

ONCOLOGY

Sexual Dysfunction Among Women With Breast Cancer in the Northeastern Part of West Malaysia



Poh Siang Ooi, MD,¹ Nani Draman, MMED,¹ Rosediani Muhamad, PhD,¹ Siti Suhaila Mohd Yusoff, MMED,¹ Norhayati Mohd Noor, PhD,¹ Juhara Haron, MMED,² and Imi Sairi Ab Hadi, MMED³

ABSTRACT

Introduction: Female sexual dysfunction (FSD) is a common complication among breast cancer patients following treatment.

Aim: To assess the prevalence and factors associated with FSD among breast cancer patients in Kelantan.

Methods: This cross-sectional study recruited female patients, aged 18–65, who were married and sexually active with their partner, diagnosed with breast cancer, and had undergone breast surgery. Those with underlying psychiatry disorders, previous pelvic surgery, and husbands with sexual problems were excluded. The questionnaire contained demographic and clinical information, together with the Malay Version of the Breast Impact of Treatment Scale and the Malay Version of Female Sexual Distress Scale-Revised. Their sexual function was evaluated using the Malay Version of the Female Sexual Function Index-6. The data were analyzed with simple and multiple linear regressions.

Main Outcome Measures: The prevalence and associated factors for FSD in breast cancer patients.

Results: Ninety-four eligible patients were recruited for this study. In total, 73.4% (n = 69) of the patients reported having sexual dysfunction. A family history of breast cancer ($P = 0.040$), duration of marriage ($P = 0.046$), and frequency of sexual intercourse ($P = 0.002$) were significant factors associated with FSD in breast cancer patients after surgery.

Conclusion: The significant associated factors shown to influence the FSD score include family history of breast cancer, duration of marriage, and frequency of sexual intercourse. About 73.4% of patients have risk of developing FSD after receiving breast cancer treatment. **Siang OP, Draman N, Muhamad R, et al. Sexual Dysfunction Among Women With Breast Cancer in the Northeastern Part of West Malaysia. Sex Med 2021;9:100351.**

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Key Words: Breast Cancer; Female Sexual Dysfunction; Breast Impact of Treatment Scale; Female Sexual Function Index-6

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¹Department of Family Medicine, School of Medical Sciences, Health Campus, Universiti Sains Malaysia Kubang Kerian, Kelantan, Malaysia;

²Breast Cancer Awareness and Research Unit, Hospital Universiti Sains Malaysia, Jalan Raja Perempuan Zainab II, Kubang Kerian, Kelantan, Malaysia;

³Department of Surgery, Hospital Raja Perempuan Zainab II, Jalan Hospital, Kota Bharu, Kelantan, Malaysia

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INTRODUCTION

Breast cancer is the second most common type of cancer worldwide. There were 1.67 million new breast cancer cases diagnosed in 2012 among women, making it the most frequent type of cancer among women. Breast cancer ranks as the fifth leading cause of overall cancer death.¹ Breast cancer is the most common type of cancer in Malaysia. Almost one-third of female patients with cancer have breast cancer, with 18,206 total cases reported from 2007 to 2011. The number of new cases diagnosed increases every year. Breast cancer is the most common type of cancer in female patients aged 25–74 years old.²

Local statistics indicate that half of breast cancer patients are diagnosed before the age of 50.³ This group of patients has significantly better survival compared with women diagnosed at age

50 and older.⁴ Despite having a better survival and longer life-span ahead, younger women are at risk of living with sexual dysfunctions following their breast cancer diagnosis and treatment. Worldwide studies have reported that 31.6%–91.2% of breast cancer patients develop female sexual dysfunction (FSD) post-treatment.^{5–11} Breast cancer patients face many difficult tasks along the way to restoring their sexual health after undergoing breast cancer treatment, including surgery.⁵

Almost all breast cancer patients in Malaysia reported having FSD.¹⁰ However, a qualitative study by Jaafar¹² exploring the problems associated with breast cancer revealed that all participants denied having any sexual problems. Most of these participants were middle-aged women, and three-quarters had stage 1 to 3 breast cancer. This result is suspicious because many studies related to FSD among the general population and even those with chronic diseases other than cancer in Kelantan, Malaysia have reported an FSD prevalence of nearly 30%.^{13–15} These local studies also found that four main demographic and marital factors are closely linked to FSD, including age, frequency of sexual intercourse, duration of marriage, and marital satisfaction.

Younger age was shown to be highly associated with FSD among patients who had undergone operations and completed adjuvant treatment for breast cancer.⁶ However, studies in Iran and Brazil showed the opposite findings in which increasing age resulted in lower sexual function.^{16,17} Treatments related to breast cancer including surgery, chemotherapy, radiotherapy, and hormonal therapy are cited as reasons why patients develop sexual dysfunction.^{18,19} Patients who experience premature menopause after undergoing breast cancer treatment also pose a greater risk for sexual morbidity.^{5,20}

Surviving breast cancer but living with sexual dysfunction can result in further distress and relationship difficulties. The sexual dysfunction itself may disrupt relationship intimacy, contribute to emotional distress, reinforce negative body image, or become a constant reminder of a patient's cancer history.²¹ However, many doctors and patients are hesitant to discuss this sexual issue for several reasons, including seeing it as a social barrier and traditional beliefs that open discussion about sex is a taboo.^{22,23}

Identifying local breast cancer patients who are at a higher risk of experiencing sexual dysfunction is essential so that prompt intervention can be provided to improve their sexual function and overall wellbeing in the latter part of their life. Thus, the aims of this study were to determine the prevalence of FSD among breast cancer patients and the associated factors for FSD among them.

MATERIALS AND METHODS

This cross-sectional study was conducted at the Breast Cancer Awareness & Research Unit and oncology clinic of the tertiary hospital, from November 2018 until July 2019. This study has ethics committee approval from the university and national level.

Population and Sample

The study population consisted of female patients aged 18 to 65 years old who were diagnosed with breast cancer and underwent breast cancer surgery, were married and sexually active with their partner, and were physically fit. The exclusion criteria were participants with psychiatric disorders such as depression, anxiety, and schizophrenia; those who were unable to understand Bahasa Malaysia; those with a husband who was known to have any sexual problems such as erectile dysfunction and premature ejaculation; and those with a previous history of pelvic surgery excluding cesarean section. The sample size to identify the associated factors for FSD among breast cancer patients was determined by comparing two proportions for categorical variables and comparing two means for numerical variables, using an α of 0.05 and a power of 0.8. The proportion of breast cancer survivors who underwent endocrine therapy among non-FSD patients, P_0 , was 0.31.¹⁹ A P_1 of 0.63 was used. After considering a drop-out rate of 30%, the estimated sample size was 96 patients.

Research Tools

The questionnaire used in this study consisted of four parts. The first part focused on the biodata of the participants and included sociodemographic characteristics, marital profile, and clinical history; this information was obtained via interviews and reviewing the medical records of the patients. The second part was the Malay Version of the Breast Impact of Treatment Scale (MVBITS). The original English version of the Breast Impact of Treatment Scale assesses body image distress for female breast cancer patients following the traumatic stressor of breast cancer and breast surgery.²⁴ The MVBITS was validated among 70 female breast cancer survivors who underwent chemotherapy at the Oncology Clinic of the University Malaya Medical Centre, Kuala Lumpur, Malaysia.²⁵ The internal consistency reliability of the MVBITS was good with a Cronbach's alpha of 0.945 and showed temporal stability over a three-week period. The principle component analysis suggested the presence of two domains: the 'Intrusion' and 'Avoidance' domains. The MVBITS contains 13 items, and each is weighted on a four-point scale (0 = not at all, 1 = rarely, 3 = sometimes, and 5 = often), which covers the domains of body image, sexual behavior, sexual affects, and cancer-related traumatic stress. The 13 items are summed for a total score ranging from 0 to 65, with higher scores indicating greater body change stress.

The third part is the Malay Version of the Female Sexual Distress Scale-Revised (MVFSDS-R). The initial Female Sexual Distress Scale was designed to measure sexually related personal distress in women.²⁶ The Female Sexual Distress Scale-Revised (FSDS-R) was then developed to enhance the sensitivity of the original Female Sexual Distress Scale (FSDS) for patients suffering from hypoactive sexual desire disorder (HSDD). The validation showed good discriminant validity, high test-retest reliability, and a high degree of inter-rater consistency in measuring sexually related personal distress

in women with HSDD.²⁷ It contains 13 items, and each item is scored from 0 to 4. A total score of ≥ 11 indicates that the woman has female sexual distress.

The FSDS-R was translated to Malay language by two bilingual persons. The MVFSDS-R content and comprehensiveness were validated by Family Medicine Specialists and bilingual English teachers. MVFSDS-R then was given to 10 breast cancer patients from Hospital Raja Perempuan Zainab II, Kota Bharu Kelantan (HRPZII) for face validity. Testing of the construct validity and reliability was performed among 128 breast cancer patients in the oncology clinic at HRPZII. None of the items were eliminated. The reliability score of MVFSDS-R based on the Cronbach alpha was 0.95.

The fourth part was the Malay Version of the Female Sexual Function Index-6 (MVFSFI-6). The original English version of the Female Sexual Function Index (FSFI) was developed by Dr. Raymond Rosen.²⁸ It is a simple, multidimensional self-report measure of sexual functioning that includes six basic components of FSD: desire, subjective arousal, lubrication, orgasm, satisfaction, and pain; there are 19 total questions. The Malay version of the FSFI was developed and validated among married female patients in a primary health care clinic at Bandar Tun Razak, Cheras, Kuala Lumpur.²⁹ The questionnaire is used to assess the participant's sexual function for the last four weeks. The sensitivity and specificity of the MVFSFI were 99% and 97%, respectively, with a Cronbach's α ranging from 0.87 to 0.97. To provide a faster screening tool for FSD and easy use in outpatient visits, epidemiological studies, and assessment of treatment response, a six-item version of the FSFI was created.

The original English version of the Female Sexual Function Index 6 items (FSFI-6) was developed by Isidori et al. The FSFI-6 was designed for faster screening of FSD among patients and it was validated among 200 women attending outpatient clinics for sexual and reproductive medicine. The FSFI-6 includes one question for each of the six domains; each question has a score of 0–5, the scores from all six questions are summed, and a cut-off score of ≤ 19 is used to define FSD. The sensitivity and specificity were 0.93 and 0.94, respectively.³⁰

The FSFI-6 was translated to Malay language by two bilingual persons. Several discussions were held among Family Medicine Specialists and bilingual English teachers to validate the content and comprehensiveness of the MVFSFI-6. The Malay version FSFI-6 was given to 10 breast cancer patients from Hospital Raja Perempuan Zainab II, Kota Bharu Kelantan (HRPZII) for face validity. Testing of the construct validity and reliability was performed among 128 breast cancer patients in the oncology clinic at HRPZII. None of the items from FSFI-6 were eliminated. The reliability score based on the Cronbach alpha was 0.93.

Data Collection

Convenience sampling was used in this study in which eligible patients from the mentioned clinics were identified and

approached by the researchers. The aim of the study was explained to the patients, and they were ensured that the information gathered would remain confidential. Their written informed consent for participating in this study were obtained. They were guided to a separate and quiet room to complete the questionnaires. The questionnaires were completed within half an hour. Simultaneously, their medical records from the clinic were reviewed.

The respondents who scored positive for FSD after answering the questionnaire were informed regarding the findings immediately. Then, they were invited to go for second phase of the study which is a qualitative study by another team to further evaluate the FSD. For those who keen for further management of the FSD were referred to psychiatrist. While for those who are not keen for further evaluation were given the contact number to psychiatry clinic in case they decided for further evaluation in the future.

Data Analysis

The data were analyzed using SPSS version 24. The dependent variable was female sexual dysfunction score. The category independent variables were race, educational level, employment, family monthly income, family history of breast cancer, husband with medical illness, frequency of sexual intercourse, menopause status, stage of breast cancer when initially diagnosed, surgery, chemotherapy, radiotherapy, hormonal therapy and medical comorbid. The numerical independent variables were age of patient, age of husband, marriage duration, number of children, year since last childbirth, BMI, duration of breast cancer, age when breast cancer diagnosed, body image distress score.

Categories with a small sample size were identified, and meaningful combinations of categories were created. A simple linear regression was used to screen for potential factors associated with FSD scores. All variables with a p-value less than 0.25 and clinically significant variables were included in the multiple linear regression to determine the factors associated with FSD while other confounders in the model were controlled.

RESULTS

A total of 94 eligible post-surgery female breast cancer patients were included in this study, corresponding to a response rate of 98%. Two patients were unable to complete the questionnaire because they were called for a consultation during the interview. The sociodemographic and clinical data are summarized in [Table 1](#).

The mean MVBITS score was 17.0 with a standard deviation of 14.15. Only 93 patients completed the MVFSDS-R, with 39 (41.9%) fulfilling the criteria for female sexual distress. Based on the MVFSFI-6, 69 participants out of 94 (73.4%) have risk of developing FSD. The mean FSD score and its domains are shown in [Table 2](#).

Table 1. Sociodemographic and clinical data of the participants (n = 94)

Variables	Mean (SD)	n (%)
Sociodemographic characteristics		
Age (years)	49.4 (8.82)	
Race		
Malay		82 (87.2)
Chinese		8 (8.5)
Indian		2 (2.1)
Others		2 (2.1)
Educational level		
None		1 (1.1)
Primary		8 (8.5)
Secondary		56 (59.6)
Tertiary		29 (30.9)
Employment*		
Unemployed		55 (58.5)
Self-employed		4 (4.3)
Employed		35 (37.2)
Family monthly income		
Less than RM 1000		20 (21.3)
RM 1000–5000		52 (55.3)
RM 5001–10000		20 (21.3)
More than RM 10000		2 (2.1)
Family history of breast cancer		
No		65 (69.1)
Yes		29 (30.9)
Marital profile		
Age of husband (years)	52.5 (9.44)	
Marriage duration (years)	24.4 (9.42)	
Husband with medical illness		
No		53 (56.4)
Yes		41 (43.6)
Frequency of sexual intercourse		
Less than once per month		26 (27.7)
1–2 times per month		33 (35.1)
1–2 times per week		29 (30.9)
3–4 times per week		5 (5.3)
More than 4 times per week		1 (1.1)
Obstetric and gynecological history		
Number of children	3.4 (1.61)	
Years since last childbirth	14.9 (8.59)	
Menopause		
No		41 (43.6)
Yes		53 (56.4)
Medical and breast cancer characteristics		

(continued)

Table 1. Continued

Variables	Mean (SD)	n (%)
BMI (kg/m ²)	25.4 (5.07)	
Years since breast cancer diagnosis	4.2 (3.28)	
Age when breast cancer was diagnosed	45.5 (8.76)	
Stage of breast cancer when initially diagnosed		
Stage I		7 (7.4)
Stage II		52 (55.3)
Stage III		24 (25.5)
Stage IV		11 (11.7)
Previous Chemotherapy		
No		7 (7.4)
Yes		87 (92.6)
Previous Radiotherapy		
No		18 (19.1)
Yes		76 (80.9)
Previous Hormonal therapy		
No		33 (35.1)
Yes		61 (64.9)
Current Chemotherapy		
No		83 (88.3)
Yes		11 (11.7)
Current Radiotherapy		
No		90 (95.7)
Yes		4 (4.3)
Current Hormonal therapy		
No		58 (61.7)
Yes		36 (38.3)
Still on any therapy currently		
No		44 (46.8)
Yes		50 (53.2)
Medical illness beside breast cancer		
No		47 (50)
Yes		47 (50)

*One missing data point for employment status of a participants.

Table 3 shows the associated factors for FSD using a simple linear regression analysis. Family history of breast cancer, duration of marriage, and frequency of sexual intercourse were significantly associated with FSD according to the multiple linear regression (**Table 4**).

Patients who had a family history of breast cancer, have 2.2 (95%CI 0.10, 4.26, $p = 0.040$) score increase in sexual function compared to those without a family history. For every 1year increase in marriage duration, the sexual function decreases by 0.1 scores (95%CI $-0.26, -10.002$, $p 0.046$). Those who had sexual intercourse once or more per week have a 3.8 score increase in sexual function than those with less than once per week.

Table 2. Female sexual dysfunction and subdomain scores

Variables	Mean (SD)	95% CI
FSD score	15.9 (5.33)	14.83, 17.02
Subdomains		
1. Desire	2.3 (0.83)	2.12, 2.46
2. Arousal	2.3 (1.06)	2.06, 2.49
3. Lubrication	2.4 (1.16)	2.14, 2.61
4. Orgasm	2.5 (1.37)	2.21, 2.77
5. Satisfaction	3.2 (1.07)	2.96, 3.40
6. Sexual pain	3.3 (1.56)	2.99, 3.63

DISCUSSION

Breasts play a significant role in a woman's body image, sexuality, and motherhood.³¹ Sexuality is an essential and basic domain of the human experience that can be impaired during and after cancer treatment.³² Following the diagnosis and treatment of breast cancer, a person may have deteriorating effects on their sexual health due to changes in body image, fertility, and physical conditions, leading to emotional distress and sexual dysfunction. This sexual dysfunction is a neglected quality of life issue in breast cancer patients.³³

Sociodemographic Characteristics of Women With Breast Cancer

The mean participant age at the diagnosis of breast cancer was 45.5 years. This is lower than the age-specific incidence rate among breast cancer patients in Malaysia, in which the highest rate has been reported among those 55–59 years old.² Among the primary ethnic groups of patients with breast cancer in Malaysia, Malay ranks third behind Chinese and Indian women.² However, our findings differed from this pattern because the primary ethnic group in Kelantan and the east coast of Peninsular Malaysia is the Malay ethnicity. Most of the participants were housewives or currently unemployed, which is similar to breast cancer participants in a study conducted in Iran.^{6,16} According to a systematic review, married and older patients are less likely to return to work after completing treatment. Other factors that make the patient unlikely to return to work include treatment-related factors such as side effects from the chemotherapy, psychological-related factors such as changes in emotion, and work-related factors.³⁴ Our findings showed that most of the patients had no family history of breast cancer. A study from Brazil also reported that 83% of breast cancer patients had no family history of breast cancer.¹⁷ Having a family history of breast cancer can lead to earlier screening and diagnosing of breast cancer in addition to better cancer features and better quality of care, even after the treatment is provided.³⁵ With these actions, the incidence of FSD might be reduced.

Prevalence of Female Sexual Dysfunction

The current study reported a FSD prevalence of 73.4%, which suggests that the risk of breast cancer patients having FSD following breast surgery is high. The participants from this study are based in the northeastern part of Malaysia; in another study conducted in a more urbanized city in another state, the prevalence was reported to be as high as 90%.¹⁰ This difference might be due to the unique social demographic backgrounds of these two cities; for example, most participants in this study were Malays (87.2%) whereas most participants in the other study were Chinese (43%). The lower prevalence of FSD in this predominant Malay community was supported by another local study that highlighted the possibility of the Malay identity itself obscuring findings of FSD.³⁶

In their qualitative study among Malay women with FSD, Muhamad, Horey²³ found that Malay women were less likely to claim that they have FSD since they adhere to Malay identity, which is characterized by the 'appropriate' use of language in their daily communication, *adat* (local custom), which encourages them to be shy and show respect to their husband, and the influence of Islamic teaching, which allows them to easily feel *redha* (acceptance) about what they experience.^{12,37} Thus, Malay women are expected to not disclose their private history unnecessarily and are easily embarrassed when sharing any symptoms and relationship problems even with their doctors.²³ They may also ignore their symptoms because having cancer is much more stressful for them than having FSD.³⁷ The prevalence of FSD in this study is more than double than that in other chronic diseases among Malaysian populations including diabetes mellitus (26.4%), hypertension (20.1%), rheumatoid arthritis (29.4%), and obesity (12.3%).^{13-15,38}

Shandiz, Karimi¹⁶ conducted a study among breast cancer patients in Iran using the FSFI-19 and reported a slightly lower prevalence of FSD (63%) compared with the current findings. This likely occurred because the study included all patients who were on chemotherapy, and only half (51.1%) underwent combination therapy with breast surgery, which has a much greater impact on body image, thus leading to FSD. Before that, in 2012, another study conducted in Iran also highlighted the effect of breast surgery and other treatment modalities (radiotherapy and hormonal therapy) on the occurrence of FSD. They assessed sexual function before and after the completion of breast cancer treatment including surgery and found that the percentage of patients with sexual dysfunction increased from 52% to 84% after treatment completion.⁶

Meanwhile, in the United States, the prevalence of FSD among 83 breast cancer patients was very similar to our study (77%) even with different sociodemographic backgrounds and treatment options. All the breast cancer patients had already undergone breast cancer surgery, but the participants were generally older with a mean age of 56.2 years, and most of them were diagnosed early at stage 1 (37%). A total of 74.7% and 65.1% underwent radiotherapy and hormonal therapy,

Table 3. Factors associated with FSD using a simple linear regression analysis (n = 94)

Variables	FSD score	Simple linear regression		
	Mean (SD)	B* (95% CI)	t-stat	P-value
Sociodemographic characteristics				
Age (years)		-0.21 (-0.33, -0.89)	-0.35	0.001
Race				
Malay	15.8 (5.29)			
Non-Malay	17.1 (5.71)	1.33 (-1.95, 4.61)	0.80	0.424
Educational level				
Tertiary	15.6 (5.19)			
Non-tertiary	16.0 (5.43)	0.44 (-1.94, 2.82)	0.37	0.713
Employment				
Employed	16.3 (4.47)			
Unemployed	15.9 (5.73)	-0.35 (-2.54, 1.84)	-0.32	0.752
Family monthly income				
Less than RM 1000	14.7 (5.90)			
RM 1000 or more	16.3 (5.16)	1.56 (-1.11, 4.22)	1.16	0.249
Family history of breast cancer				
No	15.1 (5.65)			
Yes	17.7 (4.08)	2.61 (0.29, 4.92)	2.23	0.028
Marital profile				
Age of husband (years)		-0.18 (-0.29, -0.06)	-3.13	0.002
Marriage duration (years)		-0.22 (-0.32, -0.11)	-3.94	0.000
Husband with medical illness				
No	16.2 (5.45)			
Yes	15.6 (5.23)	-0.56 (-2.77, 1.65)	-0.50	0.616
Frequency of sexual intercourse				
Less than once per week	12.0 (5.55)			
Once or more per week	17.4 (4.46)	5.37 (3.19, 7.56)	4.88	0.000
Obstetric and gynecological history				
Number of children		0.37 (-0.31, 1.06)	1.09	0.279
Years since last childbirth		-0.24 (-0.36, -0.12)	-3.88	0.000
Menopause				
No	17.6 (4.91)			
Yes	14.6 (5.33)	-2.94 (-5.07, -0.82)	-2.75	0.007
Medical and breast cancer characteristics				
BMI (kg/m ²)		0.19 (-0.02, 0.40)	1.78	0.079
Duration of breast cancer		-0.18 (-0.51, 0.16)	-1.05	0.297
Age when breast cancer was diagnosed		-0.19 (-0.31, -0.07)	-3.09	0.003
Stage of breast cancer when initially diagnosed				
Stage I–II	16.6 (4.87)			
Stage III–IV	14.8 (5.94)	-1.75 (-3.99, 0.50)	-1.55	0.125
Previous Chemotherapy				
No	17.6 (4.89)			
Yes	15.8 (5.37)	-1.78 (-5.95, 2.39)	-0.85	0.399
Previous Radiotherapy				
No	16.3 (4.86)			
Yes	15.8 (5.47)	-0.44 (-3.23, 2.35)	-0.31	0.757
Previous Hormonal therapy				
No	15.0 (6.19)			

(continued)

Table 3. Continued

Variables	FSD score	Simple linear regression		
	Mean (SD)	B* (95% CI)	t-stat	P-value
Yes	16.4 (4.78)	1.47 (−0.81, 3.75)	1.28	0.203
Current Chemotherapy				
No	16.1 (5.34)			
Yes	14.3 (5.20)	−1.87 (−5.27, 1.52)	−1.10	0.276
Current Radiotherapy				
No	16.0 (5.11)			
Yes	14.8 (10.21)	−1.23 (−6.66, 4.21)	−0.45	0.655
Current Hormonal therapy				
No	14.8 (5.75)			
Yes	17.7 (4.06)	2.87 (0.69, 5.05)	2.61	0.011
Still on any therapy currently				
No	15.1 (5.56)			
Yes	16.6 (5.07)	1.53 (−0.65, 3.71)	1.39	0.167
Medical comorbidities				
No	15.6 (5.90)			
Yes	16.3 (4.74)	0.66 (−1.53, 2.85)	0.60	0.552
MVBITS score		0.02 (−0.06, 0.10)	0.52	0.602
MVFSDS-R				
Negative	15.3 (5.95)			
Positive	16.9 (4.22)	1.56 (0.65, 3.78)	1.41	0.163

*Crude regression coefficient.

respectively, but only 57.8% were treated with chemotherapy compared with 92.6% in the current study.⁵ Our results can also be compared with a group of younger breast cancer patients. One study with a mean participant age of 37.7 years used a similar questionnaire and showed that the prevalence of FSD among this group of breast cancer patients was only 52.5%.⁷ Thus, ethnic identity, age, treatment options, and body image have been shown to play roles in determining FSD among women with breast cancer.

Cancer is directly linked to the reduction of certain domains in sexual dysfunction. Lee, Kim⁸ reported that 31.6% of 269 women who remained sexually active post breast cancer treatment had sexual dysfunction in one or more domains according to the validated Korean version of the FSFI. For each domain, a score less than three was classified as indicative of a sexual problem. The two lowest domain scores were low desire (27.5%) and low arousal (15.2%), which is similar to the current study. The current study showed mean scores of 2.3 for both desire and arousal, which

Table 4. Factors associated with FSD in the multiple linear regression analysis (n = 94)

Variables	FSD score	Multiple linear regression		
	Mean(SD)	B* (95% CI)	t-stat	P-value
Sociodemographic characteristics				
Family history of breast cancer				
No	15.1(5.65)	1		
Yes	17.7(4.08)	2.18 (0.10, 4.26)	2.00	0.040
Marital profile				
Marriage duration (years)		−0.11 (−0.26, −10.002)	−2.02	0.046
Frequency of sexual intercourse				
Less than once per week	12.0(5.55)	1		
Once or more per week	17.4(4.08)	3.78 (1.43, 6.13)	3.20	0.002

*Adjusted regression coefficient. Backward multiple linear regression method was applied. Model assumptions are fulfilled. There were no interactions among the independent variables. No multicollinearity was detected (VIF less than 10). The assumption was checked, and no violations were present. Coefficient of determination (R²) = 0.30.

were the lowest among the six domains evaluated (Table 2). Psychological problems, such as sexual desire, can reduce sexual function to a greater degree than problems of organic or functional nature (vaginismus, sexual pain). Disturbances from sexual pain can reduce the quality of sex life but do not completely compromise it because the patients remain sexually active.³⁹

Factors Associated With Female Sexual Dysfunction

The findings from this study indicated that women who had sexual intercourse more than once per month had less sexual dysfunction compared with those who had sexual intercourse less than once per month. One explanation for this association is that a higher frequency of sexual activity can improve the intimate relationship between the patients and their partners, leading to fewer issues in sexual functioning. It may also mean that those with good spouse sexual functioning will be able to maintain woman's sexual functioning or vice versa. This has been addressed in Heng et al. (2014) finding that sexual functioning was moderately correlated ($r = 0.574$) among infertile women with their couples.⁴⁰ There is also evidence that women with SD can lead to their male encounter to have sexual dysfunction (MSD). This has been highlighted in the recent meta-analysis of 26 studies, Chew et al. (2021) found that there was a significant 3 times increase in sexual dysfunction in men who are coupled with women with sexual dysfunction.⁴¹

Apart from that, family history of breast cancer also associates well with sexual functions. Von Ah et al. (2012) revealed that those with a family history of breast cancer were found to have a higher sexual functioning score compared with women without a family history of breast cancer. This group of patients was able to receive social support from family members with a similar disease about practical approaches to handle the stress including the sexual problems associated with their breast cancer.⁴²

Furthermore, the longer the duration of marriage, the lower the sexual functioning score among our participants. This factor was not previously discussed in the literature among breast cancer patients. This association might be due to the decrease in marital satisfaction with a longer relationship length.⁴³ The most common aggravating factors among women with FSD were marital disharmony and hate and unfavorable life conditions including difficult economic or social life circumstances.⁴⁴ However, when evaluating the subdomain score of the FSD in our study, the sexual satisfaction score remained high. The meaning of sexuality changes as a woman ages due to underlying chronic diseases and menopause since they are experiencing physical changes after having breast cancer and its treatment. Furthermore, women have a passive position in their relationship with men, and the men will empathize with their wives during this difficult time. Intimate affection will become a priority for receiving sexual pleasure instead of sexual intercourse.^{37, 45}

Shandiz, Karimi¹⁶ revealed that older age was associated with a lower sexual function score. Cavalheiro, Bittelbrunn¹⁷ and Bredart, Dolbeault⁴⁶ also reported that breast cancer patients who are over 55 years old have a lower sexual function score. Younger patients reported less sexual dysfunction because they still have functional ovaries.¹¹ Conversely, Harirchi, Montazeri⁶ reported that younger breast cancer patients had FSD after breast cancer treatment. Young patients who underwent adjuvant therapy can develop premature menopause, which is associated with a poorer quality of life, lower sexual functioning, menopausal symptoms, and psychosocial distress related to infertility.⁴⁷ However, this study showed that participant age was not significantly associated with the FSD score. This finding was in agreement with two studies with sample sizes ranging from 83 to 120 participants, which is similar to our study.^{5,18}

The different treatment modalities including chemotherapy, radiotherapy, and hormonal therapy were not associated with a lower sexual functioning score in this study. FSFI scores were lower in patients with breast cancer post-diagnosis compared to those without malignancy.¹⁷ This decline in sexual functioning score during the pre-treatment stage is attributed to survival-related concerns. The FSFI scores dropped significantly further in all domains after one cycle of anthracycline-based chemotherapy. The reduction of the score post-chemotherapy is attributed to the effects of the chemotherapy itself such as hair loss, pallor, and weight gain, leading to the feeling of unattractiveness. Furthermore, chemotherapy can result in vaginal dryness, dyspareunia, and a reduced desire to have sex.^{17,48} Chemotherapy can also induce menopause, which results in less sexual activity.^{8,49} Numerous other studies have also reported diminished sexual function after breast cancer patients were given chemotherapy.^{18,50} However, the current study showed that chemotherapy was not associated with FSD, which is similar to findings from a study conducted in Brazil.⁵¹ This similarity may have occurred because the participants who were included in the study from Brazil had already completed chemotherapy and therefore the unwanted side effect is less. As in the current study, only 11 of 87 participants were still on chemotherapy, and most of them had already completed chemotherapy as well.

Breast cancer patients often receive long-term adjuvant hormonal therapy to reduce the risk of recurrence. However, adherence to the hormonal therapy is suboptimal due to the experience of symptoms such as sexual dysfunction, fatigue, and pain or concerns such as thyroid dysfunction.¹⁹ Patients treated with aromatase inhibitors were dissatisfied with their sexual life in general and reported low sexual interest, which is less likely to occur in tamoxifen-treated patients.^{52, 53} This may be why the participants in our study who received hormonal therapy did not have a lower sexual functioning score since most of them were also given tamoxifen. Radiotherapy treatment for breast cancer can lead to lower sexual, physical, and psychosocial wellbeing and a reduced satisfaction with breast appearance.⁵⁴ However, it did not seem to have a significant effect on our respondents,

which was also supported by Webber, et al.⁵⁰ in a study performed to assess the sexual functioning of breast cancer patients before and after treatment completion.

Study from Bredart, Dolbeault⁴⁶ showed that breast cancer women with one or more concomitant diseases were 2.1 times more dissatisfaction with their sexual life, after radiotherapy. The participants from the current study with medical illnesses such hypertension, diabetes mellitus, hyperlipidemia, heart disease, stroke, asthma and others were included for analysis. However, having the medical comorbidities were not a significant associated factor with the FSD among the respondents here. As discussed above, FSD among participants with medical comorbidities in local population was relatively low compared to the patients with breast cancer.

Our study selected patients who underwent breast surgery as respondents to assess their body image distress. In general, women are very concern about their body image. Being a breast cancer patient and undergone the treatment can cause significant physical and psychological distress. However, in our study the mean MVBITS score was only 17 with a maximum of 65, indicating that the participants did not have much distress with their body image post-operation. Furthermore, body image distress was not significantly associated with FSD among these women. Study done by K Hartl et al. in Germany among breast cancer patients reported that their patients also showed minor impairment of quality of life and body image. Their patients more satisfy with surgical treatment which can give them good cosmetic result and they were more fear of recurrence.⁵⁵ Another study done in Brazil among 77 breast cancer patients, they found no association between women's perception of their body image type of surgical procedure.⁵¹ These findings were surprising especially in term of their sexual relationship with their husband. This is contrary to other studies showing that patients experience greater body image problems especially among patients with post mastectomy. The patients have body image problem, difficulty in clothing and poor quality of life compared to patients with breast conserving surgery.⁵⁶⁻⁵⁸

According to the DSM-5, FSD is a general term describing several sexual health concerns including female sexual interest/arousal disorder, female orgasmic disorder, and genito-pelvic pain/penetration disorder. One of the diagnostic criteria for these disorders is clinically significant distress in the individual.⁵⁹ A systemic review showed that there is no one single scale that can create a comprehensive score, indicate superior psychometric properties, and cover all DSM-5 areas of sexual dysfunction. Additional information on the level of distress may be necessary on top of other scales like the FSFI.²¹ Raggio, Butryn⁵ studied 40 sexually active breast cancer patients using both the FSFI and FSDS-R scale and analyzed them separately. The results showed that 60% of patients met the criteria for FSD using FSFI whereas 50% met the criteria for distress based on the FSDS-R. Another study on breast cancer patients with hormonal therapy showed that among the 75 participants with low FSFI scores, up to 75%

also felt distressed about their sexual dysfunction according to their FSDS-R score.⁵³ Therefore, if the two scales are used simultaneously, fewer patients will be diagnosed with FSD.

In the current study, the Malay versions of both the FSFI and FSDS-R were applied to assess the sexual function of breast cancer patients. Although 73.4% of patients had risk of FSD, only 41.9% of patients fulfilled the criteria for sexual distress. This finding is similar to that of Raggio, Butryn⁵ as mentioned before in which there are more patients with FSD symptoms than those who feel distressed about sexual issues. Our study also showed that the sexual distress score is not a statistically significant factor associated with the FSD score. A possible reason behind this finding is the high acceptance of the Malay patients regarding sexual dysfunction; therefore, the distress level is not obvious. A local study on breast cancer patients showed that most patients accept the natural course of the disease because of their powerful spiritual belief, and they reduce the impact on their sexual dysfunction by modifying their sexual practices.³⁷ Hence, with a lower score of FSFI alone, it indicates there is higher risk of developing FSD.

Clinical Implication

This study demonstrated that three out of four patients with breast cancer experience symptoms of FSD, which has the potential to lead to further consequences.²¹ It is paramount that health care providers who care for this group of patients focus on this issue during their daily practice. This psychosocial aspect of the patient should be considered as important as the clinical management of the breast cancer itself to treat patients in a holistic manner. When approaching patients who are about to undergo surgery and other treatment modalities for breast cancer, FSD should be described as a potential complication. This allows the patients to be mentally prepared and even ask for suitable treatment if they do experience FSD after breast cancer treatment. FSD among patients who are taking hormonal therapy can result in suboptimal adherence to that therapy.⁵³ Thus, if doctors are able to identify this issue, it will be easier for the doctors and patients to handle the problem of non-compliance.

The MVFSFI-6 is simple and quick when screening for FSD among patients in the local population. By using this questionnaire, more patients can be easily screened at the outpatient department, and appropriate counseling can be provided to patients determined to have FSD. The questionnaire can be distributed to them to complete while they are waiting for their consultations. This questionnaire is also helpful because studies have indicated that normal face-to-face consultation may give rise to embarrassment when discussing very personal and sensitive matters or might prompt respondents to give socially desirable answers about particular attitudes or behaviors.⁶⁰ Moreover, cultural factors affect how comfortable people are discussing sexual issues since 'embarrassment' was cited as a reason for not consulting doctors in Malaysia.⁶⁰ This questionnaire can help overcome the culture of embarrassment among the local people

to start discussing this issue with doctors. Identifying the presence and severity of sexual dysfunction should be considered a part of cancer treatment and follow-up care since such concerns are likely to be long-standing or worsen over time.

Strengths and Limitations

The strength of this study is that this was a local study that used a simple questionnaire to screen for FSD among breast cancer patients. However, there are some limitations in our study. First, a causal relationship cannot be established since we used a cross-sectional study design. Second, there were some eligible patients who were approached but refused to participate in this study due to embarrassment and sensitivity regarding the topic. Third, the studies have shown that more than 80% of breast cancer patients never discuss sexual issues with their clinicians.⁵⁰

CONCLUSION

Three factors were shown to significantly influence the FSD score: family history of breast cancer, duration of marriage, and frequency of sexual intercourse. Our study also highlighted the significant number of patients who developed risk of FSD after breast cancer treatment. Health care providers and breast cancer patients should be aware of this potential sexual issue and address it accordingly during consultation.

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Corresponding Author: Nani Draman, MMED, Department of Family Medicine, School of Medical Sciences, Universiti Sains Malaysia (USM), Kubang Kerian, Kelantan, Malaysia. Tel: 609-7676600/6011-5184421; fax: 609-765 3370; E-mail: drnani@usm.com

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STATEMENT OF AUTHORSHIP

Ooi Poh Siang: Methodology, Investigation, Writing – Original Draft, Writing; Nani Draman: Conceptualization, Review & Editing, Supervision; Rosediani Muhamad: Conceptualization, Review & Editing, Supervision; Siti Suhaila Mohd Yusoff: Conceptualization, Review & Editing, Supervision; Norhayati Mohd Noor: Methodology; Juhara Haron: Resources; Imi Sairi Ab Hadi: Resources.

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