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Effectiveness of online sexual education based on the extended PLISSIT model on sexual function and sexual satisfaction in women undergoing breast cancer treatment

Sanaz Zangeneh, Mitra Savabi-Esfahani[1], Fariba Taleghani[2], Mohammad R. Sharbafchi[3], Mehrdad Salehi[4]

Student Research Committee, School of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran, [1]Department of Midwifery and Reproductive Health, Nursing and Midwifery Care Research Center, Faculty of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran, [2]Faculty of Nursing and Midwifery, Nursing and Midwifery Care Research Center, Isfahan University of Medical Sciences, Iran, [3]Department of Psychiatry, School of Medicine, Isfahan University of Medical Sciences, Omid Hospital, Iranian Cancer Control Center (MACSA), Isfahan, Iran, [4]Department of Psychiatry, Behavioral Sciences Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

Address for correspondence:
Dr. Mitra Savabi-Esfahani, Department of Midwifery and Reproductive Health, Nursing and Midwifery Care Research Center, Faculty of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran.
E-mail: M_savabi@nm.mui.ac.ir

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Abstract:

BACKGROUND: Despite therapeutic interventions having increased the survival rate of women with breast cancer, sexual dysfunction occurs in cancer survivors due to treatment. The aim of this study is to determine the effect of online sexual education, based on the Ex-PLISSIT model on sexual function and satisfaction, on women undergoing breast cancer treatment.

MATERIALS AND METHODS: The present study was a quasi-experimental and interventional control study. It was conducted with a pretest–posttest design between April and July 2022 in Isfahan, Iran. The participants were divided into an intervention (n = 40) and a control group (n = 40). The intervention group received sexual education based on the Ex-PLISSIT model that consisted of four levels of intervention, namely, permission (P), limited information (LI), specific suggestions (SS), and intensive therapy (IT), presented in four sessions. The Female Sexual Function Index (FSFI) and Larson's Sexual Satisfaction Questionnaire were used to measure the sexual function and sexual satisfaction of the participants. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 21. P values below 0.05 were considered statistically significant.

RESULTS: The results showed that the mean of sexual satisfaction and function scores in the intervention group significantly increased after intervention. Moreover, the results showed a statistically significant difference in the mean of sexual satisfaction scores between the intervention and control groups after intervention (P = 0.020). Although there was a difference between the mean of sexual function scores in the intervention and control groups after the intervention, the t-test showed no statistically significant difference (P = 0.176).

CONCLUSIONS: According to the results of the study, sexual education based on the Ex-PLISSIT model could effectively enhance sexual satisfaction of women undergoing breast cancer treatment. It seems that this model can help health care providers evaluate the sexual needs of the patients and provide appropriate suggestions in order to decrease sexual problems.

Keywords:

Breast cancer, online education, sexual function, sexual satisfaction

Introduction

Breast cancer is the most common cause of cancer-related death among women in developed countries and the second leading cause of death in developing countries.[1] Although the incidence rate of breast cancer among Iranian women is lower than those of developed countries, its incidence rate has increased in recent years

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especially among young women.[2] While therapeutic interventions have increased the survival rate of women with breast cancer, problems such as vaginal dryness, fatigue, and disturbances in body image following these interventions can disrupt women's sexual health.[3] The reported sexual problems among women with breast cancer include loss of desire, dyspareunia, vaginal atrophy, and decreased sexual pleasure.[4] Prevalence of sexual problems among women with breast cancer is 40% to 80%.[3,5] In many cultures and societies, the loss of breasts often means the loss of femininity and sexual attractiveness.[6] Damage to the sexual organs in women also causes mood disorders such as depression and anxiety.[7] Sexual and mental problems caused by the diagnosis and treatment of breast cancer also affect marital relationships.[8–10] Today, despite the increasing number of women with breast cancer, advanced breast cancer treatments have increased the survival rate of breast cancer patients to about 90%. However, cancer survivors still face challenges in their sexual function and quality of life.[11,12] Social taboos have caused women with breast cancer to refrain from expressing their sexual problems to health care providers.[13]

On the other hand, women do want health care providers to assess their sexual function and give them the necessary advice.[14] The PLISSIT model is one such sexual health education model for cancer patients that was first created by Jack Annon and consists of four levels of intervention: permission (P), limited information (LI), specific suggestions (SS), and intensive therapy (IT).[15] This model is one of the most practical models in health systems because levels one and two of this model can be used by health care providers. In the extended PLISSIT model (Ex-PLISSIT model), it is believed that the permission phase affects all the stages of model implementation and each stage is underpinned by permission-giving. As a result, each stage in the Ex-PLISSIT model has permission-giving at its core, and techniques such as review and reflection are used to increase participants' self-awareness.[16] Since talking about sexual topics is considered taboo, women with cancer usually do not express their sexual problems easily. This model creates a suitable opportunity for women to express their sexual problems and receive specific information to solve them.[17] For most cancer patients, continued sexual activity are among the most important aspects of quality of life. Sexual communication and participation can lead to a sense of normality, increase sexual satisfaction, and improve women's relationships with their sexual partners.[18]

In recent years, the COVID-19 pandemic has limited the provision of health services to cancer patients.[19] Despite having sexual problems and educational needs, these patients face several problems in receiving these services.[20] Some women do not go to the clinic due to their immune system deficiencies and the risk of COVID-19 infection: this is the reason why telehealth and online consultations flourished in response to these problems during the COVID-19 pandemic.[21–23] As a result, the use of new technology in education can improve the health of patients not only during the present pandemic, but also during other future pandemics.[21]

Some studies have shown that sexual education based on the Ex-PLISSIT model can improve women's sexual function and sexual satisfaction with chronic diseases, such as diabetes and multiple sclerosis,[24,25] and in reproductive age.[26] But there are limited studies on women undergoing breast cancer treatment. Faghani and Ghaffari[27] showed that sex counseling based on the PLISSIT model improved the sexual function of breast cancer survivors after mastectomy.

The aim of the present study is to determine the effect of online sexual education based on the Ex-PLISSIT model on the sexual function and satisfaction of women undergoing breast cancer treatment.

Materials and Methods

Study design and setting

The present study was a quasi-experimental and interventional control study. It was conducted with a pretest–posttest design between April and July 2022 in, Isfahan, Iran. The study sample consisted of women who were undergoing breast cancer treatment and who signed into the Isfahan branch of cancer prevention and control center in 2020–22.

Study participants and sampling

The samples that met the study's inclusion criteria and expressed their consent to participate in the study by telephone call were selected. Women who had been treated for at least six months, were aged 18–50 years, were married (at least one year of marriage), and had no metastasis, no history of sexual dysfunction or referral to sex therapy due to sexual dysfunction before breast cancer, no use of psychoactive drugs, no diseases affecting sexual function such as cardiovascular disease and diabetes, and whose disease was not advanced were included in the study. The exclusion criteria included the participant who was unwilling to continue participating in the study, who failed to complete the questionnaire, and had metastasis during the study.

Convenience sampling was used to select eligible patients. According to other similar studies[28,29] and the formula $N = (z1\text{-}\alpha/2 - z1\text{-}\beta)^2/(\mu1 - \mu2/\sigma\sqrt{2})^2$ where $\alpha = 0.05$, power = 95%, and a dropout rate of 15%,

a sample size of about 40 people in each group was calculated. As a result, according to willingness to use online sexual education, the participants were divided into intervention (n = 40) and control (n = 40) groups [Table 1].

Data collection tools and technique

Data were collected through three questionnaires: The demographic questionnaire included the patient's age, spouse's age, patient's education level, spouse's education level, patient's occupation, spouse's occupation, social and economic status, length of marriage, number of children, and details related to their illness including when they had been diagnosed with cancer and the type of treatment they had received.

The Female Sexual function Index (FSFI) was used to measure the sexual function of women undergoing breast cancer treatment. This tool is a multidimensional self-report questionnaire. It includes 19 questions that evaluate the female sexual function in the domains of sexual desire, sexual arousal, vaginal lubrication, orgasm, sexual satisfaction, and dyspareunia. The questions are regarding women's sexual feelings and responses during the last four weeks.[30] An Iranian study confirmed the validity and reliability of this scale.[31]

In this study, Larson's Sexual Satisfaction Questionnaire was used to measure the sexual satisfaction of women undergoing breast cancer treatment. This questionnaire includes 25 questions (13 negative questions and 12 positive questions) the answers of which are scored based on a 5-point Likert scale.[32] The validity and reliability of this scale were confirmed by other studies in Iran.[33]

Intervention

Before the start of the intervention, through a virtual network, an online group was created to exchange information and answer questions of the intervention group. Then, online education for the intervention group was held one day a week. The intervention group was informed about the days and hours of the sessions through the online group. The link to join the meeting was sent to the online group members on the morning of the meeting. Only routine care was provided to the control group. Based on the four stages of the Ex-PLISSIT model, the education program was designed in four sessions that lasted 60–90 minutes [Figure 1].

Stages of the EX-PLISSIT model

In all sessions, the permission step was considered, and individuals were allowed to discuss their concerns and issues. Reflection and review, as well as exchange of views and discussions on learned issues were carried out during the consultation process.

First stage (permission)

At this stage, after introducing and explaining the objectives of the study, the researcher asked some open-ended questions about sexual function, and tried to notice her false beliefs, inadequate or wrong information, and sexual concerns. The participants were allowed to discuss their sexual concerns undergoing breast cancer treatment.

Second stage (permission, limited information)

During this stage, participants were educated about the concept of breast cancer, physical changes after breast cancer treatment, the anatomy of the female reproductive system and the sexual response cycle, the effect of

Table 1: Online sex education based on the Ex-PLISSIT model

Content	Duration (min)	Participant	Ex-PLISSIT	Session
Introduction and explanation on the study objectives	60	Women	Permission	Week 1
Opportunity for the participants to talk about their sexual life after breast cancer treatment			(Lecture, discussion, reflection, and review)	
Presenting information on the following: concept of breast cancer, physical changes after breast cancer treatment, anatomy of the female reproductive system and sexual response cycle, effect of cancer treatments on sexual function, common sexual problems in patients with breast cancer, and common psychological changes after cancer treatment	90	Women	Permission Limited information (Lecture, discussion, reflection, and review)	Week 2
Expressing sexual problems and ways of overcoming them	90	Women	Permission	Week 3
Management of common sexual problems after cancer treatment			Specific suggestion	
Relaxation techniques, breathing techniques, Kegel exercise			(Lecture, discussion, reflection, and review)	
Body image management				
Presentation on marital intimacy				
Communication styles and the importance of physical intimacy				
The importance and methods of supporting spouses of patients				
Referring two participants to a psychiatrist	60	Women	Permission Intensive therapy (Reflection and review)	Week 4

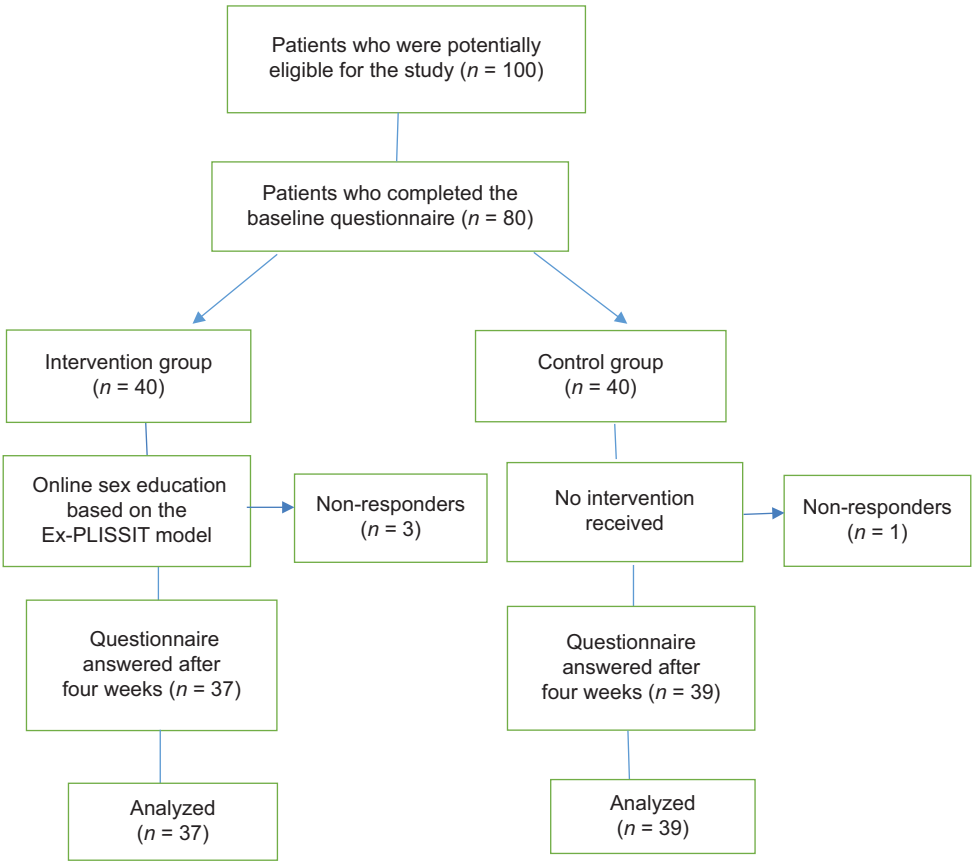

Figure 1: Flowchart of patient enrolment in the study

different cancer treatments on sexual function, common sexual problems in breast cancer patients, and common psychological changes after cancer treatment.

Third stage (permission, specific suggestion)

In this stage, specific suggestions were presented according to the knowledge obtained in the previous stages on the sexual problems of the participants. The training included appropriate measures to solve common sexual problems after cancer treatment, relaxation techniques, breathing exercises, Kegel exercises, and managing body image. Also, communication styles and the importance of physical intimacy and spouse supporting methods such as emotional and companionship support were presented by a psychologist.

Fourth stage (permission, intensive therapy)

Participants who needed intensive therapy were referred to the relevant specialist. After the referral, they were followed up via telephone. Subsequently, only two of the patients who were referred to a gynecologist and psycho-oncologist needed to undergo long intensive therapy.

The educational session was held by one of the study researchers who had completed the sexual education courses. The content of the training sessions was prepared and implemented under the supervision of a member of the research team who *specialized* in sex therapy. During the online education sessions, in addition to providing educational materials questions raised by group members were answered, and participants shared their experiences. Moreover, educations were provided based on the four stages of the Ex-PLISSIT model for the participants individually on demand. The researcher answered questions of the participants and sent messages for them through the virtual network.

After completing the educational sessions, educational content presented in the sessions was provided to the intervention group in the form of booklets. The control group received no intervention. After the intervention, the questionnaires were completed by the intervention and control groups. Thirty-seven cases from the intervention group and 39 from the control group completed the questionnaire. After the intervention and data collection, the booklet was given to the control group as well, to comply with the ethical principles.

Ethical considerations

This study was approved by the Ethics Committee of Isfahan University of Medical Sciences with the ethics code (IR.MUI.RESEARCH.REC.1399.501). The

participants were assured that the data would remain confidential. The participants expressed their consent to participate in the study. They were also assured that they could withdraw from the research at any stage of the study. The time of the training sessions was decided with the agreement of the participants.

Data analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 21 software (IBM Company, USA). *P* values below 0.05 were considered statistically significant. Independent *t*-test was used to compare the mean scores of the posttest of sexual function and sexual satisfaction between the intervention and control groups. Paired *t*-test was used to compare the mean scores of sexual function and sexual satisfaction before and after the intervention in the intervention and control groups.

Result

After the intervention, 37 participants in the intervention group and 39 in the control group completed the study. Three of the participants in the intervention group were excluded from the study due to their not participating in all of the training sessions and not completing the questionnaire after the intervention. In the control group, one of the participants was excluded from the study due to their not completing the posttest. The results showed no statistically significant difference between the groups in terms of demographic characteristics, including age, occupation, education, length of marriage, economic status, and type of treatment [Table 2].

There was no statistically significant difference in the mean of sexual function ($P = 0.587$) and sexual satisfaction ($P = 0.743$) scores between intervention and control groups before the intervention.

The results showed that the mean of sexual satisfaction and function scores in the intervention group significantly increased after the intervention. There was no statistically significant difference in the mean of sexual function and satisfaction scores in the control group after intervention. Moreover, the results showed that there was statistically significant difference in the mean of sexual satisfaction scores between the intervention and control groups after intervention ($P = 0.020$). Although there was a difference between the mean of sexual function scores in the intervention and control groups after the intervention, the *t*-test showed no a statistically significant difference ($P = 0.176$) [Table 3].

Discussion

The purpose of this study was to determine the effectiveness of online sexual education, based on the Ex-PLISSIT model on sexual function and satisfaction, on women undergoing breast cancer treatment. The results of the study showed that sexual education based on the Ex-PLISSIT model significantly increased the mean score of sexual satisfaction of women undergoing breast cancer treatment after the intervention. In contrast, the sexual satisfaction score did not significantly change in the control group. No other study has assessed the effectiveness of sexual education based on the Ex-PLISSIT model on the sexual satisfaction of women undergoing breast cancer treatment. However, a study by Ziaei *et al*.[34] showed that counseling based on the Ex-PLISSIT model increased the sexual satisfaction of pregnant women four weeks after the intervention. The results from an intervention study by Abedini *et al*.[35] also showed that the sexual satisfaction of women with breast cancer increased significantly after educational intervention. Contrary to the results of the present study, Fatehi *et al*.[36] showed that sexual satisfaction of women with breast cancer did not significantly improve three months after a psychosexual intervention program. It seems that the type of intervention has an effect on the sexual satisfaction of women with breast cancer.

In the present study, sexual education was conducted online to overcome this problem. In this context, a study by Hummel *et al*.[37] showed that internet-based cognitive behavioral therapy improved the sexual function and satisfaction of women with breast cancer and their partners.[38] Also, the results of the present study showed that the mean scores of the sexual function of the intervention group increased after the intervention, but this increase was not significant compared to the control group. Contrary to the results of the present study, Faghani and Ghaffari[27] showed that sexual counseling based on the PLISSIT model significantly improved sexual function in post-mastectomy breast cancer survivors. This difference could be because the participants of this study were breast cancer survivors and were not undergoing breast cancer treatment. In the present study, the participants were undergoing different treatments for breast cancer, and there was not enough time to determine the effect of the interventions on sexual disorders caused by the treatment and their sexual function. Moreover, as the participants were undergoing treatment, long-term follow-up of the effect of the intervention was not possible. In this regard, Mahmoodi Dangesaraki *et al*. showed that sexual counseling based on the Ex-PLISSIT model could improve the sexual function of women with cancer after eight weeks of the intervention.[39]As well as, the results of Faghani and Ghaffari's study about sexual function may be due to providing face-to-face individual counseling. The results of the above studies show the effectiveness of the PLISSIT model in improving the sexual function and satisfaction of patients with

Table 2: Comparison of socioeconomic, disease, and therapeutic characteristics of the participants between the two groups

	Mean (SD)		*P*
	Intervention Group	Control Group	
Age	41.3 (5.6)	41.8 (4.7)	0.650*
Husband's age	46.3 (7.5)	46.5 (6.6)	0.910*
Duration of marriage	19.757 (8.0)	19.696 (6.8)	0.970*
Education Level			0.897**
Primary school	2 (5.4)	1 (2.6)	
High school	6 (16.3)	8 (20.5)	
Diploma	17 (45.9)	19 (48.7)	
University degree	12 (32.4)	11 (28.2)	
Spouse's Education Level			0.536**
Primary school	7 (18.9)	6 (15.4)	
High school	4 (10.8)	8 (20.5)	
Diploma	18 (48.7)	14 (35.9)	
University degree	8 (21.6)	11 (28.2)	
Employment Status			0.792**
Housewife	31 (83.8)	32 (82.1)	
Employed	6 (16.2)	7 (17.9)	
Spouse's Employment Status			0.779**
Employee	5 (13.5)	7 (17.9)	
Manual Worker	8 (21.6)	8 (20.5)	
Self-employed	21 (56.8)	23 (59)	
Unemployed	3 (8.1)	1 (2.6)	
Economic Status			0.139**
Poor	7 (18.9)	9 (23)	
Average	30 (81.1)	26 (66.7)	
Good	0	(10.3)	
Type of Treatment			0.384**
Mastectomy + chemotherapy	3 (8.1)	3 (7.7)	
Lumpectomy + chemotherapy	2 (5.4)	3 (7.7)	
Lumpectomy + chemotherapy + radiotherapy	12 (32.5)	10 (25.6)	
Mastectomy + chemotherapy + radiotherapy	5 (13.5)	7 (17.9)	
Mastectomy + chemotherapy + radiotherapy + hormone therapy	7 (18.9)	6 (15.5)	
Lumpectomy + chemotherapy + radiotherapy + hormone therapy	8 (21.6)	10 (25.6)	

*Independent *t*-test. **Chi-squared test

breast cancer. According to this model, in the first step patients are allowed to discuss sexual concerns and their problems. Sociocultural factors have caused sexual issues to be considered taboo in most cultures, and women cannot easily talk about them with health care providers.[17,40,41] The Ex-PLISSIT model makes it easier for patients to talk about their sexual problems, and reviewing and reflecting on the problems in each session helps them gain more confidence to express their sexual needs. Also, this model identifies the limitations of the patient's information and provides specific suggestions according to the patient's needs.[16] Khoei *et al*.[42] showed that grouped sexuality education is more effective on sexual health outcomes of women with breast cancer. Moreover, Ziaei *et al*.[34] showed that the Ex-PLISSIT model and group counseling both improved the sexual function and satisfaction of pregnant women equally. According to the results of the present study, it seems that group educational intervention based on the Ex-PLISSIT model can improve the sexual satisfaction of women with breast cancer.

Limitations and Recommendation

Considering that the women participating in this study were undergoing treatment, it was not possible to randomly assign them to the intervention and control groups. Therefore, the lack of random sampling reduced the generalizability of the findings. Because the patients were under treatment and due to their lack of consent for long-term follow-up and the COVID-19 pandemic, it was impossible to evaluate the long-term impact of the intervention. Therefore, we suggest that the long-term effect of the interventions on patients' sexual function and satisfaction be investigated. Another limitation of this study is the lack of consideration of diseases, medications, and sexual dysfunction in men that may affect the sexual function of women undergoing breast cancer treatment.

Table 3: Comparing the mean and SD of patients' sexual function and sexual satisfaction in the two groups

Scale	Dimensions	Before Intervention	After Intervention	*P*
Sexual Function				
Intervention group	FSFI total	47.1±19.12	60.5±17.97	0.000**
	FSFI desire	4.4±1.80	5.7±1.37	
	FSFI arousal	7.3±3.81	9.8±3.60	
	FSFI pain	7.9±3.62	9.4±3.67	
	FSFI orgasm	8.0±4.57	11.0±4.41	
	FSFI lubrication	10.8±5.40	13.4±4.83	
	FSFI satisfaction	8.5±2.76	11.0±2.68	
Control group	FSFI total	49.5±19.70	48.7±20.18	0.371**
	FSFI desire	4.2±1.48	4.1±1.58	
	FSFI arousal	8.0±3.73	8.1±3.78	
	FSFI pain	8.4±4.05	8.2±3.99	
	FSFI orgasm	8.1±4.53	8.4±4.80	
	FSFI lubrication	11.7±5.85	11.1±5.14	
	FSFI satisfaction	8.8±3.68	8.6±3.76	
P		0.587*	0.176*	
Sexual Satisfaction				
Intervention group	85.0±14.42	97.9±12.65	0.000**	
Control group	86.0±14.07	86.2±14.35	0.789**	
P	0.743*	0.020*		

*Independent *t*-test. *Paired *t*-test

As two of the participants needed long intensive therapy, the research team does not claim that intensive therapy based on the common Ex-PLISSIT model was performed for all of participants. Although in the common Ex-PLISSIT model individual counseling is provided, it was not possible to coordinate with all patients in the intervention group to implement individual intervention overall due to the fact that the participants of this study were receiving different breast cancer treatments. In future studies, sexual education with long-term follow-up and couple sex education are recommended to investigate the effect of the intervention on the sexual function of patients

Conclusion

Results of this study showed that although the intervention had an effect on women's sexual satisfaction, it did not affect their sexual function. Overall, it seems that this education can help health care providers evaluate the sexual needs of the patients and provide appropriate suggestions in order to improve said patients' sexual satisfaction. Also, due to the limitations of face-to-face education during the COVID-19 pandemic, grouped online education can help patients receive the necessary information to meet their needs and interact with health care providers.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest

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