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Effects of sexual counseling and education based on self-efficacy theory on the sexual function of women with breast cancer

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Abstract

Background Given the negative impact of breast cancer and its treatment on women's self-efficacy in various areas, including sexual function, investigating and understanding ways to enhance sexual function is crucial. The current study aimed to examine the impact of sexual counseling and education based on self-efficacy theory on the sexual function of women with breast cancer.

Method The trial was a randomized controlled trial with a parallel design, including a pre-test, post-test, and one-month follow-up. Fifty married breast cancer survivors, having a disorder in at least one domain of sexual function (score below 3.9) and meeting other research criteria, visited clinics and hematology departments of hospitals in Bushehr (a city in southern Iran) between 2023 and 2024 were purposefully selected and randomly assigned to intervention and control groups using block randomization. The intervention group received two educational sessions and three counseling sessions based on the self-efficacy theory. Data collection utilized demographic information forms and a sexual function index for women, which consists of 19 questions that assess six domains of women's sexual function (desire, arousal, lubrication, orgasm, satisfaction, and pain during intercourse) over a period of 4 weeks and completed by participants during the pre-test, post-test, and follow-up stages. Descriptive statistics (mean, standard deviation, percentage, frequency) and analytical tests, including the independent t-test, Mann–Whitney U test, Chi-square test, and Fisher's exact test and repeated-measures analysis of variance (ANOVA) followed by post hoc LSD test were used for data analysis, considering a significance level of less than 0.05 in all cases.

Result The mean age of patients in the intervention and control groups was 44.42 ± 4.88 and 43.44 ± 5.20, respectively. The two groups did not have statistically significant differences in demographic and disease-related variables ($P > 0.05$). An independent t-test showed no significant difference between the two groups in terms of the average pre-test sexual function score and its domains ($P > 0.05$). Changes in overall sexual function and the arousal, orgasm, lubrication, and satisfaction domains from pre-test to post-test and from pre-test to follow-up increased in the intervention group and decreased in the control group, with statistically significant differences between the two groups ($P < 0.05$). However, the average changes from post-test to follow-up were not statistically significant between the two groups.

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Conclusion The total FSFI scores and most of its domains in the intervention group were higher than those in the control group, which can be attributed to the impact of sexual education and counseling. Therefore, the use of this non-invasive, cost-effective, and straightforward method along with other medical approaches is recommended.

Trial registration IRCT20231102059930N1, 4 December 2023, Prospectively registered, at http//www.irct.ir.

Keywords Breast cancer, Self-efficacy theory, Sexual counseling, Sexual education, Sexual function

Background

Breast cancer (BC) is the most common malignancy among women worldwide, with approximately 1.7 million new cases diagnosed annually. It accounts for 25% of all cancers in Iran, and its incidence is increasing in Iran and worldwide [1–4]. Breast cancer incidence age in Iran is a decade younger than in developed countries [1]. Therefore, breast cancer poses a significant health challenge in the Eastern Mediterranean region, including Iran [5]. Currently, significant efforts are being made to improve the diagnosis and treatment of breast cancer. As a result, the survival rate of breast cancer patients has increased in recent years. However, breast cancer treatment is associated with side effects [6–8]. Side effects such as nausea and vomiting, weakness, fatigue, hair loss, skin burns, lesions, changes in breast appearance (which are considered a sexual identity in various cultures), ovarian dysfunction, and subsequent decreases in estrogen levels lead to vaginal atrophy, decreased vaginal lubrication, reduced vascular congestion, and decreased libido. These side effects profoundly negatively impact in individuals' body image and self-esteem [9–11]. Ultimately, through physical debilitation, breast cancer patients can experience a reduced ability to perform daily tasks; frequent and prolonged hospitalizations; disruption of feminine identity and personality; issues such as fatigue, anxiety, depression, feelings of isolation and social limitations; fear of disease progression and death; sleep disturbances; psychological distress; irritability; and, in the case of being married, fear of infertility and concerns about spousal reactions, which significantly diminish their self-efficacy [8, 12–15]. Self-efficacy refers to an individual's belief in his or her ability to cope with cancer and its treatment [16]. Self-efficacy of patients with various types of cancer, especially breast cancer, has been widely studied [8, 12–15]. Several studies have reported that highly self-efficacious patients experience less anxiety and depression and are able to adapt to stressful situations and maintain a good quality of life [16]. Conversely, low levels of self-efficacy have a negative impact on all dimensions of quality of life [8]. Moreover, sexual function has received particular attention among the various components of quality of life [11]. Sexual function in women is defined as the ability to achieve arousal, sexual desire, excitement, and orgasm [17], which is an important aspect of health and an integral part of a satisfying life, aiming to achieve sexual pleasure [18, 19]. Studies have shown that at least 68 to 70% of women with breast cancer experience some form of sexual dysfunction [20]. In Iran, a study showed that 47% of Iranian women with breast cancer have sexual dysfunction [21]. Sexual dysfunction can have detrimental effects on quality of life, self-esteem, sense of completeness, and interpersonal relationships for women, leading to emotional problems, family conflicts, divorce, and fertility-related issues [22]. Most individuals working to address sexual issues have observed that when assessing sexual problems and identifying their nature, self-efficacy plays a determining role as an intermediary variable [23]. In general, sexual function is an important aspect of quality of life that is directly affected by the psychological burden of breast cancer and its treatment, as well as through the reduction of self-efficacy [8, 19, 21, 24]. Therefore, taking action to manage these complications seems necessary. Given that one of the main issues in today's society is the lack of awareness about sexual issues [25], sexual education and counseling are important for improving sexual function [26]. Studies show that educational interventions lead to a reduction in sexual anxiety and family discord, providing more opportunities for emotional and mental exchange within the family [25, 27]. In such an environment, the likelihood of anxiety and depression in children also decreases [25]. Additionally, in education and counseling groups, many cancer patients learn to talk about their fears and inner distress, cope with their psychological pressures, accept their illness, and take responsibility for themselves [28]. Studies have shown that the most effective educational programs are based on theory-driven approaches that stem from behavior change models [29]. One of the behavioral change theories in the field of learning is Bandura's social-cognitive theory [30]. According to this theory, self-efficacy, which is an individual's belief in his or her ability to perform a specific task, is one of the strongest determinants of human behavior. When self-efficacy levels are high, there is a greater likelihood that an individual will effectively perform a specific behavior. Conversely, low levels of self-efficacy are associated with pessimistic thoughts about one's abilities, leading to an inability to control one's emotional states and feelings of emptiness, sadness, and vulnerability to life events and pressures [31]. The intervention based on the self-efficacy theory includes four main aspects: successful individual

experiences, vicarious experience (observation or imitation of successful patterns), verbal persuasion, and attention to patients' physiological and emotional responses [32].

Therefore, considering that in societies like Iran, due to the taboo nature of sexual issues, only a few studies have been conducted on the impact of interventions on sexual problems in breast cancer patients [21], and in most studies, existing models and theories have not been considered [21, 33–37], it seems essential to conduct psychological interventions based on behavior change theories in these patients. Since self-efficacy is considered a key psychological resource for coping with chronic illnesses [8, 12, 38], studies have shown that sexual self-efficacy is essential for ensuring satisfactory and desirable sexual performance [39, 40], The sexual self-efficacy of women with breast cancer is lower than that of healthy women [14], and interventions based on self-efficacy theory have not been conducted in this population, incorporating self-efficacy into interventions aimed at sexual problems in women with breast cancer may improve sexual function. In light of the aforementioned aim, the following question hypothesis is proposed: Does sexual counseling and education based on self-efficacy theory result in improved sexual function among female breast cancer survivors?

Methods

Design

This was a randomized controlled trial with two parallel arms, including an intervention group and a control group. The aim was to investigate the impact of counseling and sex education based on self-efficacy theory on the sexual function of women with breast cancer. The study used a pre-test, post-test, and follow-up measures of sexual function and its domains. The pre-test was conducted immediately prior to the initiation of the intervention to ensure that both the intervention and control groups exhibited comparable levels of sexual function at the outset of the study. In accordance with the timing of previous studies [5, 17] and the fact that the Female Sexual Function Index (FSFI) assesses sexual performance over the past four weeks, the post-test was conducted immediately following the completion of the five-week intervention period, and the follow-up assessment was performed one month later. This allowed for the measurement of sexual function during the intervention period and after its completion.

Patient population and sampling

The research population included women diagnosed with breast cancer who visited the hematology wards of hospitals and clinics in Bushehr (a city in southern Iran) between 2023 and 2024. Based on the mean and standard deviation of sexual function in the intervention (21.49±6.7) and control (14.8±10.1) groups, as reported in a previous study by Fatehi et al. [36], and considering a type I error (α) of 0.05 with a power of 85%, the calculated sample size was 42. In conclusion, the sample size of 50 individuals (25 per group) was deemed sufficient, allowing for a 20% dropout probability. The 50 women diagnosed with breast cancer who met the inclusion criteria were selected for participation in the study through purposive sampling. The research samples were selected from the hematology department and hematology clinics. To ensure an equal distribution of intervention and control group samples across each center and finally, an equal number of participants in the intervention and control groups and minimize the role of confounding variables, block randomization was employed. Block randomization was carried out using 5 blocks of 10. In the initial stage, blocks of ten were prepared using labels A (intervention group) and B (control group). Out of 252 different possible block arrangements, five were randomly selected, with each block having a 50% chance of belonging to either group (Allocation ratio:1:1). To this end, 50 identical cards were prepared, with 25 marked with code A representing the intervention group and 25 marked with code B representing the control group. Each of the 10 cards was assigned to one block, with five cards marked with the letter A and five marked with the letter B. For each block, ten opaque envelopes were prepared and numbered in alphabetical order. The prepared cards were placed in these envelopes according to the order of the block. These envelopes were then placed in a larger opaque envelope labeled with the block number. The block randomization was kept concealed until participant allocation. As the sampling began, envelopes were opened sequentially, and individuals were assigned to the intervention (letter A) or control (letter B) group based on the letter written on the envelope they selected. The block randomization was conducted by an individual not familiar with the research characteristics using random allocation software.

Inclusion and exclusion criteria

The inclusion criteria were consent and willingness to participate in the study; being married and living with a spouse; having undergone breast surgery or at least one lumpectomy; being of reproductive age; having the physical ability to attend the meetings; at least three months have passed since the last chemotherapy/radiotherapy; and having at least one domain of sexual dysfunction. The diagnosis of sexual dysfunction was based on a score of less than 3.9 (in at least one domain of sexual function) according to the Women's Sexual Function Index. The exclusion criteria were patient's death, occurrence of stressful events, pregnancy, initiation of psychiatric

pharmacotherapy and recurrence of disease at the time of our intervention; having disorders interfering with sexual functioning (psychological problems, Alzheimer's disease, mental retardation, or multiple sclerosis); use of medications affecting sexual activity and antidepressants based on self-report; participation in sexual education or counseling sessions in the past six months; and inaccessibility of the patient (travel, migration).

Measures

The data were gathered via the administration of a demographic and disease-related information form, as well as the FSFI. The demographic and disease-related information form includes the age, occupation, and education of the patient and her husband; the duration since marriage; the duration of illness; the time since the last chemotherapy; the type of surgery; the consumption of tamoxifen; the history of sexual problems before the illness; and the history of sexual problems in the spouse.

FSFI consists of 19 questions that assess six domains of women's sexual function (desire, arousal, lubrication, orgasm, satisfaction, and pain during intercourse) over a period of 4 weeks. Sexual desire is assessed using two questions, arousal and lubrication with four questions, and orgasm, satisfaction, and pain with three questions. The response range for items 1, 2, 15, and 16 is from 1 to 5, while for other questions, scoring ranges from 0 to 5. The coefficients for the items related to the two, three, and four-choice domains are 0.6, 0.4, and 0.3, respectively. The total score, which is calculated by summing up the scores of the 6 domains, ranges from 2 to a maximum of 36. Higher scores indicate better sexual function. In each domain, the scores under 3.9 were considered as sexual dysfunction (score < 3.9 was < 65% of maximum achievable score in each domain) [41, 42]. The translation and cultural adaptation stages of the questionnaire were conducted by Bagherzadeh et al. [42] in Iran, and its validity was examined by experts. In the present study, the reliability of the questionnaire was confirmed with a Cronbach's alpha coefficient of 0.85.

Data collection

This intervention was conducted from December 4, 2023, to March 7, 2024. After the proposal was approved and ethical code obtained, the study protocol was registered in the Iranian Clinical Trials System (IRCT20231102059930N1||http://www.irct.ir/) with the Clinical Trial Registry [43] and the necessary permits were obtained from the Research Deputy of Bushehr University of Medical Sciences. Upon receiving a written introduction letter from the Research Deputy of Bushehr University of Medical Sciences, the researcher visited the research environment. After reviewing the medical records of the patients, married patients in fertile ages who had undergone at least a lumpectomy and had at least 3 months passed since their chemotherapy or radiotherapy were selected. After finding their contact numbers, they were contacted to invite them to participate in the study, and the study objectives were briefly explained to them. They were then asked if they were willing to participate in the study at a specific time in the hematology wards of hospitals and clinics in Bushehr. During the face-to-face visit, the participants were evaluated for inclusion and exclusion criteria, the study objectives and methods were thoroughly explained to them, and after reassuring them and ensuring the confidentiality of participants' information, they completed the informed consent form, demographic and disease-related information form, and FSFI. Among them, Patients who scored below 3.9 in at least one domain of sexual function and met other inclusion criteria were included in the study. The patients were then randomly assigned to either the intervention or control group using block randomization. In this manner, the blocking envelopes were opened, and the envelope containing each card was presented to the participant in accordance with the envelope number. Upon opening the envelope, the participant and the researcher were able to ascertain their assigned group. Initially, after coordinating with the intervention group patients, the most suitable time of the day agreed upon by the majority was selected, and then the date and time of the intervention were communicated to them over the phone. The intervention group received 2 group training sessions for 90–120 min (one session per week). The educational media used included photographs, videos, and PowerPoint presentations. Patients were subsequently divided into groups of 3–4 people (based on the day, time, and location suitable for each individual), and each group received 3 counseling sessions for 2 h (one session per week) during one month [44]. Reminders of the time and location of the sessions were sent via text message by the researcher the day before the counseling. Finally, weekly follow-up was performed by phone for educational reminders, counseling, and answering individual questions in the intervention group for one month (Fig. 1). The content of the educational and counseling sessions was designed based on the four main aspects of self-efficacy theory, which include individual successful experiences, vicarious experiences (observing or expressing experiences of successful models), verbal persuasion, and attention given to patients' physiological and emotional reactions [32]. The content taught was gathered based on reputable references and its validity was confirmed by two professors in the fields of clinical psychology and health education. The contents presented in the training and counseling sessions are listed in Table 1. The intervention methods included group education, group counseling, group discussions, question and answer

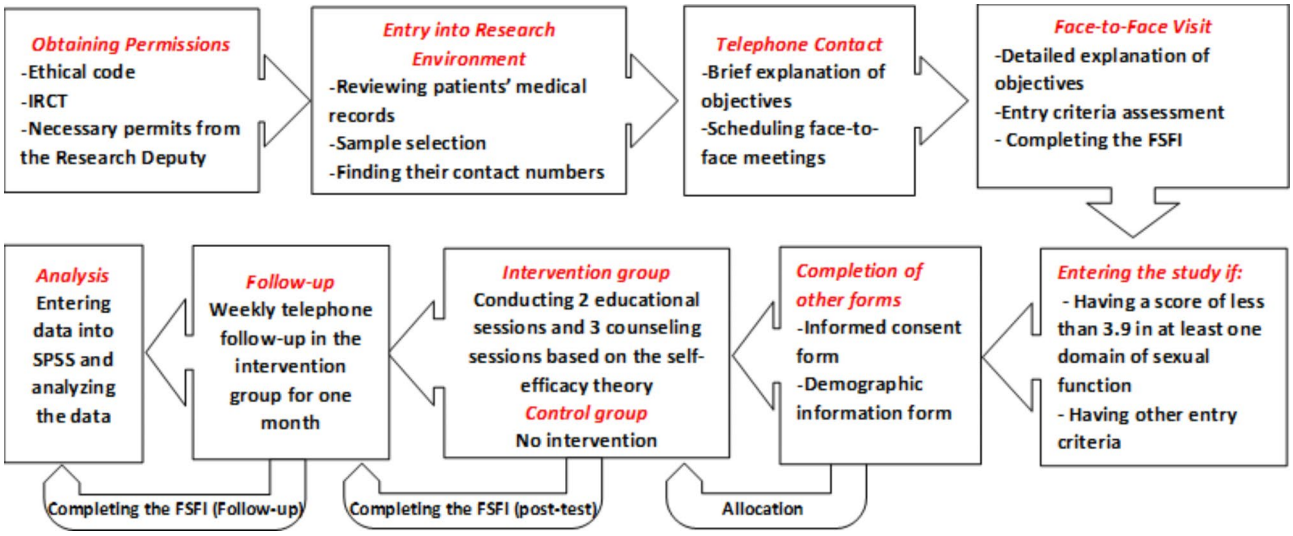

Fig. 1 Flowchart of the data collection

Table 1 Educational and consulting intervention based on self-efficacy theory

Sessions	Content/Techniques to increase self-efficacy
First	- Offering insights into the advantages of enhancing sexual performance (Raising awareness and motivating the audience by recalling positive past experiences to boost self-confidence and encourage behavior) - Acquiring knowledge about Anatomy and function of the male and female reproductive systems, understanding how sexual organs influence the development of satisfying sexual relationships, and comprehension of the sexual cycle (Breaking down behavior into simple components)
Second	- Describing common sexual disorders in both men and women. - Providing solutions for sexual dysfunction and creating a satisfying relationship (helping alleviate concerns, anxiety, and depression related to sexual performance issues, paying attention to physiological responses) - Offering interviews or the presence of successful patients in this field to build self-confidence (providing role models or surrogate experiences)
Third to fifth	- Familiarizing oneself with effective interpersonal skills in creating a sexual relationship - Providing solutions for sexual dysfunction (helping alleviate concerns, anxiety, and depression related to sexual performance issues, paying attention to physiological responses) - Identifying personal barriers (false beliefs) and paying attention to physiological responses (anxiety and depression) - Offering strategies to overcome obstacles in sexual relationship disorders after surgery and expressing the experiences of successful individuals (providing role models or surrogate experiences) - Providing positive feedback and verbal encouragement in response to patients' efforts to change false beliefs

sessions, participatory learning techniques, and sharing positive experiences.

The intervention was conducted by the first author, a master's student in midwifery counseling with a valid credential in the field of sexual education and counseling. The first author was supervised by the corresponding author, who holds a master's degree in midwifery and a master's degree in psychology and is an expert in sexual counseling. The interventions took place in a hall located on Moallem Street in the city of Bushehr. The environment of the hall was calm, quiet, and equipped with visual teaching facilities and chairs. No intervention was provided to the control group. To respect ethical considerations, at the end of the study, the educational booklet, collected based on reliable references, was given to the control group. The FSFI was completed again immediately and one month after the intervention by two groups, the intervention group and the control group.

Data analysis

Among the 50 participants, two individuals from the control group and three individuals from the intervention group did not wish to continue participating in the study. Therefore, the analysis was conducted on 45 individuals (22 in the intervention group and 23 in the control group) (Fig. 2). The data were analyzed using SPSS 20 software. Initially, the data were checked for outliers and missing values, but no outliers were observed, and missing data were at a minimal level of 1%, which was replaced with the mean. The Shapiro-Wilk test was used to assess the normality of variable distributions. All variables in both groups and at all three evaluation times showed normal distributions, but the difference scores did not have normal distributions. The data were described using mean, standard deviation, percentage, and frequency. The

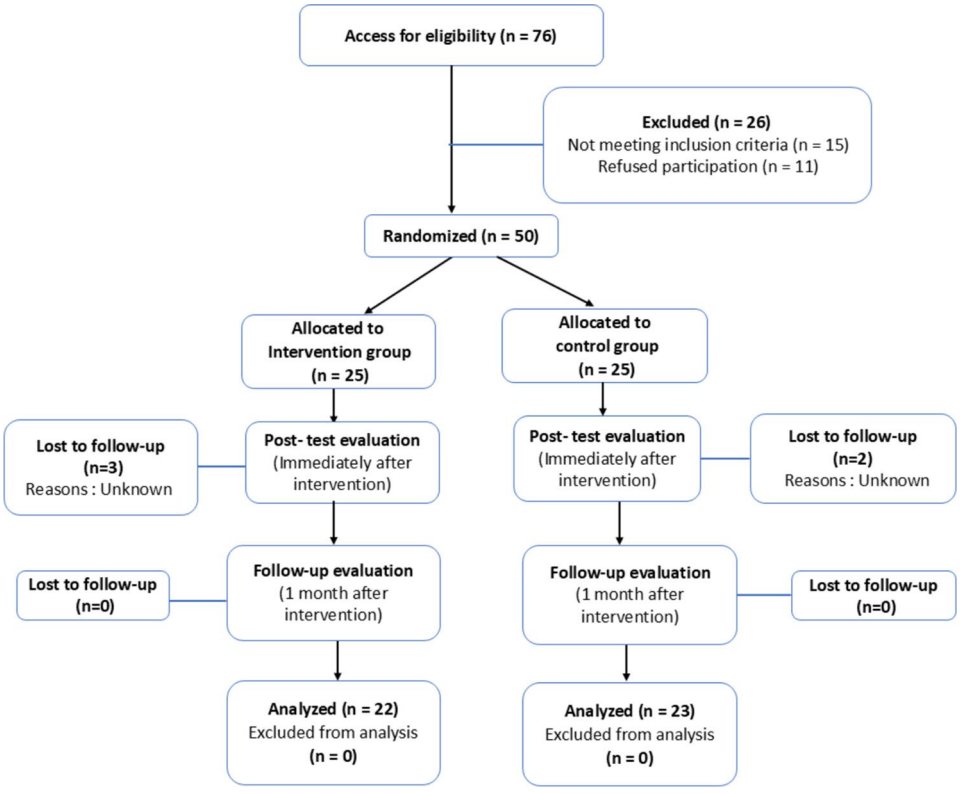

Fig. 2 Consort diagram

analytical tests, including the independent t-test, Mann–Whitney U test, Chi-square test, and Fisher's exact test, were used to compare demographic and disease related variables. Additionally, Within-group and between-groups comparisons were made to test the research hypothesis, i.e., the effect of the intervention on sexual performance. For Within-group comparisons repeated-measures analysis of variance (ANOVA) followed by post hoc LSD test was used. For between-group comparisons, the mean changes in sexual function and its domains from pre- to post-test between the intervention and control groups were compared using the Mann-Whitney test. The significance level was set at <0.05.

Results

The average age of participants in the intervention and control groups was 42.64±4.88 and 43.44±5.20, respectively. The mean time since diagnosis in the intervention and control groups was 35.04±22.69 and 27.92±10.36, respectively. There was no statistically significant difference between the two groups in terms of demographic variables (Table 2). Additionally, the median number of children was examined for both groups, which was 2 children for each group, and there was no statistically significant difference between the two groups in this variable ($P>0.05$). The mean total sexual function score before the intervention in the intervention and control groups was 16.50±8.30 and 16.04±8.24, respectively. An independent t-test between the two groups did not show a statistically significant difference in the mean pre-test sexual function score and its domains ($P>0.05$). Repeated measures analysis of variance showed that the interaction group-by-time was statistically significant for overall sexual function and the arousal, orgasm, and Satisfaction domains. Post- hoc tests indicated that in the intervention group, the mean post-test and follow-up scores for overall sexual function and the arousal and satisfaction domains were significantly higher than the pre-test scores. However, there was no significant difference between post-test and follow-up scores. For the orgasm domain, only the post-test score in the intervention group was significantly higher than the pre-test score. Furthermore, in the control group, the mean follow-up scores for overall sexual function and the orgasm domain were significantly lower than the pre-test scores. Additionally, in the control group, the mean follow-up scores for overall sexual function and the orgasm and satisfaction domains were significantly lower than the post-test scores (Tables 3 and 4). Between-group comparisons showed that the average changes in overall sexual function and the arousal, orgasm, lubrication, and satisfaction domains from pre-test to post-test and from pre-test to follow-up were increasing in the intervention group and decreasing in the control group, with a statistically

Table 2 Comparison of demographic variables and the variables related to disease between intervention and control groups

Variable		Intervention group	Control group	*P* value (Statistics)
		Mean ± SD[a]	Mean ± SD[a]	
Age of participants (years)		42.64 ± 4.88[a]	43.44 ± 5.20[a]	0.578(-0.561[***])
Husband's age of participants (years)		48.32 ± 6.32[a]	47.64 ± 7.42 [a]	0.745(0.328[***])
Duration of marriage (years)		19.76 ± 6.99[a]	17.44 ± 9.69[a]	0.336(0.971[***])
Duration of cancer diagnosis (months)		35.04 ± 22.69[a]	27.92 ± 10.36[a]	0.160(1.427[****])
The time elapsed since the last chemotherapy (months)		18.44 ± 9.78[a]	16.12 ± 9.92[a]	0.409(0.833[***])
		N (%)	N (%)	
Education level	Primary school	5(22.7)	8(34.8)	0.528(2.682[**])
	Secondary school	5(22.7)	8(34.8)	
	Diploma	8(36.4)	5(21.7)	
	Academic	4(18.2)	2(8.7)	
Job	Employed	5(22.7)	5(21.7)	0.636(0.006[*])
	Housewife	17(77.3)	18(78.3)	
Husband's education level	Primary school	2(9.1)	3(13)	0.395(3.163[**])
	Secondary school	4(18.2)	7(30.4)	
	Diploma	9(40.9)	4(17.4)	
	Academic	7(31.8)	9(39.1)	
Husband's Job	Worker	0	1(4.3)	0.441(3.721[**])
	Unemployed	0	1(4.3)	
	Employee	5(22.7)	3(13)	
	Retired	2(9.1)	5(21.7)	
	Freelancer	15(68.2)	13(56.5)	
Income status	Less than expenses	8(36.4)	9(39.1)	0.989(0.314[**])
	Equivalent expenses	13(59.1)	13(56.5)	
	More than expenses	1(4.5)	1(4.3)	
Breast surgery	Unilateral mastectomy	11(50)	10(43.5)	0.879(0.476[**])
	Bilateral mastectomy	1(4.5)	1(4.3)	
	Lumpectomy	10(45.5)	12(52.2)	
Tamoxifen use	None	13(59.1)	16(69.6)	0.422(1.828[**])
	20 mg	4(18.2)	5(21.7)	
	20 mg	5(22.7)	2(8.7)	
Sexual disorder before the disease	Yes	2(9.1)	3(13.0)	0.673(0.178[**])
	No	20(90.9)	20(87.0)	
Husband's Sexual disorder	Yes	1(4.5)	3(13.0)	0.317(1.003[**])
	No	21(95.5)	20(87.0)	

*Chi–square test is done; **Fisher exact test is done; *** Independent t test is done; ****Maan–Whitney is done; a: Mean and standard deviation are reported

N=Number; SD=Standard deviation

significant difference between the two groups. The average changes from the post-test to the follow-up were not statistically significant between the two groups (Table 5).

Discussion

This study was conducted with the aim of investigating the effect of sexual counseling and education based on self-efficacy theory on the sexual function of women with breast cancer. Therefore, the research question was: Does sexual counseling and education based on self-efficacy theory result in improved sexual function among female breast cancer survivors?

In analyzing the research hypotheses, both within- and between-group comparisons indicated that the intervention led to an increase in overall sexual function scores and sexual desire, lubrication, orgasm, and sexual satisfaction domains during the intervention period compared to pre-intervention, extending to the follow-up period in the intervention group which meant that the sexual counseling and education based on self-efficacy theory was effective on overall sexual function and the mentioned domains. These findings align with studies by Saboula et al. [35], Zanganeh et al. [45], and others, contrasting with studies by Bagherzadeh et al. [46], regarding lubrication domain, Marvi et al. [47], regarding arousal domain, and Alimohammadi et al. [32], regarding arousal, orgasm, and sexual satisfaction domains. The difference in results between the present study and Bagherzadeh et al. may stem from the type of intervention; Bagherzadeh et al. focused on mindfulness training,

Table 3 Determining the effect of time and group-by-time interactions on sexual function and its domains

Domain	Time	Group		The effect of time			Group*time effect		
		Intervention	Control						
		Mean ± SD	Mean ± SD	Mean square	F	P value	Mean square	F	P value
Desire	Pre-test	2.75 ± 0.92	2.71 ± 1.01	1.184	2.262	0.121	0.595	1.136	0.318
	Post-test	3.03 ± 0.60	2.61 ± 0.92						
	Follow-up	2.73 ± 0.73	2.45 ± 0.94						
Arousal	Pre-test	2.21 ± 1.41	2.33 ± 1.41	0.998	3.232	0.057	2.111	6.835	0.004
	Post-test	2.65 ± 1.45	2.27 ± 1.42						
	Follow-up	2.51 ± 1.37	2.00 ± 1.26						
Lubrication	Pre-test	2.92 ± 1.81	2.77 ± 1.89	0.550	1.474	0.236	1.188	3.185	0.055
	Post-test	3.27 ± 1.74	2.75 ± 1.90						
	Follow-up	3.22 ± 1.74	2.65 ± 1.85						
Orgasm	Pre-test	2.42 ± 1.51	2.35 ± 1.79	1.675	6.041	0.005	1.399	5.045	0.011
	Post-test	2.69 ± 1.54	2.28 ± 1.78						
	Follow-up	2.49 ± 1.44	1.93 ± 1.50						
Satisfaction	Pre-test	3.09 ± 1.41	2.92 ± 1.51	1.922	4.402	0.025	2.669	6.112	0.008
	Post-test	3.65 ± 1.56	2.90 ± 1.67						
	Follow-up	3.47 ± 1.76	2.67 ± 1.53						
Pain	Pre-test	3.11 ± 2.00	2.96 ± 1.95	0.611	0.822	0.401	0.611	0.822	0.401
	Post-test	3.38 ± 1.89	3.03 ± 1.92						
	Follow-up	3.38 ± 1.85	2.91 ± 1.91						
Total score of FSFI	Pre-test	16.50 ± 8.30	16.04 ± 8.24	29.873	4.758	0.016	45.703	6.112	0.002
	Post-test	18.67 ± 8.20	15.84 ± 8.55						
	Follow-up	17.80 ± 8.36	14.61 ± 8.08						

The statistical test used is repeated-measures ANOVA

$P < 0.05$ is significant

while lubrication during intimacy is not solely caused by psychological disorders; it has more of a physical nature and requires an intervention that covers the physical aspect of this domain [35]. In the present study, in addition to increasing arousal, which in turn improves genital moisture, the use of lubricants focusing on physiological responses strategy was taught as part of the self-efficacy theory and examples of successful individuals' experiences in this area were provided. It is likely that individuals learned to address their issues by obtaining a lubricant gel. Non-hormonal treatments such as using vaginal moisturizers reduce dryness, irritation, and itching, enhancing vaginal moisture [48]. The discrepancy in results between the present study and Marvi et al. may be due to the type of intervention; Marvi et al. provided sexual education, while in the current study, sexual counseling was also offered alongside education. Cognitive-behavioral interventions consist of two main mechanisms: first, they increase individuals' cognitive skills by raising awareness about sensory focus or arousal; second, they eliminate negative attitudes or thoughts that interfere with proper sexual function and replace them with better and constructive attitudes and thoughts [49]. Although sexual education increases individuals' awareness of sexual issues by covering cognitive mechanisms [17], it is counseling that deals with individuals' attitudes, beliefs, and values [50]. In the current study, exercises focusing on sexual and non-sexual sensory concentration were directly provided in line with the strategy of attention to physiological reactions from Bandura's self-efficacy model and the elimination of false beliefs in the strategy of removing personal barriers from the self-efficacy model. By focusing on these two mechanisms, both education and counseling were given, and it appears that the intervention in this way led to an improvement in the arousal domain.

The difference in results between the present study and Alimohammadi et al. may be due to variations in the number of individuals in counseling groups and differences in initial scores of these domains. In Alimohammadi et al., counseling was conducted in groups of 48 individuals. One of the significant limitations of group counseling is the lack of disclosure of some personal and sexual issues [51]. Although the present study also faced this limitation, counseling was conducted in groups of 3–4 individuals, and through weekly follow-up calls, the opportunity to discuss issues not raised in the group counseling sessions was provided. Additionally, in Alimohammadi et al., initial average scores of arousal, orgasm, and sexual satisfaction were higher and approximately double those of the current study. Studies have shown that when a variable has low levels (such as in the current study), even a small intervention can lead to some improvement, but when levels are high (as

Table 4 Comparing pairwise within-group variables where the group-by-time interaction has been found to be significant for them

Domain	Group	Time A	Time B	Mean difference (A – B)	SE	*P* value	Confidence Interval 95% for Mean difference
Arousal	Intervention	Post-test	Pre-test	0.436	0.097	< 0.001	0.240; 0.632
		Follow-up	Pre-test	0.300	0.145	0.045	0.007; 0.593
			Post-test	-0.136	0.108	0.214	-0.354; 0.082
	Control	Post-test	Pre-test	-0.055	0.097	0.577	-0.250; 0.141
		Follow-up	Pre-test	-0.273	0.145	0.067	-0.565; 0.020
			Post-test	-0.218	0.108	0.050	-0.436; 0.001
Orgasm	Intervention	Post-test	Pre-test	0.273	0.099	0.008	0.074; 0.472
		Follow-up	Pre-test	0.073	0.128	0.572	-0.185; 0.331
			Post-test	-0.200	0.109	0.073	-0.419; 0.019
	Control	Post-test	Pre-test	-0.073	0.099	0.464	-0.272; 0.126
		Follow-up	Pre-test	-0.418	0.128	0.002	-0.676; -0.160
			Post-test	-0.345	0.109	0.003	-0.565; -0.126
Satisfaction	Intervention	Post-test	Pre-test	0.564	0.131	< 0.001	0.299; 0.828
		Follow-up	Pre-test	0.382	0.176	0.035	0.027; 0.736
			Post-test	-0.182	0.107	0.098	-0.398; 0.035
	Control	Post-test	Pre-test	0.000	0.131	1.000	-0.265; 0.265
		Follow-up	Pre-test	-0.255	0.176	0.155	-0.609; 0.100
			Post-test	-0.255	0.107	0.022	-0.471; -0.038
Total score of FSFI	Intervention	Post-test	Pre-test	2.173	0.461	< 0.001	1.243; 3.102
		Follow-up	Pre-test	1.300	0.639	0.048	0.011; 2.589
			Post-test	-0.873	0.486	0.080	-1.854; 0.108
	Control	Post-test	Pre-test	-0.168	0.461	0.717	-1.098; 0.761
		Follow-up	Pre-test	-1.327	0.639	0.044	-2.616; -0.038
			Post-test	-1.159	0.486	0.022	-2.140; -0.178

The statistical test used is follow-up LSD test

$P < 0.05$ is significant

in Alimohammadi et al.), raising the score beyond that point becomes challenging [52]. Studies have shown that individuals with high self-efficacy have confidence in their abilities and focus on their tasks [53]. On the other hand, counseling covers not only the cognitive and emotional domains but also the behavioral domain related to decision-making and performing a behavior [54]. Considering these two aspects, efforts were made to create motivation for patients to engage in orgasm-related exercises through counseling and enhancing self-efficacy. Studies have shown that the number of times reaching orgasm in each sexual relationship is related to sexual satisfaction [55]. Therefore, it can be said that the reason for the impact of the present study on sexual satisfaction may be related to orgasm.

Regarding the analysis of research hypotheses, the results indicated that the intervention had no effect on sexual desire and pain during intimacy, consistent with Saboula et al. [35] regarding the lack of impact on sexual desire and Bagherzadeh et al. [46] regarding the lack of effect on pain during intimacy. However, these findings contradict those of Alimohammadi et al. [32] and Marvi et al. [47]. Concerning sexual desire, it can be said that reduced self-confidence due to physical changes and anxiety are two significant factors reducing it in women with breast cancer [56, 57]. In the current study, efforts were made to increase patients' self-confidence using the self-efficacy theory to reduce their anxiety, allowing them to feel capable and skilled in establishing desirable sexual relationships, leading to an increase in their sexual desire. Nevertheless, changes in the scores of this domain were not significant at any time or in any group. Perhaps the reason for this could be the non-disclosure of sexual desires by patients due to Iranian culture. In Iranian culture, women often believe that sexual requests and expressions of desire should come from men, and women expressing them is taboo, leading women to suppress or not express their sexual desires [58]. Since sexual desire emerges with arousal, which is closely related to it [59], and the intervention improved the arousal domain, this hypothesis gains strength. Regarding pain during intimacy, although multiple studies have shown that increased self-efficacy leads to coping with chronic pain and its effect on chronic pain conditions such as pain from multiple sclerosis is confirmed [60], this domain did not change in the present study. This could be attributed to the limitations of the research tools used [61]. The Female Sexual Function Index measures the presence of pain rather than its intensity and severity. Perhaps using a tool that measures the intensity of pain

Table 5 Mean changes comparisons of total sexual function and its domain between intervention and control groups

Variable	Time	Group				Z	*P* value
		Intervention		Control			
		Mean	SD	Mean	SD		
Desire	Post-test −pre-test	0.27	0.78	-0.10	0.62	-1.943	0.052
	follow-up—pre-test	-0.03	0.80	-0.22	0.94	-1.007	0.314
	follow-up—post-test	-0.30	0.55	-0.16	0.62	-0.641	0.522
Arousal	post-test −pre-test	0.44	0.58	-0.07	0.29	-3.758	< 0.001
	follow-up—pre-test	0.30	0.73	-0.27	0.63	-2.742	0.006
	follow-up—post-test	-0.14	0.41	-0.22	0.59	-0.736	0.461
Lubrication	post-test −pre-test	0.35	0.69	-0.01	0.37	-2.053	0.040
	follow-up—pre-test	0.30	0.65	-0.11	0.79	-2.062	0.039
	follow-up—post-test	-0.05	0.37	-0.07	0.67	-0.145	0.885
Orgasm	post-test −pre-test	0.27	0.54	-0.07	0.35	-2.167	0.030
	follow-up—pre-test	0.07	0.66	-0.42	0.53	-2.531	0.011
	follow-up—post-test	-0.20	0.37	-0.35	0.62	-0.753	0.451
Satisfaction	post-test −pre-test	0.56	0.67	-0.02	0.55	-2.964	0.003
	follow-up—pre-test	0.38	0.93	-0.25	0.70	-2.174	0.030
	follow-up—post-test	-0.18	0.50	-0.25	0.50	-0.879	0.379
Pain	post-test −pre-test	0.27	0.58	0.07	0.35	-1.129	0.259
	follow-up—pre-test	0.27	0.69	-0.05	1.30	-0.881	0.379
	follow-up—post-test	0.00	0.21	-0.11	1.33	-0.745	0.456
Total FSFI	post-test −pre-test	2.17	2.77	-0.20	1.28	-3.783	< 0.001
	follow-up—pre-test	1.30	2.92	-1.33	3.07	-2.924	0.003
	follow-up—post-test	-0.87	1.24	-1.16	2.97	-0.717	0.474

The statistical test used is Mann-Whitney

P < 0.05 is significant

could demonstrate the impact of the intervention on pain management [62]. In the control group, the overall FSFI score and most of its domains showed a decreasing trend, which is consistent with the findings of Bagherzadeh et al. [46]. This can be explained as follows: If effective psychological interventions are not performed on breast cancer patients, their sexual performance will decrease.

Considering the decrease in self-efficacy in women with breast cancer and the role of self-efficacy in reducing negative emotions, coping with disease-related side effects, and improving patients' mental image, conducting counseling and educational interventions based on the self-efficacy theory for the first time in this population of patients can be a strength of this study. However, this study has several limitations. One of the limitations is the lack of participation of spouses in the research due to various reasons such as cultural issues, beliefs, and societal attitudes. Since sexual function depends on the performance of both partners, studies that include interventions for both partners may yield better results. Additionally, the samples in the present study were limited to a specific geographical region, with a small number of participants and on a voluntary and goal-based basis. These conditions make it necessary to approach the generalization of results with caution. The limited sample size may be a reason for some of the negative results of the study; therefore, it is recommended to replicate the research with a larger sample size. Furthermore, considering the limited follow-up period of one month, caution should be exercised in making statements about the long-term effects of this intervention.

Conclusion

Overall FSFI scores and most of its domains were higher in the intervention group compared to the control group, which can be attributed to the impact of sexual education and counseling. Although some findings were not statistically significant, the clinical significance of the results of this intervention is important. Strengthening self-efficacy beliefs related to sexual health can improve women's skills and self-confidence in facing sexual challenges and lead to sexual well-being. Given that general healthcare providers are typically the primary point of contact for BC patients and are responsible for initiating and overseeing treatment, it seems prudent to include sexual education and counseling based on self-efficacy theory in the in-service training program of these caregivers. This would enable them to use the intervention when providing care to women with breast cancer. Healthcare providers interacting with breast cancer patients in various stages of the disease, including diagnosis, treatment, and post-treatment rehabilitation, can use this method as an easy, cost-effective, and practical approach to enhance

the sexual quality of life of breast cancer patients alongside other medical interventions.

Given that the intervention had no effect on two areas of sexual performance, namely desire and pain during intercourse, qualitative studies may prove beneficial in elucidating the reasons for this lack of effect, with a particular focus on the area of desire. A further investigation of alternative interventions and a comparison of their effects on sexual performance, particularly in relation to desire and pain, may assist in identifying the most efficacious methods for enhancing sexual function. Furthermore, sexual function is a variable that is dependent on the performance of both partners. Consequently, investigations that consider the impact of interventions on both sexual partners may yield more comprehensive results.

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Author contributions
TG, FN and RB designed the study. Intervention and Data collection: AJ and TG. Data analysis: RB. AJ drafted the manuscript, and R.B. prepared the tables. TG, FN and RB read and edited for scientific accuracy and approved the final manuscript.

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Data availability
The anonymized datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
This paper was extracted from a master's degree thesis of the Faculty of Nursing and Midwifery, which was approved in 2023 and approved by the Ethics Committee of the Bushehr University of Medical Sciences, Bushehr, Iran, and from the IRCT code (IRCT20231102059930N1). All methods were carried out in accordance with the Declaration of Helsinki. Written informed consent was obtained from all individual participants included in the study.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

Note
This study adhered to the CONSORT guidelines.

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References

1. Alizadeh M, et al. Age at Diagnosis of Breast Cancer in Iran: A Systematic Review and Meta-Analysis. Iran J Public Health. 2021;50(8):1564–76.
2. Mohseni M, et al. A new therapeutic approach for the treatment of breast cancer using synthesis of liposomes containing silybinin and their characterization. New Cellularand Mol Biotechnol J. 2021;11(44):57–70.
3. Isfahani P, Hossieni Zare SM, Shamsaii M. The Prevalence of Depression in Iranian Women With Breast Cancer: A Meta-Analysis. Intern Med Today. 2020;26(2):170–81.
4. Asgarian F, et al. Epidemiology of Breast Cancer and the Age Distribution of Patients over a Period of Ten Years. Iran J Breast Dis. 2016;9(1):31–6.
5. Bagherzadeh R, et al. Effects of mindfulness-based stress reduction training on rumination in patients with breast cancer. BMC Womens Health. 2022;22(1):552.
6. Ussher JM, Perz J, Gilbert E. Perceived causes and consequences of sexual changes after cancer for women and men: a mixed method study. BMC Cancer. 2015;15:268.
7. Usta OY, Gokcol D. Sexual dysfunction in women with breast cancer receiving chemotherapy. Int J Caring Sci. 2017;10(3):1439–46.
8. Pedram Razi S, et al. The Effect of Education and Telephone Counseling On The Self- Efficacy Of Women With Breast Cancer Undergoing Radiotherapy. Iran J Nurs Res. 2018;13(1):64–72.
9. Masoudi Sani R, Pakniya N, Doroudian F. effectiveness of systemic-constructivist couple therapy on enhancement of marital satisfaction in women with breast cancer. Woman Stud Fam. 2017;9:55–69
10. Fazel A, et al. The effect of mastectomy on mood and quality of life in breast cancer patients. J Shahid Sadoughi Univ Med Sci Health Serv. 2008;16(3):28–36.
11. Zeyghami Mohammadi S, Ghafari F. Sexual dysfunction and its correlation with quality of life among women affected with cancer. Iran J Obstet Gynecol infertility. 2009;12(2):39–46.
12. Mohammadi N, et al. The relationship between self-efficacy and mental health in women with breast cancer referred to health centers in hamadan 2016–2017. Avicenna J Nurs midwifery care (scientific J hamadan Nurs midwifery faculty). 2018;26(2):72–81.
13. Nasiri F, et al. The effectiveness of spiritual care on the self-efficacy of women with breast cancer. Nurs Midwifery J. 2019;16(12):856–64.
14. Shoaa Kazemi M, Mehravar Momeni J. A Comparative Study On Self-Efficacy And Empowerment In Women With Breast Cancer And Healthy Women. Iran J Breast Dis. 2012;5(1):45–53.
15. BorjAlilu S, et al. Exploring the role of self-efficacy for coping with breast cancer: A systematic review. Archives Breast Cancer. 2017;4(2):42–57.
16. Ali R, et al. Self-Efficacy for Coping with Breast Cancer in North-Eastern State of Peninsular Malaysia. Asian Pac J Cancer Prev. 2020;21(10):2971–8.
17. Mansouri A, et al. Effect of Sexual Health Education Based on Health Belief and Pender Health Promotion Models on the Sexual Function of Females with Type II Diabetes. J Diabetes Nurs. 2020;8(1):992–1001.
18. Fourcroy JL. Female sexual dysfunction: potential for pharmacotherapy. Drugs. 2003;63(14):1445–57.
19. Panahi R, et al. The effect of women's sexual functioning on quality of their sexual life. J Prev Med Hyg. 2021;62(3):776–81.
20. Del Pup L, et al. Approach to sexual dysfunction in women with cancer. Int J Gynecologic Cancer. 2019;29(3):630–4.
21. Fouladi N, et al. The predictors of sexual satisfaction among Iranian women with breast cancer. Asian Pac J Cancer Prev. 2021;22(2):391–6.
22. Jaafarpour M, et al. Female sexual dysfunction: prevalence and risk factors. J Clin Diagn Res. 2013;7(12):2877–80.
23. Ghavami H, Sanadyzadeh M. Guide to diagnosis and treatment of sexual dysfunction in women and erectile dysfunction in men. Tehran: Talia; 2012. pp. 40–61.
24. Morteza H, et al. Relationship between marital and occupational satisfaction in the Iranian health center employees. Koomesh J. 2018;20(2):300–9.
25. Gholizadegan Rayat S, et al. Effectiveness of Psycho-Religious Sexuality Education upon Anger and Depression of Iranian Female Adolescents: The Relationship of Quality Family Relationships and Birth Order. J Relig Health. 2023;62(2):1070–89.
26. Zheng M-C, et al. Telephone follow-up for patients returning home with colostomies: views and experiences of patients and enterostomal nurses. Eur J Oncol Nurs. 2013;17(2):184–9.
27. Mahmodi G, Hassanzadeh R, Heidari G. The effect of sex education on family health on Mazandran medical university students. Intern Med Today. 2007;13(2):64–70.

28. Wegner SE, et al. Estimated savings from paid telephone consultations between subspecialists and primary care physicians. Pediatrics. 2008;122(6):e1136–40.
29. Ghahramani M, et al. Stages of pap smear screening change behavior based on TTM in women referring to health centers in Gonabad - years 1393. Mod Care J. 2015;11(4):304–15.
30. Kadivar P, Nemat Tavoosi M, Yousefi N. The relationship of review between cognitive learning styles and self-efficacy beliefs with achievement math. Journla Psychol researches. 2010;2(5):107–22.
31. Behnam Vashani HR, et al. Effect of storytelling on self-efficacy in children with thalassemia: Application of bandura s social cognitive theory. J health care. 2015;17(3):230–9.
32. Alimohammadi L, et al. The effectiveness of group counseling based on Bandura's self-efficacy theory on sexual function and sexual satisfaction in Iranian newlywed women: A randomized controlled trial. Appl Nurs Res. 2018;42:62–9.
33. Esmkhani M, et al. Comparison of the effects of the PLISSIT model versus the sexual health model on quality of life among women with breast cancer. Sex Disabil. 2021;39(1):85–96.
34. Jalambadani Z, Garmaroudi G, Tavousi M. Education based on theory of planned behavior over sexual function of women with breast cancer in Iran. Asia-Pacific J Oncol Nurs. 2018;5(2):201–7.
35. Saboula N, El-Sayed S. Effectiveness of application of PLISSIT counseling model on sexuality for breast cancer's women undergoing treatment. Am J Nurs Sci. 2015;4(4):218–30.
36. Shahin MA, Gaafar HAA, Alqersh DLA. Effect of Nursing Counseling Guided by BETTER Model on Sexuality, Marital Satisfaction and Psychological Status among Breast Cancer Women. Translational Androl Urol. 2021;4(2):160–8.
37. Keshavarz Z, et al. The effect of PLISSIT based counseling model on sexual function, quality of life, and sexual distress in women surviving breast cancer: a single-group pretest–posttest trial. BMC Womens Health. 2021;21(1):1–8.
38. Heravi Karimoui M, et al. Effect of group counseling on sexual health of patients with breast cancer. Sci J Forensic Med. 2006;11(4):201–6.
39. Brezsnyak M, Whisman MA. Sexual desire and relationship functioning: The effects of marital satisfaction and power. J Sex Marital Ther. 2004;30(3):199–217.
40. Steinke EE, et al. A Social-Cognitive Sexual Counseling Intervention Post-MI—Development and Pilot Testing. Perspect Psychiatr Care. 2013;49(3):162–70.
41. Mohammadi K, Heydari M, Faghihzadeh S. The female sexual function index (FSFI): validation of the Iranian version. Payesh. 2008;7(3):269–72.
42. Bagherzadeh R, Sohrabineghad R, Vahedparast H. Comparison of Sexual Dysfunction Between Women with Breast Cancer and Healthy Women in Bushehr. Iran J Breast Dis. 2020;13(3):20–9.
43. https://irct.behdasht.gov.ir/trial/73532
44. Shalamzari KH, et al. Comparing the effect of sexual counseling based on BETTER and PLISSIT models on sexual assertiveness in women with breast cancer after mastectomy. J Educ Health Promot. 2024;13:55.
45. Zangeneh S, et al. Effectiveness of online sexual education based on the extended PLISSIT model on sexual function and sexual satisfaction in women undergoing breast cancer treatment. J Educ Health Promot. 2023;12:311.
46. Bagherzadeh R, et al. Effect of mindfulness-based stress reduction training on revealing sexual function in Iranian women with breast cancer. Sex Disabil. 2021;39:67–83.
47. Marvi N, et al. The Effect of Sexual Education based on Sexual Health Model on the Sexual Function of Women with Infertility. Iran J Nurs Midwifery Res. 2019;24(6):444–50.
48. Lester J, et al. Atrophic vaginitis in breast cancer survivors: a difficult survivorship issue. J Pers Med. 2015;5(2):50–66.
49. Boswell EN, Dizon DS. Breast cancer and sexual function. Translational Androl Urol. 2015;4(2):160.
50. Masoomi SZ, et al. Investigating the effects of sexual consultation on marital satisfaction among the pregnant women coming to the health centers in the city of Malayer in the year 1394. Avicenna J Nurs Midwifery Care. 2016;24(4):256–63.
51. Rahmanian SA, Khadivzadeh T, Esmaily H. Comparison of the effect of group counseling and integrated counseling (group and individual) on sexual knowledge and attitude in women on the verge of marriage. Iran J Obstet Gynecol Infertility. 2017;20(3):77–88.
52. Liu Q, Wang L. t-Test and ANOVA for data with ceiling and/or floor effects. Behav Res Methods. 2021;53(1):264–77.
53. Yousefzadeh MR, Yaghoobi A, Rashidi M. The impact of metacognition skills instruction on secondary school girl students' self-efficacy. J Sch Psychol. 2012;1(3):118–34.
54. Mofarehe S. The effect of counseling on couple's sexual satisfaction in Shiraz. Presented for the M. Sc., Tehran. Iran University of Medical Sciences; 2002.
55. Greenberg JS, Bruess CE, Oswalt SB. Exploring the dimensions of human sexuality. Jones & Bartlett; 2014.
56. Goetter EM. An empirical investigation of depressive rumination: implications for cognitive flexibility. Problem Solving and Depression; 2010.
57. shayan a, et al. The relationship between sexual function and mental health of women with breast cancer. Avicenna J Nurs Midwifery Care. 2016;24(4):221–8.
58. Bagherzadeh R, et al. Prevalence of Female Sexual Dysfunction and Related Factors for Under Treatment in Bushehrian Women of Iran. Sex Disabil. 2010;28(1):39–49.
59. Basson R. The female sexual response: a different model. J sex marital therapy. 2000;26(1):51–65.
60. Ensandoost T, et al. The Effectiveness of Acceptance and Commitment based Therapy on Pain Perception and Pain Self-Efficacy in Patients with Chronic Musculoskeletal Pain. Iran J Rehabilitation Res Nurs. 2021;8(1):25–34.
61. Siegel RL, Miller KD, Jemal A. *Cancer statistics*, 2019. CA: a cancer journal for clinicians, 2019. 69(1): pp. 7–34.
62. Brotto LA, Basson R. Group mindfulness-based therapy significantly improves sexual desire in women. Behav Res Ther. 2014;57:43–54.

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