



Effects of Therapeutic-Supportive Interventions on Sexual Satisfaction and Function in Women with Breast Cancer: A Systematic Review

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Abstract

Context: Breast cancer in women can cause sexual dissatisfaction and hinder sexual function as a result of treatment processes. Several studies have been conducted on the impact of therapeutic-supportive interventions on sexual satisfaction and performance; nonetheless, contradictory results have been reported. The aim of this systematic review and meta-analysis was to review the effects of therapeutic-supportive interventions on sexual satisfaction and function in patients with breast cancer. In this study, a quality assessment of published articles was also conducted.

Evidence Acquisition: In this systematic review, electronic databases, including Google Scholar, Web of Sciences, Science Direct, Cochrane Library, ProQuest, Scopus, and PubMed (including Medline), were searched to retrieve articles published between 1990 and 2016. The articles were screened with regard to breast cancer in 4 stages. Articles, which focused on therapeutic-supportive interventions and sexual satisfaction and function of patients with breast cancer, were included in the study. According to the heterogeneity index between articles (Cochran's Q and I square tests), the random effects model, inverse variance weighting method, and standardized Cohen's statistics were applied to estimate the mean differences in sexual function and satisfaction.

Results: Six articles studied the effects of therapeutic-supportive interventions on sexual satisfaction, while 8 articles assessed the effects of these interventions on sexual function in patients with breast cancer. The standardized mean difference of sexual satisfaction between the intervention and control groups was -0.03 (95% CI, -0.55 - 0.49). In addition, the standardized mean difference of sexual function between the intervention and control groups was 0.14 (95% CI, -0.28 - 0.57).

Conclusions: The results showed that therapeutic-supportive interventions had no impact on the sexual satisfaction and function of patients with breast cancer.

Keywords: Breast Cancer, Sexual Function, Sexual Satisfaction, Therapeutic-Supportive Interventions

1. Context

Breast cancer is the most common cancer among women around the world (1-4) and is considered the second leading cause of mortality worldwide. Over the past 13 years, various efforts have been made to improve early detection, treatment, and alleviation of complications (5, 6). As a result of these efforts, the relative 5-year survival of patients from high-, middle-, and low-income countries has reached 80% - 90%, 60%, and 40%, respectively (7). However, diagnosis of breast cancer (8), chemotherapy (9), mas-

tectomy (10), surgery (6, 9), radiotherapy (6), and mental problems (11) have many negative consequences for breast cancer patients.

Physical problems can lead to sexual dysfunction and dissatisfaction. Sexual function is defined as one's anatomical and physiological capacity to engage in sexual activities. The components of sexual physiology include the sexual response cycle, human anatomy, and changes in the level of sex hormones and sexual life cycles as components of sexual anatomy (12), which are associated with softening of the vagina, frequency of sexual activity, and breast

tenderness. Prior to the diagnosis and treatment of breast cancer, sexual dysfunction was not reported in 91.5% of patients (6). The prevalence of sexual complications was estimated at 30% - 100% using previous treatments and included decreased libido, sexual arousal, and vaginal lubrication, followed by dyspareunia and vaginal dryness (6, 13-15).

On the other hand, sexual satisfaction refers to one's feelings about her body, sexual satisfaction, and even body image, and femininity (16). Since breast cancer causes common problems for couples (17), and sexual dissatisfaction compromises the marital life (9), healthcare providers, with the use of therapeutic-supportive interventions, can reduce sexual problems. In fact, support groups can help reduce stress and increase awareness about breast cancer, diet, healthy behaviors, and coping strategies. It has been reported that women who receive supportive care experience lower levels of distress (18). In a study on the effects of group counseling on the quality of sexual life, patients reported improvements in the quality of life in terms of sexuality, knowledge, and anxiety (15). However, an interventional study showed that sexual function and pleasure reduced within a week after the intervention, as quality of life and fatigue were mainly affected in patients (19).

There are contradictory results in previous studies regarding the effects of therapeutic-supportive interventions on the sexual satisfaction and function of women with breast cancer (20, 21). Systematic reviews can overcome the contradictions and ambiguities in the findings of original studies (22, 23). These studies can facilitate an accurate analysis of the impact of therapeutic-supportive interventions on sexual satisfaction and function. Therefore, by retrieving and investigating the literature, the present systematic review aimed to study the effects of therapeutic-supportive interventions on the sexual satisfaction and function of patients with breast cancer.

2. Evidence Acquisition

The keywords in the search process included "breast cancer", "interventions", "support programs", "cognitive behavioral therapy", "group counseling", "Internet-based interventions", "telephone intervention", "sexual satisfaction", and "sexual function". The following steps were taken to select the articles and conduct the systematic review and meta-analysis: 1) identification of the research question; 2) search in databases for retrieving articles; 3) selection of articles; and 4) presentation of data in charts and tables (17, 24) (Figure 1).

2.1. Identification of the Research Question and PICOD

The research questions were as follows:

- What are the therapeutic-supportive interventions for sexual function in patients with breast cancer?

- What are the therapeutic-supportive interventions for sexual satisfaction in patients with breast cancer?

PICOD refers to patients with breast cancer (P), therapeutic-supportive interventions (C), effect of intervention (O), and meta-analysis (D).

2.2. Search in Databases for Retrieving Articles

Electronic databases, including Google Scholar, Web of Sciences, Science Direct, Cochrane library, ProQuest, Scopus, and PubMed (including Medline) were searched for articles, using Medical Subject Headings (MeSH) and combinations of keywords, including "breast cancer", "breast neoplasm", "tumor", "intervention program", "education", "sexual function", "sexual dysfunction", and "sexual satisfaction" with Boolean operators. The articles were published between 1990 and 2016. Also, a manual search was conducted to find articles on supportive interventions, cognitive behavioral therapy, Internet-based interventions, telephone interventions, sexual education, and peer support.

2.3. Selection of Articles

The articles were screened with regard to breast cancer in 4 stages: 1) screening for the selection of titles; 2) removing duplicate papers; 3) comparison of abstracts with the study objectives; and 4) appraisal of the full-texts of articles.

2.3.1. Inclusion Criteria

Articles, which focused on therapeutic-supportive interventions, as well as sexual satisfaction and function in patients with breast cancer, were included in the study.

2.3.2. Exclusion Criteria

Case-control and cross-sectional studies, along with articles focusing on other types of cancer or variables other than sexual satisfaction and function, were excluded from the analysis.

2.4. Quality Assessment

Two authors evaluated the studies, based on the Jadad quality assessment scale from a previous systematic review (25, 26). The checklist consisted of 3 direct items, which focused on random allocation, blinding, and withdrawal. In addition, the checklist incorporated 8 indirect items: 1) explaining the study objectives; 2) describing the findings; 3) describing the inclusion and exclusion criteria; 4) identifying the sample size; 5) explaining the intervention; 6) including at least 1 control group; 7) considering the intervention effects; and 8) explaining the statistical analysis.

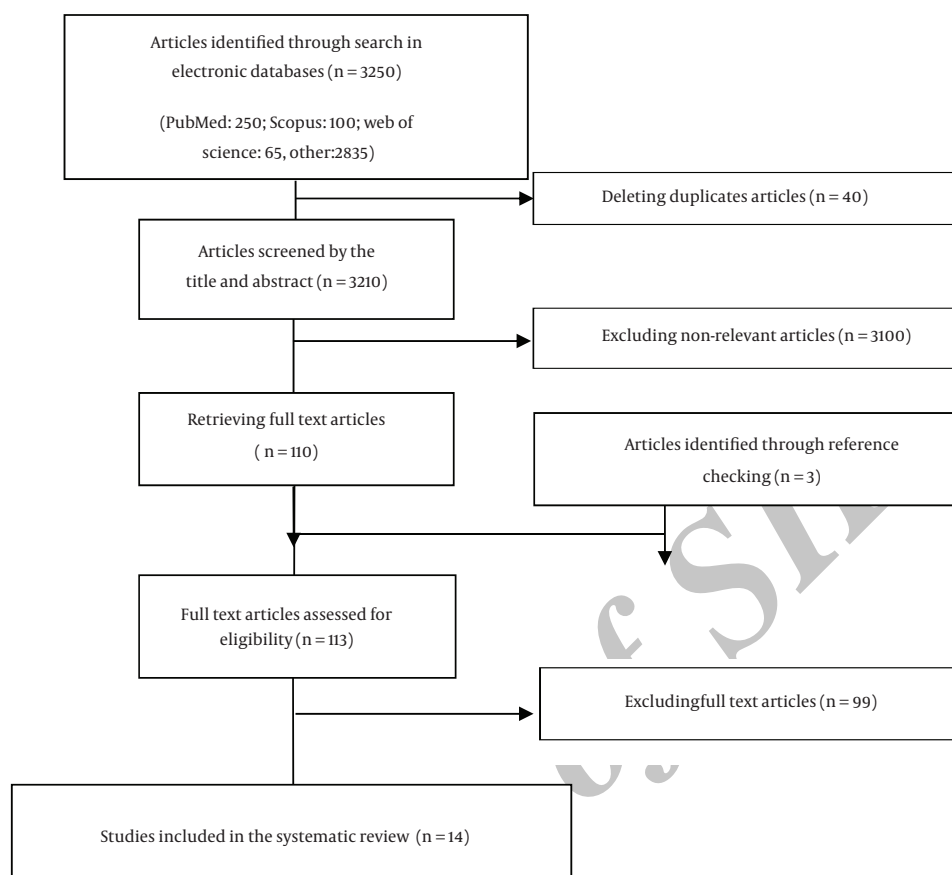


Figure 1. The Search Process in the Present Study

Various studies used the direct items, while some used both direct and indirect items. Most articles used the direct items, as they have been used in all areas of applied sciences. In this study, for surveying all items, we used both direct and indirect items. The scoring system ranged from 0 to 2 for direct items and 0 to 1 for the indirect ones. Regarding the direct items, articles were scored 2 if considered eligible in comparison with the total items; they were scored 1 or 0 if they showed average or zero quality, respectively. On the other hand, the indirect items were scored 1 or 0. Finally, the score of items was calculated (score ≥ 3 , good quality).

2.5. Data Extraction

The characteristics of each study, including title, authors, date and place of study, sample size, sampling method, age, type of intervention, and effect of intervention (mean and standard deviation), were determined (Tables 1-3).

2.6. Data Synthesis

Data analysis was carried out using Stata version 11. The heterogeneity index for the studies was calculated using Cochran's Q and I square tests. According to the heterogeneity index among articles, the random effects model, inverse variance weighting method, and standardized Cohen statistics were applied to determine the differences in the mean values of sexual function and satisfaction.

The point-standardized difference in the mean score of sexual satisfaction and function was estimated with 95% confidence interval (forest plots). In the graph, the size of cubic and surrounding lines indicated the weight of each article and 95% CI, respectively. Also, the Egger's test was used to assess the publication bias. P value < 0.01 was considered statistically significant.

3. Results

In different stages of the study, 40 out of 3,250 articles were removed due to duplication. Also, 3100 other articles

Table 1. Characteristics of Studies Included in the Systematic Review

Authors	Publication Year	Country	Sample Size	Type of Intervention	Data Collection Tool	Results
Bjorneklett	2013	Sweden	362	Support group	EORTC QLQ-C30; QLQ-BR23; HAD-FQ	The support intervention significantly improved cognitive function.
Rowland	2009	USA	155	Psychoeducational group	CES-D; RDAS; CARES	The intervention group was more likely to report improvement in relationship adjustment and communication, as well as increased sexual satisfaction, compared to the controls.
Heravi	2006	Iran	144	Group counseling	QLQ-BR23	Counseling improved sexual satisfaction and function.
Schover	2006	USA	48	Peer counseling	FACIT-Sp; FSFI; demographic and medical history; BSI-18	The program had positive effects.
Lotfi Kashani	2014	Iran	25	Sexual skills	ASEX	Sexual skill training improved sexual function and enhanced sexual satisfaction among patients with breast cancer.
Schover	2011	USA	291184 = 12-month follow-up	Peer counseling	FACIT-Sp; A-DAS; BSI-18; FSFI	Sexually active women had improved sexual function in the 6-month follow-up, but not after 1 year.
Young Jun	2011	Korea	45	Sexual life reframing program	CARES; sexual function (sexual interest, dysfunction, and satisfaction)	The sexual life reframing program was effective in increasing sexual satisfaction among breast cancer survivors.
Shariati	2010	Iran	25	Benson's relaxation intervention	Demographic questionnaire; BR23-C; quality of life questionnaire	The intervention improved sexual satisfaction and function.
Salonen	2009	Finland	228	Telephone intervention	QLI-CV; EORTC QLQ-BR23	The patients' experiences showed that the telephone intervention was helpful.

were excluded due to the following reasons: 1) being unrelated to the study objectives; and 2) performing no intervention affecting the variables. In the third stage, 110 studies were excluded, and 3 articles were found, based on the reference check. In the fourth stage, the full-text of 113 articles was read, and 99 articles were excluded. Finally, 14 articles were included in our systematic review and meta-analysis.

The articles, published between 2006 and 2016, were classified into "sexual satisfaction" and "sexual function". The samples were collected from women with breast cancer (age range, 18 - 65 years) during 2011 - 2013. Regarding sexual satisfaction, the intervention and control groups included 376 and 430 subjects, respectively. Among 6

articles related to sexual satisfaction, two had a quasi-experimental design, while 4 articles were randomized controlled trials. The randomization method was applied in all studies for the allocation of patients to the control and intervention groups. Sexual interventions for sexual satisfaction consisted of group counseling, peer support, group support, skill training programs, and psychological sex education. The interventions continued for 1 to 12 weeks.

Regarding sexual function, the intervention and control groups consisted of 665 and 666 women, respectively. Among 8 articles related to sexual function, four had a quasi-experimental design, while 4 articles had a randomized controlled design. Also, the randomization method

Table 2. Characteristics of the Excluded Studies

Authors/Publication Year	Article Title	Cause of Exclusion
Duijts, 2009 (27)	Cognitive behavioral therapy and physical exercise for climacteric symptoms in breast cancer patients experiencing treatment-induced menopause	Unrelated to sexual function
Hummel, 2015 (13)	Internet-based cognitive behavioral therapy for sexual dysfunction in women treated for breast cancer	Unrelated to sexual function
Hoey, 2008 (28)	Systematic review of peer-support programs for people with cancer	Systematic review
Broto, 2008 (29)	A psychoeducational intervention for sexual dysfunction in women with gynecologic cancer	Gynecologic cancer
Morone, 2014 (30)	Effects of a multidisciplinary educational rehabilitative intervention in breast cancer survivors: The role of body image on quality of life outcomes	Unrelated to sexual function
Malary, 2015 (31)	Biopsychosocial determinants of hypoactive sexual desire in women	Unrelated to sexual function
Pomery, 2015 (32)	Skills, knowledge, and attributes of support group leaders	Systematic review
Alpers, 2005 (33)	Evaluation of computerized text analysis in an Internet breast cancer support group	Unrelated to sexual function
Rezaei, 2016 (17)	Factors influencing body image in women with breast cancer	Narrative review

was used for the allocation of samples to the groups. The intervention programs consisted of group counseling, peer group, relaxation, telephone support, group support, skill training programs, and sex education programs. Also, the sexual function questionnaires were used for data collection in all studies.

Among the selected articles, six examined the effects of educational interventions on sexual satisfaction among women with breast cancer. The total sample size included 376 and 430 women in the intervention and control groups, respectively. In 3 studies, the mean of changes in

sexual satisfaction was higher in the intervention group, compared to the controls, and the difference was statistically significant.

There were heterogeneities between the results of retrieved articles (I-square, 90.9%; Q, 55.2; $P < 0.05$). Therefore, the random effects model was used to estimate the standardized mean differences of sexual satisfaction scores. The standardized mean difference of sexual satisfaction between the intervention and control groups was -0.03 (95% CI, -0.55 - 0.49). In fact, the score of sexual satisfaction in the intervention group was -0.03 lower than that of the control group; however, the difference was not statistically significant (Figure 2).

Eight studies examined the effect of education on sexual function in women with breast cancer. The population of the intervention and control groups included 665 and 666 women, respectively. Five studies reported greater mean changes in sexual function in the intervention group; nonetheless, only 1 study showed a significance change.

There were heterogeneities between the studies (I-square, 92.4%; Q, 92.6; $P < 0.01$). Therefore, the random effects model was used to estimate the standardized mean differences of sexual function scores. The standardized mean difference of sexual function score was 0.14 between the intervention and control groups (95% CI, -0.28 - 0.57). Accordingly, the score of sexual function in the intervention group was 0.14 higher than that of the control group; the difference was not statistically significant (Figure 3).

In addition, quality assessment of articles on sexual function and satisfaction (Tables 4 and 5) showed that 62.5% and 66.66% of articles used random methods, while 12.5% and 16.67% focused on description of this approach, respectively. The greatest shortcomings of the articles were related to the double-blind design and full description of sample loss. In fact, 25% and 33.33% of studies related to sexual performance and satisfaction presented a full description of the cause of sample loss, respectively.

The survey of 8 indirect items showed that 100% of articles related to sexual function explained the study objectives, results, inclusion and exclusion criteria, and sample size, which are strengths of these studies. Also, 100% of articles related to sexual satisfaction explained the study objectives and results and included at least 1 control group with complete scores.

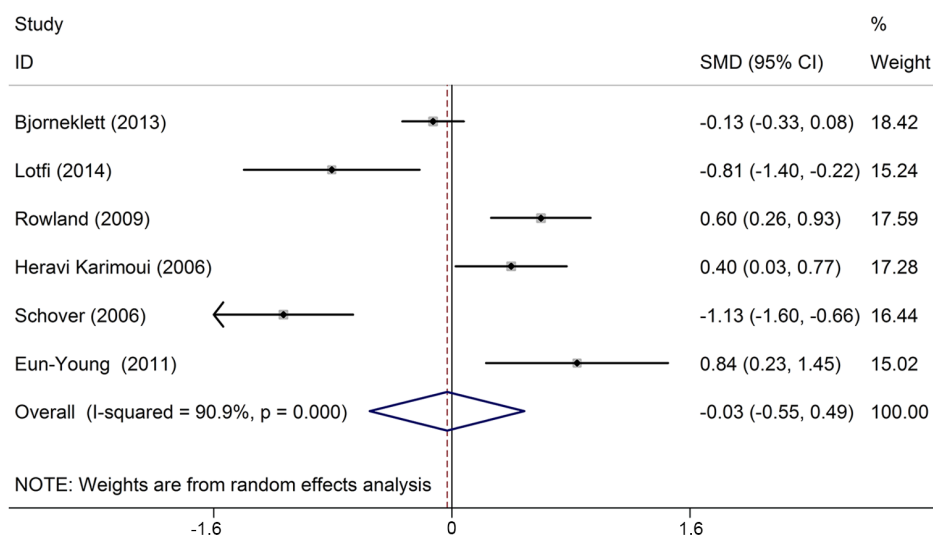
4. Discussion

This meta-analysis aimed to investigate the effects of therapeutic-supportive interventions on the sexual satisfaction and function of patients with breast cancer in a systematic review. The findings showed that the scores of sex-

Table 3. The Demographic Characteristics of Patients in Studies Included in the Systematic Review

First Author	Publication Year	Type of Outcome	Sample Size		Intervention Group ^a	Control Group ^a
			Intervention Group	Control Group		
Bjorneklett	2013	Sexual satisfaction	181	181	64.4 ± 25.3	67.7 ± 26.5
Lotfi	2014	Sexual satisfaction	24	24	3.58 ± 0.997	4.25 ± 0.621
Rowland	2009	Sexual satisfaction	57	98	4.8 ± 1.1	4.4 ± 0.1
Heravi Karimoui	2006	Sexual satisfaction	51	63	12.19 ± 16.15	7.72 ± 4.14
Schover	2006	Sexual satisfaction	41	41	3.26 ± 1.88	5.04 ± 1.19
Eun-Young	2011	Sexual satisfaction	22	23	47.16 ± 9.49	38.96 ± 10.02
Schover	2006	Sexual function	47	47	17.85 ± 11.57	30.75 ± 4.8
Schover	2011	Sexual function	184	184	18.1 ± 10.7	18.2 ± 10.7
Lotfi	2014	Sexual function	35	35	42.41 ± 14.178	34.56 ± 11.803
Eun-Young	2011	Sexual function	22	23	1.37 ± 0.87	1.53 ± 0.73
Shariati	2010	Sexual function	25	25	24 ± 20.4	17.3 ± 17
Salonen	2009	Sexual function	120	108	29 ± 26	24 ± 22
Bjorneklett	2013	Sexual function	181	181	24.2 ± 23.9	19.9 ± 23
HeraviKarimoui	2006	Sexual function	51	63	25.19 ± 11.78	8.52 ± 11.48

^aValues are expressed as mean score ± SD.

**Figure 2.** The Standardized Mean Difference of Sexual Satisfaction Between the Intervention and Control Groups

ual function and satisfaction were 0.14 and -0.03, respectively.

Two studies from Korea and Sweden assessed the effects of interventional programs in patients with breast cancer (19, 21). In the study from Sweden, among 382 patients with breast cancer, 191 cases participated in a supportive intervention for 1 week. The intervention included

presentation of information on the etiology of cancer, risk factors, physical and psychological consequences, and coping strategies, using lectures and group discussions. Also, physical exercises, such as relaxation, Qigong, nonverbal communication, and art/dance therapy, were included in the intervention. Data were collected before the intervention and 2, 6, and 12 months after the intervention.

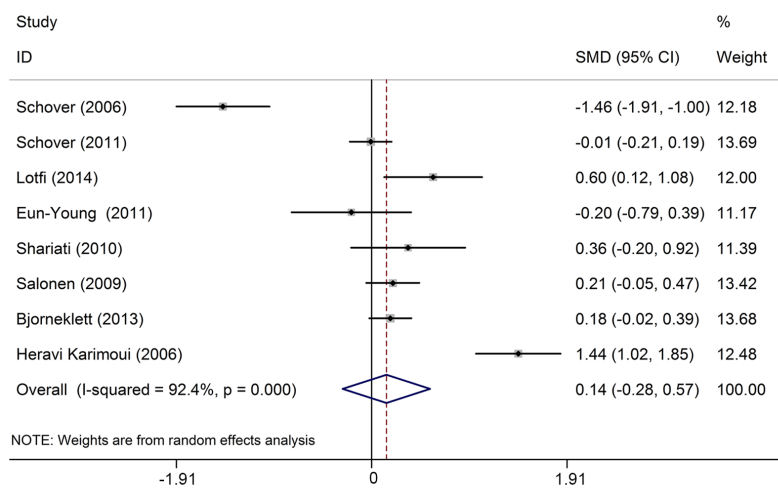


Figure 3. The Standardized Mean Difference of Sexual Function Scores Between the Intervention and Control Groups

Table 4. Quality Assessment of Articles Related to Sexual Function

Items	Score	No. (%)
Direct Items		
1. Was the study described as randomized?	0	2 (25)
	1	5 (62.5)
	2	1 (12.5)
2. Was the study described as double-blind?	0	8 (100)
	1	-
3. Was there a description of withdrawals and dropouts?	0	6 (75)
	0.5	-
	1	2 (25)
Indirect items		
4. Were the study objectives defined?	0	-
	1	8 (100)
5. Were the outcome measures defined clearly?	0	-
	1	8 (100)
6. Was there a clear description of the inclusion and exclusion criteria?	0	-
	1	8 (100)
7. Was the sample size justified?	0	-
	1	8 (100)
8. Was there a clear description of the interventions?	0	1 (12.5)
	1	7 (87.5)
9. Was there at least 1 control (comparison) group?	0	1 (12.5)
	1	7 (87.5)
10. Was the assessment method of adverse effects described?	0	8 (100)
	1	-
11. Were the methods of statistical analysis described?	0	1 (12.5)
	1	7 (87.5)

In the mentioned study, quality of life dimensions, such as bodily pain, physical function, and sexual satisfaction, were measured, using the short-form health survey

(SF-36). It was reported that sexual function and satisfaction reduced after the intervention. Therefore, the intervention influenced the patients' quality of life and fatigue

Table 5. Quality Assessment of Articles Related to Sexual Satisfaction

Items	Score	No. (%)
Direct Items		
	0	1 (16.67)
1. Was the study described as randomized?	1	4 (66.66)
	2	1 (16.67)
	0	6 (100)
2. Was the study described as double-blind?	1	-
	2	-
	0	4 (66.67)
3. Was there a description of withdrawals and drop outs?	0.5	-
	1	2 (33.33)
Indirect items		
4. Were the study objectives defined?	0	-
	1	6 (100)
5. Were the outcome measures defined clearly?	0	-
	1	6 (100)
6. Was there a clear description of the inclusion and exclusion criteria?	0	1 (16.67)
	1	5 (83.33)
7. Was the sample size justified?	0	1 (16.67)
	1	5 (83.33)
8. Was there a clear description of the interventions?	0	1 (16.67)
	1	5 (83.33)
9. Was there at least 1 control (comparison) group?	0	-
	1	6 (100)
10. Was the assessment method of adverse effects described?	0	6 (100)
	1	-
11. Were the methods of statistical analysis described?	0	-
	1	6 (100)

(19). Moreover, the study from Korea focused on education about sexual issues. The findings showed an improvement in the sexual satisfaction of 22 patients ($P < 0.01$) (21).

Moreover, two studies from Iran and the United States used group and peer counseling (15, 34). In the study from Iran, group discussion involved 114 patients with breast cancer, 51 of whom participated in group discussions (4 - 5 patients per group). Five group discussions were held for 1.5 hours and focused on disease education, knowledge of treatments, consequences of chemotherapy, and effects of intervention on sexual organs. Patients were asked to apply their learning to their daily life over 3 months. The results showed an improvement in sexual satisfaction and function ($P < 0.001$) (15).

In the study from the United States, 48 patients

participated in the peer-counseling intervention about menopause and cancer (including hot flashes, vaginal dryness, urinary incontinence, and prevention of fungal urinary tract infections), breast cancer and sexual issues (talking to the partner, resuming sex after cancer, and dyspareunia), and cancer and family (reproductive and breast cancer, family history of breast cancer, genetic counseling, and screening). The intervention was held in 3 sessions (30 - 60 minutes per session). The findings showed improvements in the knowledge of sexual function and satisfaction, stress, and menopause, based on the scores of the sexual function questionnaire. The SPIRIT program could increase the knowledge of patients ($P < 0.001$).

In another study from the United States, the psychoeducational group intervention was implemented with a focus on understanding sexuality and intimacy in patients with breast cancer. The inclusion criteria were diagnosis of breast cancer (stage 0 - II), established diagnosis for 1 - 5 years, tamoxifen treatment, no history of other diseases or skin involvement, and proficiency in English language. Patients from different age groups were included in this study. Among 284 subjects, 57 and 98 were assigned to the intervention and control groups, respectively; the duration of intervention was 6 weeks. Four months after the intervention, the data collection tool was applied. The intervention focused on lectures about breast and sexuality for cancer patients and survivors. Based on the findings, after the intervention, the patients felt comfortable about being naked and touched during sexual activities; in other words, patients reached sexual satisfaction and comfort (35).

Moreover, in an interventional study from Iran, 35 patients with breast cancer, aged below 60 years, received education on sexual skills for 12 sessions (90 minutes per session). The findings showed an improvement in the sexual satisfaction of the intervention group (0.997 ± 5.25), compared with the controls (0.621 ± 4.25). Also, similar improvements were reported in the sexual function of both groups (intervention, 1.115 ± 15.83 vs. control, 1.055 ± 20.25) (20).

In conclusion, the present study investigated the effects of therapeutic-supportive interventions on the sexual function and satisfaction of patients with breast cancer. Based on the findings, age, social status, and economic condition affect sexual issues. Also, perceived differences and marital discords influence sexual problems. However, the findings of this study did not show any significant differences between the type of intervention and sexual satisfaction and function. A probable reason is the type of counseling intervention and supportive method. Lack of homogeneity in the applied tools and scales can be also effective. Furthermore, the social context, culture, and partner sup-

port may affect sexual issues in women. Overall, systematic analysis of the literature can be helpful in knowledge production, improvement of shortcomings and defects, and design of optimal plans.

4.1. Strengths

In this systematic review and meta-analysis, the authors incorporated all interventions influencing sexual function and satisfaction in patients with cancer.

4.2. Limitations

The limitations of this study include focus on 2 languages and lack of access to the full-text of some abstracts.

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Footnotes

Authors' Contribution: All authors contributed to the design of the study, writing of the manuscript, and final approval for publication.

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Application in Research: Since sexual satisfaction is an important part of marital life, future researchers need to evaluate the effects of various educational programs with consideration of culture and context.

Application in Practice: The findings of this study can help healthcare providers assess the effects of therapeutic-supportive interventions, applied alongside other treatment modalities, which have negative effects on the physical and psychological health of patients. Also, they can help patients cope with cancer and improve their knowledge of sexual, physical, and psychological aspects of cancer, which influence their quality of life.

Ethical Code: Decree number, 229/95; IR.MAZUMS.REC.95.S.123.

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