and its associated conditions such as cardiovascular disease and osteoarthritis of the knee [8, 9].

In a study by Bond et al., 54 sexually active women who underwent bariatric surgery completed the widely accepted Female Sexual Function Index (FSFI) questionnaire which is used to diagnose FSD. Upon comparing their pre-operative and post-operative scores, 34 of them were diagnosed to have FSD before surgery with 68% of them achieving resolution 6 months later [10]. However, Janik et al., in their cross-sectional study and literature review of female sexual function before and after bariatric surgery, had contradicting results with no difference in the prevalence of FSD between groups. Though the median scores in FSFI domains of desire and arousal were significantly higher in the post-operative group, there were no differences in the other FSFI domains [11]. Thus, more studies are required to explore and verify the role of bariatric surgery in resolving FSD among obese women. To our knowledge, the population in all these studies involved only the westerners, with none involving the Asian population.

We thus embarked on this study to determine the rate of FSD and potential resolution or improvement of the condition, among morbidly obese multiethnic Malaysian women undergoing bariatric surgery.

Material and Methods

This prospective study was conducted in two bariatric centers in Malaysia, i.e., the University Kebangsaan Malaysia Medical Centre (UKMMC) in Cheras, Kuala Lumpur, and the Hospital Taiping in the state of Perak. All females undergoing bariatric surgery were screened for FSD and subsequently recruited for this study after obtaining written consent from them and ethics approval from the respective research centers, i.e., the Research Ethics Committee Universiti Kebangsaan Malaysia (RECUKM) and the Ministry of Health Medical Research Ethics Committee (MREC) of Malaysia. Based on previous studies that showed no difference in sexual function improvement with different types of bariatric surgery, female patients aged more than 18 years with no neurological or psychiatric disorder, undergoing bariatric surgery for indications based on

the International Federation for the Surgery of Obesity and Metabolic Disorders–Asia Pacific Chapter (IFSO-APC) [12] between 1 May 2017 and 30 April 2018 (1 year), were recruited into this study. Patients who are sexually active, i.e., having sex at least once a month were included. Patients with history of gynecological malignancy, hysterectomy, bilateral oophorectomy, hysterectomy with bilateral oophorectomy, or patients diagnosed with primary or secondary hypogonadism were excluded from the study. However, all patients diagnosed with FSD were advised to seek professional help regardless of inclusion into this study.

FSD was diagnosed using the Female Sexual Function Index (FSFI) questionnaire. It is a 19-item questionnaire that was designed by Rosen et al. that assesses level of sexual functioning during the past month across 6 domains: (1) sexual desire (assessed as frequency and desire level), (2) sexual arousal (assessed as frequency, level, confidence, and satisfaction), (3) lubrication (assessed as frequency, difficulty, frequency of maintaining, and difficulty in maintaining), (4) orgasm (frequency, difficulty, and satisfaction), (5) sexual satisfaction (assessed as the amount of closeness with partner, sexual relationship, and overall sex life), and (6) sexual pain (assessed as pain frequency during vaginal penetration and pain frequency following vaginal penetration) [13]. The FSFI provides scores for each domain as well as a total score, with higher scores indicating better sexual function (sexual desire, 1.2–6; sexual satisfaction, 0.8–6; sexual arousal, lubrication, orgasm, and sexual pain, 0–6; total, 2–36). The FSFI is shown to have psychometric and clinical validity as well as high test-retest reliability for each of the individual domains. We used the validated FSFI total cutoff score of 26.55 to classify women with and without FSD [14]. As there were significant number of Malay-speaking patients who could not comprehend the FSFI, the validated Malay version of FSFI (MVFSFI) by Hatta et al. was used as it is a validated and locally accepted questionnaire for use in the assessment of FSD in the Malaysian population [15].

Eligible patients who consented to join the study were given the questionnaire during their pre-operative bariatric clinic. Patients were reassessed after 6 months of surgery during their follow-up clinic as significant weight loss and improvement of health-related quality of life is seen within the first 6 months after surgery [16]. They were blinded to the initial questionnaire that was filled up to avoid recall bias. Patients who did not understand the questions had them clarified by female doctors proficient in English and Malay languages. WHO BMI Classification for Asians was used to determine the BMI category for the study patients [17].

We used Power and Sample Size Calculator, DuPont and Plummer, 1997, to calculate the sample size. To achieve 90% power and alpha of 0.05, we needed at least 44 patients to detect the difference of 1.0 unit in mean FSFI score with SD of 2.0 [10]. Anticipating 20% dropouts, we finally recruited 52 patients.

Statistical analyses were conducted using the Statistical Package for Social Sciences, version 20.0. Normally distributed continuous variables were described as mean ± standard deviation. The paired *t* test was used to assess the differences in patients’ mean of their FSFI’s scores. Categorical variables were described using frequency distributions and are presented as frequency (%). Categorical variables were compared using the chi-square, or Fisher’s exact test as necessary. All tests are two-tailed and considered significant at *p* < 0.05.

Results

The demographic data of patients are presented in Table 1. The mean age was 38.77 ± 6.7. Based on ethnicity, there were 44 (84.6%) Malay patients, 7 (13.5%) Indian patients, and 1 (1.9%) Chinese patient.

The mean BMI pre- and post-surgery was 39.89 ± 6.9 and 30.32 ± 5.4 respectively. The reduction of BMI 6 months post-surgery was statistically significant (*t* = 23.23, *p* < 0.001). The Asian BMI classification categories pre- and post-surgery are presented in Table 2.

Sexual Function and FSFI Score

The prevalence of female sexual dysfunction (FSD) among the obese patients at pre-surgery compared to post-surgery is 75.0% and 36.0% respectively. The mean FSFI total score at pre- and post-surgery was 18.73 ± 9.7 and 25.93 ± 7.5 respectively.

The improvement in the score was statistically significant (*p* < 0.001). There was also a statistically significant improvement in each of the 6 domains of the FSFI score (*p* < 0.001). The mean scores are listed on Table 3.

The Fisher’s exact test was used to study the association between BMI (kg/m²) and presence of FSD post-surgery. The analysis shows there is a significant association between BMI reduction and improvement in FSFI score with (Fisher’s exact test; *p* = 0.019 (Table 4).

Further analyses comparing the type of surgery (sleeve and bypass) with BMI reduction and FSD resolution post-surgery was conducted using the independent *t* test and Pearson chi-

Table 1 Demographic data of patients

Demographic, <i>n</i> = 52	
Age (years), mean ± SD	38.77 ± 6.7
Ethnicity, <i>f</i> (%)	
Malay	44 (84.6)
Chinese	1 (1.9)
Indian	7 (13.5)

Table 2 BMI category pre- and post-surgery (BMI, body mass index)

BMI category	Pre-surgery, <i>f</i> (%)	Post-surgery, <i>f</i> (%)
Normal	0	3 (5.8)
Overweight	0	4 (7.7)
Pre-obese	0	23 (44.2)
Obese I	32 (61.5)	20 (38.5)
Obese II	17 (32.7)	2 (3.8)
Obese III	3 (5.8)	0

square test respectively. However, there was no significant difference between type of surgery and BMI post-surgery with *p* = 0.293. Similarly, there was no significant difference in FSD resolution between the two groups with *p* = 0.773.

Discussion

FSD among patients with obesity is not uncommon. FSD is a multifaceted condition that results in significant interpersonal distress with significant unfavorable health and medical outcome. Though the theme of sexuality is considered a taboo in many cultures, the topic is well-accepted in the local Malaysian population [15].

The core mechanism of obesity-related FSD is complex with a biopsychosocial perspective. There are high number of co-morbidities among the morbidly obese patients, i.e., diabetes mellitus, hypertension, dyslipidemia, and low quality of life (QoL) besides which, a strong correlation with sexual dysfunction [18]. Psychological and social sequelae of obesity may influence self-esteem and difficulties in initiating and maintaining sexual relations [18]. Studies have shown that weight reduction positively regulates sexual function in the obese population, especially in women [10]. These achievable strategies are probably due to amelioration of medical, surgical, and psychosocial disadvantages.

Table 3 Female Sexual Function Index (FSFI) domain scores pre- and post-surgery

Domain	Pre-surgery	Post-surgery	<i>p</i> value
Desire	2.7 ± 0.8	3.61 ± 0.9	<i>t</i> = - 5.37, < 0.001*
Arousal	2.68 ± 1.5	3.9 ± 1.2	<i>t</i> = - 4.72, < 0.001*
Lubrication	3.20 ± 1.9	4.49 ± 1.4	<i>t</i> = - 4.23, < 0.001*
Orgasm	3.15 ± 1.9	4.38 ± 1.4	<i>t</i> = - 4.02, < 0.001*
Satisfaction	3.26 ± 1.8	4.62 ± 1.5	<i>t</i> = - 4.63, < 0.001*
Pain	3.71 ± 2.2	4.82 ± 1.6	<i>t</i> = - 2.67, < 0.001*
Total score	18.73 ± 9.7	25.93 ± 7.5	<i>t</i> = - 4.51, < 0.001*

*Paired *t* test

Table 4 FSFI improvement with BMI reduction

BMI post-surgery	Sexual dysfunction		<i>p</i> value
	Yes, frequency (%)	No, frequency (%)	
Normal	1 (33.3)	2 (66.7)	0.019*
Overweight	1 (25.0)	3 (75.0)	
Pre-obese	4 (17.4)	19 (82.6)	
Obese I	11 (55.0)	9 (45.0)	
Obese II	2 (100.0)	0 (0.0)	

*Fisher's exact test

In our study population, FSD was prevalent as reflected by the average test scores which were lower than the established cutoff scores, i.e., ≤ 26.55 based on the MVFSFI. As anticipated, noteworthy weight loss was documented for our cohort and was comparable to that stated in the literature. In our study, significant resolution of FSD was observed for all as reflected by the FSFI domains, i.e., improvement in the sexual desire, lubrication, sexual arousal, orgasm, sexual satisfaction, and sexual pain among our cohort. Since the primary mechanism of obesity-related FSD is multifactorial, the extent to which different variables accounted for sexual function improvement may differ between the study centers. Thus, impaired hormonal regulation may contribute to FSD [19]. The improvements in sexual functioning among our cohort are possibly due to bio-psycho-social benefit of hormonal balance, the body image, and increased self-esteem.

Results from our study are comparable with other research studies. Camps and colleagues had retrospectively researched 28 patients (64% women) subjected to the vertical banded gastroplasty 1–11 years earlier. They found that 50% of patients and 64% of their partners reported better sexual relations, including enhancements in the frequency and satisfaction of sexual intercourse, orgasmic capabilities, and body image [20]. Kolotkin et al. found modifications in the sexual relation and QoL over a 2-year period in 187 adults (161 women and 26 men) subjected to weight loss treatment. Weight reduction greatly enhanced their sexual satisfaction and QoL [21]. Bond and team reported on a cohort of 54 women who underwent bariatric surgery, 34 of whom suffered from sexual dysfunction. Similar to our study, they completed the FSFI preoperatively and 6 months post-operatively. Sexual dysfunction resolved in 68% of these 34 women [10].

Interestingly, the influence of weight reduction on hormonal balance has been shown in women as well in men, but its effect to the female sexual functioning is to a lesser degree noticeable. In comparison, the role of psychological factors, such as body image and stress level, the former has been studied in women more frequently but, unfortunately, its effect on sexual function is still not clearly understood [22–24].

Limitations of our study include non-random sampling technique and, secondly, the inclusion of a relatively low

sample size for our bariatric respondents. This might present a potential type-I error but arguably, the results from the psychometric scale on our studied respondents are almost similar with other studies, according to the age and the study design. The strength of our study is the utilization of a validated questionnaire such as the MVFSFI which is culturally widely accepted by Malaysians to assess the female sexual function.

Although further researches may be required to answer the exact mechanism of the resolution of FSD, we conclude that bariatric surgery has a consequential positive effect and benefit on female sexual function, yet adding another reason on the intervention modality for morbid obesity.

Conclusions

FSD is common among morbidly obese women. Besides concomitant medical co-morbidities and adverse effect, obesity may impair their quality of life and harmonious relationship between herself and their partner. Bariatric surgery is an acceptable treatment for FSD in morbidly obese women, as it is currently the optimal management strategy to treat this medical condition.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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