Research Square

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Sexual Inactivity and Sexual Dissatisfaction Among Breast Cancer Survivors and Their Partners

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Abstract

Purpose

To measure the sexual activity of breast cancer survivors and their partners to better understand the causes of sexual inactivity and sexual dissatisfaction in this population.

Methods

We investigated the proportion of sexual activity and sexual dissatisfaction in a cross-sectional study and described their association with sexual health information sexual thoughts, socio-demographic factors, body image, marital satisfaction, and mental health problems. We enrolled 438 eligible couples by convenient sampling. The statistical analysis and graphical work were completed using SPSS and Graphpad Prism.

Results

Of all participants, 58.66% (257/438) reported being sexually inactive. Of the 41.3% (181/438) sexually active participants, 96.7% (175/181) were considered to have sexual dysfunction. Patients' sexual knowledge related to their disease, such as "sexual activity may impede disease recovery (AOR = 1.642; 95% CI: 1.119~2.409)", "sexual activity may cause cancer recurrence or metastasis (AOR = 1.526; 95% CI: 1.012~2.302)", "sexual activity could change the estrogen level and stimulate tumor growth (AOR = 1.585; 95% CI: 1.021~2.460)" were significantly associated with sexual inactivity. Psychological issues related to sexual activity, and hospital's sexual health resources, such as"anxiety (AOR = 2.141; 95% CI: 1.400~3.272)", "depression (AOR =2.082; 95% CI: 1.317~3.293)", "feeling less feminine as a result of your disease or treatment (AOR = 1.526; 95% CI: 1.012~2.302) ", "dissatisfied with their physical appearance (AOR = 1.514; 95% CI: 1.010~2.271) ", "medical providers provide information on sexual health (AOR = 4.459; 95% CI: 2.044~9.730) ", "used sexual health aids (AOR = 1.514; 95% CI: 1.010~2.271) " were significantly associated with sexual dissatisfaction. We also identified that the sexual demands of the partner led to increased sexual dissatisfaction among the survivors.

Conclusions

Most Chinese breast cancer survivors were sexually inactive. Patients' sexual knowledge related to their disease was the great barrier to sexual activity. Improving psychological problems associated with sexual activity and providing professional sexual health resources in hospitals can effectively improve sexual satisfaction among survivors. In addition, the impact of the partner's proactive needs on sexual satisfaction also needs to be considered when developing couples' therapy together.

1. Introduction

According to the latest statistics on breast cancer rates globally, the number of new breast cancer cases reached 2.26 million in 2020, ranking first in the world [1]. With the improvement of the quality of cancer treatment, the age-standardized 5-year survival rate for cancer in China increased from30.9% in 2003-2005 to 40.5% in 2012-2015. At the same time, breast cancer survivors have more prolonged survival than other cancer survivors significantly [2]. How to improve the short-term or long-term complications of breast cancer survivors and improve their quality of life has become the focus of research. Among them, sexual health problems are the common potential long-term complications during cancer treatment. It was reported that 14%-100% of breast cancer survivors have sexual health problems [2, 3].

As an essential indicator of sexual health, sexual satisfaction involves the patient's personal experience and the mutual satisfaction between intimate relationships [4]. Unlike other treatment-related adverse reactions, unresolved sexual problems usually persist or worsen if ignored [5, 6]. Sexual health problems (e.g., decreased sexual desire, reduced sexual excitement and arousal, and vaginal dryness and pain) and negative body image after surgery often lead to a loss of sexual intimacy and avoidance of sexual scenes. Then, it will result in decreased sexual satisfaction [5, 7, 8]. Early sex education, pre-training rehabilitation programs, couples managing sexual change, and intimate relationships can improve the situation [9-12]. However, most research in this area has focused on the effects of treatment on the sexual health of breast cancer patients while ignoring the effects of proactive needs of partners on the sexual satisfaction of breast cancer patients. In addition to reduced sexual satisfaction, some people may stop having sex for good [5, 6]. In an Australian study, 28 % of cancer survivors abstained from sex [13]. US researchers found that in an 18-month follow-up study, 39.3 % of cancer survivors did not have sex [14]. After one year of follow-up in South Korea, 11.5 % of younger breast cancer survivors were not

sexually active after treatment [15]. Sexual inactivity was related to age, past chemotherapy, depressive symptoms, and lower perceived attraction in those studies [13-15]. Nevertheless, it ignores the problem of misconceptions about sexual activity.

We hypothesized that a partner's proactive needs would reduce sexual satisfaction in breast cancer patients due to post-treatment side effects (body image, anxiety, and depression), and faulty sexual thinking can lead to long-term inactivity in breast cancer survivors. The present study aimed to explore the condition of the sexual health for the breast cancer survivors and the possible associated factors to better understand the causes of sexual inactivity and sexual dissatisfaction in this population.

2. Methods

2.1 Participants

The present study as a cross-sectional study was conducted via an online survey between October 2020 and February 2021.The study protocol was approved by the Biomedical Ethics Review Committee of West China Hospital of Sichuan University, (#2020(1257)). All participants provided informed consent before participation. Anonymity is used to protect the privacy of patients during data collection and analysis. The inclusion criteria to participate in the current study: 1）informed consent of the participant has been obtained; 2) married, diagnosed with breast cancer, and completed initial treatment. The exclusion criteria were: 1) not being able to read and write; 2) refusing to participate. Patients who failed to complete the questionnaire with incomplete data were excluded from the final analysis.

2.2 Assessment

Socio-demographic/medical information

A modified baseline questionnaire was created by the research team based on a review from previous research literature [16-18]. We collected the basic characteristics of the participants, including standard demographic information (e.g., gender, age, education level, marital status, employment, income) and medical information related to cancer (e.g., time since cancer diagnosis, treatment type, surgery type, recurrence, and metastasis).

Hospital's sexual health resources

The information related to the hospital's sexual health resources was used to assess the sexual and vaginal health resources currently available to participants. Three questions were in this survey: 1） Does the hospital have regular sex counseling? 2）Did medical providers ask patients about their sexual health history regularly? 3) Are you embarrassed to talk about sexual health with healthcare providers?

Sexual health

The information on sexual health was collected begin with the question of “have you been sexually active in the last four weeks?” Participants who responded with "no sex" skipped to two other questions: a) Why haven't you had sex in the last four weeks? (brief description). b) How satisfied are you with your sex life overall? (having response options for different satisfaction). Participants who answered "having sex" skipped to a female self-reported sexual dysfunction index (FSFI) [19]. The FSFI contains 19 questions on six domains (desire, arousal, lubrication, orgasm, satisfaction, and dyspareunia) [20, 21]. This index has a high reliability and validity and is validated in Chinese [22]. The multidimensional scale examined participants' sexual function during the last 4 weeks. The score for each dimension is multiplied by the coefficient of the field to calculate the total score. A score ≤of 26.55 indicates the presence of sexual dysfunction.

Another question related to their partner's proactive needs was, “Have you ever been sexual demands on your partner?” The answer to this question was used to evaluate the impact of partner proactive needs on patients' sexual satisfaction, which was answered by the survivor's partner.

Patients’ sexual knowledge related to their disease

All participants were asked four questions about their sexual knowledge related to their disease. 1) Sexual activity may hinder recovery from the disease. 2) Sexual activity may cause cancer metastasis or recurrence. 3) Sexual activity may alter estrogen levels and stimulate breast cancer growth . 4) Have you ever used sex aids to relieve your dryness or pain? At the end of this part, the patients were asked to rate their own sexual thoughts either positively or negatively.

Psychological issues related to sexual activity

The psychology related to sexual activity includes anxiety, depression, body image, and marital satisfaction. The Chinese Hospital Anxiety and Depression Scale (HADS) was used to assess anxiety and depression, which was validated previously [17][23]. It consists of 7 items depression subscale and 7 items anxiety subscale. Each item is rated on a 4-point Likert scale, giving a maximum of 21 points for the depression and anxiety subscales, respectively. A cut-off points of ≥8 in each subscale is identified to detect the clinically relevant psychiatric disorder.

Four body image questions were also asked to explore patients' satisfaction with their body appearance. This questionnaire was derived from the QLQ-BR23 scale, which is a specific tool for assessing the quality of life in breast cancer [24]. 1) Do you feel less attractive because of the illness or its treatment? 2) Do you feel less feminine because of the illness or its treatment? 3) Did you find it challenging to look at yourself naked? 4) Are you dissatisfied with your figure? At the end of this part, participants were asked to complete a marital satisfaction rating. The higher the score, the higher the satisfaction.

2.3 Statistical Analysis

Continuous variables with normal distribution were expressed as mean ± standard deviation (SD), while categorical variables were expressed as frequency. Univariable and multivariate binary logistic regression was performed to figure out the risk factors for sexual inactivity and sexual dissatisfaction. Potential independent variables were first identified by univariable logistic regression. The variables with a significance level of $P < 0.10$ in univariate analysis would be included in the multivariate analysis. The odds ratio (OR) was adjusted by multivariate logistic regression for each potential independent predictor. $P < 0.05$ was set as statistical significance. Trend test analysis was used to assess the association between partner-requested sexual demand and sexual satisfaction. Statistical analyses and figure generation were performed with SPSS software (version 25.0), and GraphPad Prism (version 7.0).

3. Results

Basic characteristics of the participants

We collected 475 couples' response data, and 438 couples of them were included in the final analysis.The mean age of the participants was 46.6±8.6 (mean±SD) years. For all 438 participants, 400 (91.3%) were married, most women lived in the city (290, 66.2%), and 127 (29.0 %) were employed. Duration of disease was defined as one year (39.7%), one to two years (32.6%), or more than three years (27.6%) according to the date of diagnosis. Most of the patients had undergone a mastectomy (94.3%). Other details of the characteristics of the patients can be found in Table 1.

Sexual health issues and unmet needs

Of all participants, 58.7% (257/438) reported being sexually inactive. Of the 41.3% (181/438) sexually active participants, 96.7% (175/181) were considered to have sexual dysfunction (FSFI≤26.6).

All participants responded to the hospital's sexual health resources, and only 10.7 % confirmed that the health care provider provided information about sexual health. More than half of the participants suggested that medical providers should regularly ask patients about their sexual health history (66.0%). Most participants reported that discussing sexual health issues with health care providers could be embarrassing (86.1%). Less than a quarter of participants used sexual health aids (22.4%). In addition, we asked participants to report on their partner's sexual desires. We found that sexual dissatisfaction increases as partner-requested sexual demand ($p<0.05$) (Figure 1). Nearly half of the participants had misconceptions about the sexual health of breast cancer. The common misconceptions were affected the recovery of the disease (49.8%), it may cause recurrence or metastasis (41.6%), and it alters estrogen levels and stimulates tumor growth (48.9%) (Table 2&4).

Sexual inactivity

Of the participants, 257(58.7%) were sexually inactive. The detailed regression results are described in Table 1&3&4. According to the multivariate analysis, the risk factors associated with sexually inactive included: age >50y (vs. age <50y: OR, 1.9 ; 95% CI , 1.2~2.9; P =0.003), marital satisfaction (vs. not satisfied: OR, 0.4; 95% CI 0.2~0.7; P = 0.002), sexual activity may hinder recovery from the disease(vs. no: OR, 1.7; 95% CI, 1.1~2.4; P =0.011), sexual activity may cause cancer recurrence or metastasis (vs. no: OR, 1.5; 95% CI,

1.0~2.3; *P* =0.044), and sexual activity could alter the estrogen level and stimulate breast cancer growth(vs. no: OR, 1.6; 95% CI, 1.0~2.5; *P*= 0.040).

Sexual dissatisfaction

Of all participants, 192 (43.8%) were sexual dissatisfaction. The risk factors of sexual dissatisfaction was identified through multivariate regression (Table 1&3&4). The independent risk factors associated with sexual dissatisfaction included: postgraduate and above (vs. junior college or below: OR, 3.4 ; 95% CI , 1.0~11.4; *P* = 0.047), lived in the village (vs. cities: OR, 0.4; 95% CI 0.2~0.8; *P* = 0.008), anxiety (vs. no: OR, 2.1; 95% CI , 1.4~3.3; *P*<0.001), depression (vs. no: OR, 2.1; 95% CI , 1.3~3.3; *P* = 0.002), marital satisfaction (vs. not satisfied: OR, 0.3; 95% CI , 0.2~0.5; *P* < 0.001), feeling less feminine as a result of your disease or treatment (vs. no: OR, 1.5; 95% CI, 1.0~2.3; *P* =0.044), dissatisfied with their physical appearance (vs. no: OR, 1.5; 95% CI, 1.0~2.3; *P* =0.045), medical providers provide information on sexual health (vs. no: OR, 4.5; 95% CI, 2.0~9.7; *P* <0.001), used sexual health aids (vs. no: OR, 1.5; 95% CI, 1.0~2.3; *P* =0.045), sexual activity may cause cancer recurrence or metastasis (vs. no: OR, 1.7; 95% CI, 1.2~2.5; *P* =0.006).

4. Discussion

Our study demonstrates that breast cancer survivors have a high rate of sexual inactivity (58.7%) and sexual satisfaction (43.8%), which is consistent with previous research reports [13, 25, 26]. We found that despite the prevalence of sexual health problems, there were differences in the variables affecting sexual inactivity and satisfaction.

Sexual dissatisfaction and sexual inactivity after a breast cancer diagnosis are a common phenomenon that is undertreated, especially in breast cancer survivors. Through a cohort study, Wettergren et al. has shown that body image, anxiety, and depression were associated with sexual dissatisfaction and have lasting effects on it [25]. Karin et al. suggested that treatment-induced symptoms, depression, and age were predictors of sexual problems [26]. Through a qualitative study, Maryam et al. indicated that adverse sexual function (vaginal dryness or pain, changes in sexual desire, and decreased sexual arousal) leads to decreased sexual satisfaction among survivors [27]. Jennifer et al. concluded that a quarter of couples are not having sex because they are uninterested in it (78%) and too tired (44%) [13]. In the present study, in addition to the previous findings from other scholars, we found that misguided sexual thinking was strongly associated with sexual inactivity. Meanwhile, body image, psychology, and lack of sexual information from health care providers were more significant for sexual dissatisfaction. We also identified that the sexual demands of the partner led to increased sexual dissatisfaction among the survivors.

The impact of changes in mental and body image and intimacy on sexual dissatisfaction in breast cancer survivors after treatment has received attention, but misinformation about sex has been ignored. In our study, a particularly important finding is that sexual inactivity is associated with misleading sexual thinking. We investigated misconceptions about sexual activity to cancer recovery, recurrence, metastasis, and stimulating estrogen growth. Nearly half of the participants reported that they believed sexual activity can affect their recovery from the disease (49.8%), causes cancer recurrence or metastasis (41.6%), and may alter estrogen levels and stimulate tumor growth (48.9%). However, sexuality is not a taboo for breast cancer survivors, and no research revealed that sexual activity was related to breast cancer recurrence and metastasis. Changing this misleading thinking of cancer patients needs essential education to the patients and their partners.

Although guidelines for sexual health care for cancer survivors clearly suggest that sexual health resources should be conducive to sexual health [3, 28]. In our study, most participants were not provided with therapeutic sexual aids or any other sexual health resources (89.3%). Similar results were found in a study by Sharon et al.[29], which surveyed 25 comprehensive cancer centers affiliated with both the National Cancer Institute and the National Comprehensive Care Network. They identified that 72% of hospitals did not provide therapeutic sexual aids or any other sexual health resources. Nowadays, health care providers in China pay less concerned about sexual function when treating breast cancer [30]. In our study, the majority of survivors expected health care workers to ask about sexual health regularly (66.0 %). In the present study, our participants reported a higher degree of embarrassment around provider discussions (86.1%), which is contrary to the finding (12.0%)of Chapman et al. [31]. This difference may be caused by the taboo on sex in Chinese culture. This disparity should be further explored and taboos in communication between patients and healthcare providers improved.

Partnered sexual activity was strongly associated with the recovery of sexual function in patients with breast cancer after treatment [6, 32]. Partners' initiation of sex predicted a positive trend in the sexual health of breast cancer patients[33, 34]. Similarly, intimate partners can buffer patients' cancer-related stress and promoting positive sexual relationships[34]. In the present study, sexual dissatisfaction

increases as partner-requested sexual demand. One possible explanation is that problems that don't improve during breast cancer treatment, such as sexual discomfort, anxiety, depression, and self-image issues, all negatively affect a couple's sexual satisfaction [26]. Another possible explanation is that simply dealing with a patient's sexual relationship with an intimate partner may not improve the sexual problems of breast cancer survivors [33, 34].

There were a few predictive demographic variables of note in our study, particularly related to residence and education level. Those with higher levels of education and living in cities reported more sexual dissatisfaction than those with lower levels of education and living in the countryside. This disparity should be explored further because it might suggest that patients with lower levels of education are at even higher risk for neglect of discussion and treatment of sexual dysfunction.

In practice, there is a lack of health care in cancer management in China . According to our findings, the professional sexual education and consultation should be an effective therapy to improve the sexual knowledge of breast cancer survivors. In addition, the impact of the partner's proactive needs on sexual satisfaction also needs to be taken into account when developing couples' therapy together.

To our best knowledge, the present study is the first cross sectional study to explore the possible factors associated with sexual inactivity and sexual dissatisfaction. As an instinct problem of the observational study, there were unrealized confounders which may decrease the evidence quality of our findings. Future high-quality longitudinal studies are needed to confirm our findings.

Conclusions

Patients’ sexual knowledge related to their disease was the great barrier to sexual activity. Improving psychological problems associated with sexual activity and providing professional sexual health resources in hospitals can effectively improve sexual satisfaction among survivors. In addition, the impact of the partner's proactive needs on sexual satisfaction also needs to be considered when developing couples' therapy together.

Declarations

Funding

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Conflict of interests

The authors declare that no conflict of interest could be perceived as prejudicing the impartiality of the research reported.

Ethics approval and consent to participate

The study protocol was approved by the Medical Ethics Committee of our hospital (#2020(1257))..

Availability of data and materials

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Consent to Participate

All participants involved in this study gave their informed consent.

Consent to Publish

Patients signed informed consent regarding publishing their data.

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Code availability

Not applicable.

Authors' contributions

Qian ZHANG: Methodology; Investigation; Formal analysis; Writing-Original Draft;

Qianqian MU: Formal analysis; Wiring-Review& Editing

Yan FU: Resources; Supervision;

Xiaoxia ZHANG: Investigation; Resources;

Rujun ZHENG: Conceptualization; Resources;

Junying LI: Conceptualization; Methodology; Writing- Review& Editing; Funding acquisition;

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Tables

Table 1. The basic characteristics of the included participants and the results of multivariate logistic regression.

Demographic characteristics	Total	Sexual inactivity			Sexual dissatisfaction		
		N (%)	AOR	P value	N (%)	AOR	P value
All	438	257(58.66%)			192(43.8%)		
Age(y)							
Mean (range) (46.6±8.7)	46.62 (28-73)						
<50	305(69.6%)	165(54.1%)	1[Reference]	NA	133(43.6%)	1[Reference]	NA
>50	133(30.4%)	92(69.2%)	**1.904(1.237~2.931)**	**0.003**	59(44.4%)	1.100(0.714~1.696)	0.666
Education							
Junior college or below	226(51.6%)	130(57.5%)	1[Reference]	0.364	90(39.8%)	1[Reference]	0.072
Undergraduate	199(45.4%)	120(60.3%)	1.362(0.886~2.093)	0.159	93(46.7%)	1.326(0.902~1.949)	0.151
Postgraduate and above	13(3%)	7(53.8%)	1.084(0.338~3.479)	0.893	9(69.2%)	**3.400(1.016~11.374)**	**0.047**
Residence							
Cities	290(66.2%)	174(60%)	1[Reference]	0.370	62(48.8%)	1[Reference]	**0.024**
Towns	89(20.3%)	52(58.4%)	0.983(0.590~1.638)	0.949	130(41.8%)	1.040(0.646~1.674)	0.871
Villages	59(13.5%)	31(52.5%)	0.644(0.346~1.200)	0.166	192(43.8%)	**0.433(0.233~0.804)**	**0.008**
Household per capita income (yuan/month)							
<3000	95(21.7%)	63(66.3%)	1[Reference]	0.192	36(37.9%)	1[Reference]	0.721
3000~5000	139(31.7%)	80(57.6%)	0.640(0.364~1.126)	0.121	63(45.3%)	1.224(0.691~2.168)	0.487
<5000	204(46.6%)	114(55.9%)	0.589(0.324~1.070)	0.082	93(45.6%)	1.052(0.569~1.945)	0.871
Professional status							
On-job	127(29%)	66(52%)	1[Reference]	NA	62(48.8%)	1[Reference]	NA
Sick leave /Unemployed/ Retirement	311(71%)	191(61.4%)	1.328(0.860~2.050)	0.200	130(41.8%)	0.905(0.571~1.433)	0.669
Have children							
Yes	417(95.2%)	241(58%)	1[Reference]	NA	181(43.4%)	1[Reference]	NA
No	21(4.8%)	15(71.4%)	2.163(0.816~5.732)	0.121	11(52.4%)	1.159(0.455~2.950)	0.757
Cancer-related characteristics							
Time since diagnosis (y)							
1y	174(39.7%)	113(64.9%)	1[Reference]	0.0667	75(43.1%)	1[Reference]	0.699
1~2y	143(32.6%)	71(49.7%)	1.793(1.042~3.086)	0.035	64(44.8%)	0.793(0.462~1.361)	0.4
<3y	121(27.6%)	73(60.3%)	1.110(0.651~1.895)	0.7008	53(43.8%)	0.886(0.501~1.569)	0.679

Treatment type							
Chemotherapy	139(31.7%)	80(57.6%)	1[Reference]	0.0132	50(36%)	1[Reference]	0.061
Targeted therapy	79(18%)	55(69.6%)	0.504(0.274~0.927)	0.0277	32(40.5%)	1.212(0.687~2.137)	0.507
Hormonal therapy	196(44.7%)	102(52%)	0.959(0.567~1.622)	0.8763	97(49.5%)	1.744(1.117~2.723)	0.014
Radiotherapy	24(5.5%)	20(83.3%)	0.685(0.000~0.000)	0.0438	13(54.2%)	2.104(0.877~5.044)	0.096
Surgery treatment							
Yes	413(94.3%)	239(57.9%)	1[Reference]	NA	185(44.8%)	1[Reference]	NA
No	25(5.7%)	18(72%)	2.324(0.855~6.319)	0.0984	7(28%)	0.572(0.230~1.424)	0.23
Metastasis							
Yes	171(39%)	106(62%)	1[Reference]	NA	74(43.3%)	1[Reference]	NA
No	267(61%)	151(56.6%)	1.229(0.820~1.840)	0.318	118(44.2%)	0.956(0.640~1.427)	0.824

Abbreviation: AOR adjusted odds ratio, NA not applicable.

Table 2. Resources on post-cancer rehabilitation.

Sexual health issues and unmet needs	Yes N (%)	None N (%)
Medical providers provide information on sexual health.	47(10.7%)	391(89.3%)
Medical providers should ask patients about their sexual health history on a regular basis.	289(65.98%)	149(34.01%)
I am embarrassed to talk about sexual health with healthcare providers.	377(86.07%)	61(13.93%)
Used sexual health aids	98(22.4%)	340(77.6%)
My partner-requested sexual demand.	260(59.36%)	178(40.64%)
Sexual thoughts		
Sexual activity may impede disease recovery	218(49.8%)	220(50.2%)
Sexual activity may cause cancer recurrence or metastasis	182(41.6%)	256(58.4%)
Sexual activity could change the estrogen level and stimulate tumor growth	214(48.9%)	224(51.1%)

Abbreviation:

Table 3. Regression analysis results of psychological factors of breast cancer patients associated with sexual inactivity and sexual dissatisfaction.

Psychologic variables	Total	Sexual inactivity			Sexual dissatisfaction		
		N (%)	AOR	*P*	N (%)	AOR	*P*
Anxiety							
Yes	122(27.9%)	71(58.2%)	0.820(0.491~1.370)	0.449	70(57.4)	**2.141(1.400~3.272)**	**<0.000**
No	316(72.1%)	186(58.9%)	1[Reference]	NA	122(38.6%)	1[Reference]	NA
Depression							
Yes	99(22.6%)	62(62.6%)	1.236(0.773~1.976)	0.377	58(58.6%)	**2.082(1.317~3.293)**	**0.002**
No	339(77.4%)	195(57.5%)	1[Reference]	NA	134(39.5%)	1[Reference]	NA
Marital satisfaction							
Not satisfied	115(26.3%)	82(71.3%)	1[Reference]	0.005	73(63.5%)	1[Reference]	0.000
General	42(9.6%)	25(59.5%)	0.888(0.344~2.289)	0.805	22(52.4%)	0.630(0.308~1.290)	0.207
Satisfaction	282(64.2)	150(53.4%)	**0.371(0.198~0.695)**	**0.002**	97(34.5%)	**0.300(0.187~0.482)**	**0.000**
Felt physically less attractive as a result of your disease or treatment							
Yes	311(71%)	182(70.8%)	0.787(0.469~1.321)	0.364	142(45.7%)	0.807(0.440~1.478)	0.487
No	127(29%)	75(59.1%)	1[Reference]	NA	50(39.4%)	1[Reference]	NA
Feeling less feminine as a result of your disease or treatment							
Yes	297(67.8%)	176(59.3%)	1.051(0.581~1.900)	0.869	140(47.1%)	**1.526(1.012~2.302)**	**0.044**
No	141(322%)	81(57.4%)	1[Reference]	NA	52(36.9%)	1[Reference]	NA
Find it difficult to look at yourself naked							
Yes	323 (73.7%)	195(60.4%)	1.308(0.851~2.011)	0.221	151(46.7%)	1.314(0.729~2.366)	0.364
No	115 (26.3%)	62(53.9%)	1[Reference]	NA	41(35.7%)	1[Reference]	NA
Dissatisfied with their physical appearance							
Yes	290 (66.2%)	170(58.6%)	0.895(0.534~1.501)	0.675	137(47.2%)	**1.514(1.010~2.271)**	**0.045**
No	148 (33.8%)	87(58.8%)	1[Reference]	NA	55(37.2%)	1[Reference]	NA

Table 4. Regression analysis results of sexual health variables of breast cancer patients associated with sexual inactivity and sexual dissatisfaction.

Sexual health information	Total	Sexual inactivity			Sexual dissatisfaction		
		N (%)	AOR	*P*	N (%)	AOR	*P*
Medical providers provide information on sexual health							
Yes	47(10.7%)	23(48.9%)	1[Reference]	NA	9(19.1%)	1[Reference]	NA
No	391(89.3%)	234(59.8%)	0.634(0.279~1.442)	0.277	183(46.8%)	**4.459(2.044~9.730)**	**0.000**
Used sexual health aids							
Yes	98(22.4%)	54(55.1%)	0.891(0.558~1.421)	0.627	39(39.8%)	**1.514(1.010~2.271)**	**0.045**
No	340(77.6%)	203(59.7%)	1[Reference]	NA	153(45%)	1[Reference]	NA
Sexual thoughts							
Sexual activity may impede disease recovery							
Yes	218(49.8%)	141(64.9%)	**1.642(1.119~2.409)**	**0.011**	103(47.2%)	0.582 (0.285~1.189)	0.137
No	220(50.2%)	116(52.7%)	1[Reference]	NA	89(40.5%)	1[Reference]	NA
Sexual activity may cause cancer recurrence or metastasis							
Yes	182(41.6%)	116(63.7%)	**1.526(1.012~2.302)**	**0.044**	94(51.6%)	**1.722(1.172~2.530)**	**0.006**
No	256(58.4%)	141(55.1%)	1[Reference]	NA	98(38.3%)	1[Reference]	NA
Sexual activity could change the estrogen level and stimulate tumor growth							
Yes	214(48.9%)	114(53.3%)	**1.585(1.021~2.460)**	**0.040**	82(38.3%)	0.860 (0.454~1.629)	0.643
No	224(51.1%)	143(63.8%)	1[Reference]	NA	110(49.1%)	1[Reference]	NA

Figures

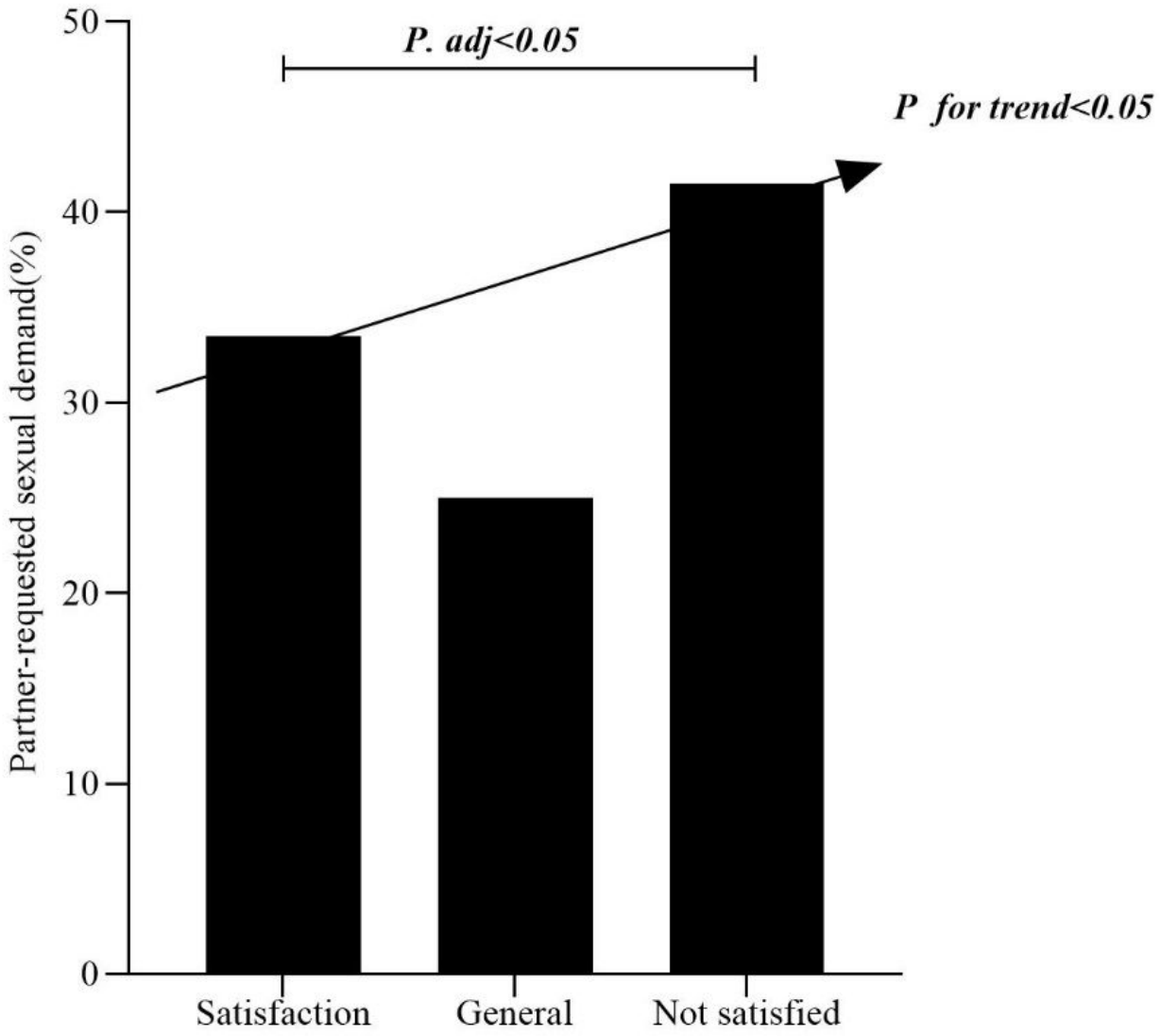


Figure 1

The sexual dissatisfaction regarding to different partner-requested sexual demand.

Supplementary Files

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