Journal of Midwifery & Reproductive Health

JMRH.mums.ac.ir

The Effect of Cognitive-Behavioral Therapy on Sexual Satisfaction of Women with Endometriosis: A Randomized Clinical Trial

Maryam Nikseresht (MSc)[1], Leili Hafizi (MD)[2], Fatemeh Erfanian Arghavanian (PhD)[3,4]*, Jamshid Jamali (PhD)[5], Seyed Mohsen AsghariNekah (PhD)[6]

[1] MSc Student of Ccounselling in Midwifery, Student Research Committee, Mashhad University of Medical Sciences, Mashhad, Iran
[2] Professor, Department of Obstetrics and Gynecology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
[3] Associate Professor, Nursing and Midwifery Care Research Center, Mashhad University of Medical Sciences, Iran
[4] Department of Midwifery, School of Nursing and Midwifery, Mashhad University Medical of Medical Sciences, Mashhad, Iran
[5] Associate Professor, Department of Biostatistics, School of Health, Mashhad University of Medical Sciences, Mashhad, Iran
[5] Associate Professor, Department of Educational and Counselling Psychology, School of Educational Sciences and Psychology, Ferdowsi University of Mashhad, Mashhad, Iran

ARTICLE INFO

Article type:
Original article

Article History:
Received: 12-Jun-2023
Accepted: 25-Jul-2023

Key words:
Endometriosis
Cognitive-behavioral Therapy
Counselling
Sexual satisfaction
Women

ABSTRACT

Background & aim: Endometriosis is one of the most common chronic inflammatory diseases of women that have destructive effects on sexual function. Therefore, need for counselling about sexual health is part of the treatment of these patients. The present study was designed to examine the effect of cognitive-behavioral counselling on the sexual satisfaction of women with endometriosis.

Methods: This clinical trial was conducted on 99 women with endometriosis referring to the clinic of a teaching hospital and a gynecology clinic in Mashhad, Iran from March 2022 to May 2023. Patients were selected through convenience sampling and divided into intervention and control groups using permutation blocks. Subjects in the intervention group received seven online cognitive-behavioral therapy sessions for 60-90 minutes weekly. Control group received routine care. Data were collected using sexual satisfaction scale for women (SSSW) in three stages including before, immediately, and one month after the intervention using independent t-tests, Mann-Whitney, chi-square, and Fisher's exact tests. The data were analyzed by SPSS software (version 25).

Results: The mean total score of sexual satisfaction immediately after the intervention was significantly higher in intervention than the control group (102.6±12.4 vs 81.5±19.9) (P<0.001). The mean total score of sexual satisfaction one month after the intervention was also significantly higher in intervention than the control group 94.0±17.3 vs 81.6±19.4) (P<0.001).

Conclusion: Since cognitive-behavioral therapy was effective in increasing sexual satisfaction of women with endometriosis, it is suggested to incorporate this approach in the educational programs tailored for reproductive health of women with endometriosis.

▶ *Please cite this paper as*:
Nikseresht M, Hafizi L, Erfanian Arghavanian F, Jamali J, AsghariNekah SM. The Effect of Cognitive-Behavioral Therapy on Sexual Satisfaction of Women with Endometriosis: A Randomized Clinical Trial. Journal of Midwifery and Reproductive Health. 2025; 13(3): 4897-4909. DOI: 10.22038/JMRH.2023.72973.2134

Introduction

Endometriosis is one of the most common chronic inflammatory diseases in which endometrial-like tissue grows outside the uterine cavity (1). This disease has various symptoms including dysmenorrhea, pelvic chronic pain, dyspareunia, dyschezia, dysuria, and infertility (2).

* *Corresponding author*: Fatemeh Erfanian Arghavanian, Associate Professor, Department of Midwifery, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran. Tel: 00989153056119, Email: erfanianf@mums.ac.ir

Based on WHO endometriosis affects roughly 10% (190 million) of reproductive age women and girls globally (3). In the study conducted by Kadivar et al. (2012) in Iran, the prevalence of extrapelvic endometriosis was reported as 14.8% (4). The economic burden caused by endometriosis is very high and is similar to other chronic diseases such as diabetes, Crohn's disease, and rheumatoid arthritis (5).

Definitive diagnosis of endometriosis is only possible through laparoscopy and histological confirmation. Currently, there is no cure for endometriosis. Treatment is only used to relieve symptoms. Treatment options include the administration of progesterone to prevent disease progression and surgery to remove adhesions through incision and destructive treatment (6-7). Endometriosis can significantly affect the reproductive health (6). One of the important aspects of reproductive health is sexual function (8). According to the study by Tavakol et al. (2011), all the variables related to women's sexual function are related to their sexual satisfaction (9). Sexual satisfaction as a part of sexual relations is defined as the analysis of sexual behavior based on pleasure in each person (10). According to the study of Montanari et al. (2013), women with severe endometriosis had disorders in orgasm and sexual satisfaction (11).

Chronic diseases can affect the sexual satisfaction (12). Recent studies show that sexual satisfaction of the sexual partner of women with endometriosis is lower than that of healthy women (13). The findings show that when the problems caused by endometriosis primarily involve pelvic pain, treatment aimed to relieve the clinical symptoms is not enough, and also these patients can significantly benefit from psychological interventions (14). Therefore, a psychological approach to manage endometriosis is an important therapeutic tool. It may also reduce the symptoms of depression caused by hormone therapy and strengthen women's skills in disease management (15). Cognitive-behavioral therapy (CBT) is a problem-based and time-sensitive approach to treatment that aims to reduce emotional distress and increase adaptive behavior in patients with a multitude of psychological and adjustment problems (16).

According to this approach, the individual's mentality resulting from his beliefs and attitude affects the information processing and leads to individual excitement and responses. Therefore, it seems that the person's ideas and thoughts about the problem form the type and intensity of worry (17). Among the existing psychological treatments, cognitive-behavioral therapy is less complicated in comparison with many treatment methods. Also, this type of intervention can be implemented in a shorter time frame; in addition, these interventions shape the style of healthy thinking and behavior in the form of systematic cognitive and behavioral programs in the lives of these patients (16,18). Also, cognitive-behavioral therapy is one of the most common techniques used in the treatment of sexual disorders (19-20). This method leads to a more positive attitude towards sexual relations and improves the sexual dysfunction of couples (21).

In the study of McCabe and colleagues, it was found that cognitive-behavioral therapy led to a positive attitude and thinking about sex, a more enjoyable sexual experience, improved sexual function in men and women, and reduced the probability of failure in sex (21). Fatehizadeh et al. (2013) reported that cognitive-behavioral counselling is an approach which affects women's sexual satisfaction (22). Boersen et al. (2021) in their survey, which investigated the views of patients with endometriosis regarding cognitive behavioral therapy after endometriosis surgical treatment, reported that these patients believe that CBT should be added to the standard treatment process of endometriosis as a group or individual form because CBT can improve quality of life (23).

It should be noted that group-based approaches may have advantages over individual therapy because the availability of therapists is limited. Group-based CBT may potentially be more cost-effective than individual CBT (24). In this regard, the need for counselling about reproductive and sexual health services is also part of the treatment and needs of patients with endometriosis (25). Therefore, considering the role of sexual satisfaction in marital life, quality of life, and mental health of individuals and consequently couples, as well as the lack of studies in this field

it is required to design such interventions to enhance sexual satisfaction of women with endometriosis. Therefore, the current study was designed to determine the efficacy of group-based cognitive-behavioral counselling on sexual satisfaction of women with endometriosis.

Materials and Methods

This clinical trial using a two-group pretest-post-test design was conducted from March 2022 to May on 99 women with endometriosis. The study was registered in Iranian Registry of Clinical Trials (IRCT) under code of IRCT IRCT20210919052516N1. The participants were all women with endometriosis who were referred to a gynecological clinic as well as endometriosis clinic of a teaching hospital in Mashhad, Iran, who were selected with the diagnosis of endometriosis and invited to participate in the research.

The inclusion criteria were: written informed consent to participate in the study, women of reproductive age (15-49 years), marriage, lack of chronic psychiatric disorders in the woman and her husband (self-reported), lack of known chronic diseases in the woman and her husband, having sex, diagnosis of endometriosis based on history, physical examination and the clinical imaging by the physician, lack of accidents in the last 6 months in the woman and her husband, lack of addiction to tobacco and alcohol in woman and her husband, the absence of diseases affecting the sexual function of the woman and her husband, lack of menopause, and lack of history of pelvic surgery.

Exclusion criteria during the study included not participating in more than two counselling sessions and unwillingness to continue the intervention, no adverse events occurring during the study as well as receiving another educational-counselling program during the intervention period.

In this study,simple randomization and permutation blocks method was used to generate the sequence of random assignment of the subjects to the groups under study. The sequence of random allocation of subjects was done using Random Allocation Software and the block size of two. To the best of our knowledge, when conducting this study, there was no similar study which examined the therapeutic effect of the intervention on reproductive health and sexual satisfaction to be used to determine the sample size. Therefore, the effect size formula, the error of 5%, the test power of 80%, and the effect size of 0.6 were used to calculate the sample size in each group which was 44.

$$n = \frac{2\left(z_{1-\frac{\alpha}{2}} + z_{1-\beta}\right)^2}{f^2} = \frac{2(1.96 + 0.84)^2}{0.6^2} = 44$$

However, due to the interventional nature of the study, and the probability of 20% drop out, 52 subjects were considered for each group. Figure 1 displays the CONSORT flow diagram of participant enrollments. Finally, 51 women in the intervention group and 48 women in the control group completed the trial and their data were entered in the analysis.

The researcher executed all the procedures and interventions; thus,there was no possibility of blindness .

Data collection tools was a self-report tools included sexual satisfaction scale for women (SSSW) (26). Meston and Trapnell (2005) (26) designed SSSW which has 30 questions and 5 dimensions: satisfaction (questions 1-6), communication (questions 7-12), compatibility (12-19), relational anxiety (questions 19-24) and personal anxiety (questions 25-30). The scoring system of SSSW is based on a 5-points Likert scale (from entirely agree to entirely disagree). Questions 1, 4, 5, 6, 9, 10, 11, 12 are scored reversely. The scores of each dimension are obtained from the total number of questions of that dimension. The total score is calculated as follows: (satisfaction + communication + compatibility + (relational anxiety + personal anxiety)/2); a higher score indicates more satisfaction. Cronbach's alpha coefficient was reported for the dimensions of the questionnaire up to 90%, for personal anxiety up to 74%, for communication dimension, and the total sexual satisfaction score up to 94%. The validity of the scale in Iran was confirmed by Roshan Chesli et al. (2013) through content validity. The reliability of the structure using confirmatory factor analysis and convergent-divergent reliability was applied to check the reliability. Also, the retest coefficients for the sexual satisfaction score and dimensions have been obtained from 73% to 97% (27). Therefore, the validity of this questionnaire has been confirmed in previous studies in Iran. The

validity of the sexual satisfaction questionnaire in this study was confirmed by obtaining the opinion of seven members of the academic staff. The reliability of the questionnaire was calculated by determining internal consistency (Cronbach's alpha). Cronbach's alpha for the sexual satisfaction questionnaire was 0.833, which indicates the internal reliability of the questionnaire.

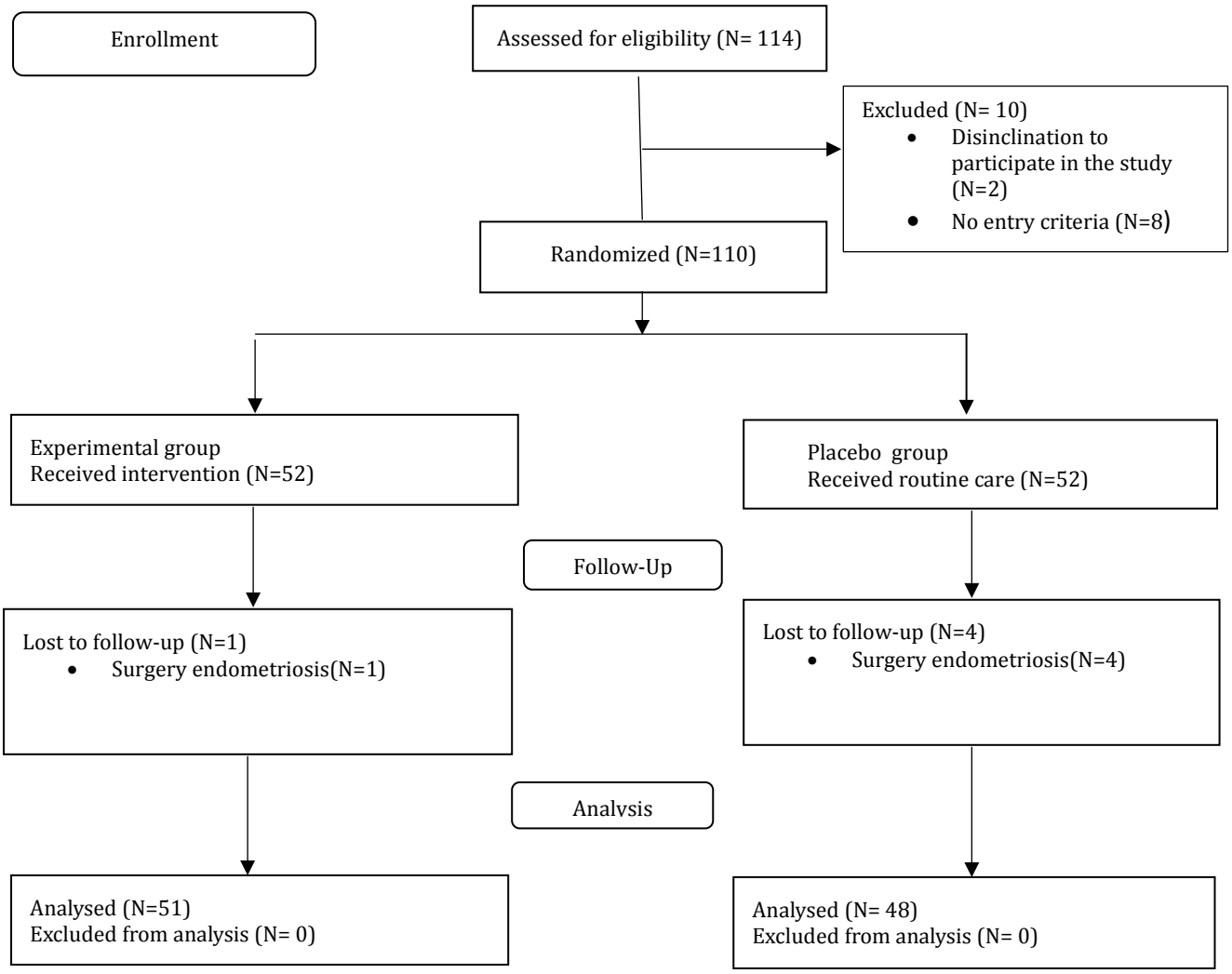

Figure 1. CONSORT Flowchart of the study

In both intervention and control groups, after providing the necessary explanations regarding the objectives of the research and respecting the independence of individuals to participate in the research, the participants were asked to complete the informed consent form and then the pre-test was taken. The sexual satisfaction questionnaire was completed by both groups before intervention.

The subjects in the control group only received routine care. For the intervention group, seven counselling sessions were held (average 6-8 people) by the researcher every week for 60-90 minutes each session. Seven virtual and group

counselling sessions were conducted through Skyroom among counselors and clients. Contents of the sessions are presented in table 1.

Table 1. The Content of Therapy Sessions

Session	Lesson
1	Establishing communication and introduction, explaining the counselling method and endometriosis, doing the pre-test, explaining the purpose of the study, discuss regarding the person's attitude about sexual problems, assignment: preparing a list of sexual concerns
2	reviewing homework, discussing the psychological problems they are facing, stress management training, assignment: stress management practice
3	rebuilding and eliminating negative thoughts about infertility, assignment: preparing a list of logical beliefs related to the disease
4	awareness of the sexual effects of the disease on the individual's body, learning about cognitive errors, assignment: preparing a list of cognitive errors
5	awareness of the stages of sexual response, the effects of endometriosis on sexual relations, cognitive reconstruction, and changing negative attitudes about sexual issues, as well as Kegel training to relax the pelvic floor muscles, assignment: preparing a list of illogical and logical beliefs about sexual issues
6	Familiarity with cognitive distortions of coping strategies, reconstruction of negative coping strategies. Assignment: monitoring and recording negative and positive coping strategies
7	conversation and problem-solving strategies, assignment: a conversation with spouse about a problem

In the seventh session (immediately after) and also one month after the end of the counselling sessions, the SSSW was completed as a post-test by the participants of the control and intervention groups.

After collecting the data, it was analyzed in two descriptive and analytical formats. Data analysis was done using SPSS software (version 25). $P<0.05$ was considered statistically significant. First, the Shapiro-Wilk test was used to check the normality of the data distribution of quantitative variables. Independent t-test/Mann-Whitney was employed to compare normal/abnormal quantitative variables in two groups; analysis of variance with repeated measures/Friedman test was used to evaluate the effect of counselling for normal/abnormal quantitative variables. Wilcoxon post hoc test was used for pairwise comparisons of data with non-normal distribution. Chi-square or Fisher's exact test was used to compare qualitative variables in two groups. Paired t/Wilcoxon was applied to evaluate the effect of counselling for normal/abnormal quantitative variables. Chi-square test was used to compare qualitative variables in two groups. Analysis of covariance was applied to control confounding variables.

Results

The mean age of the participants was 35.30 ± 5.60 years. Most of the participants in the study had university education (65%) and were housewives (57.1%). Moreover, 48.5% of women had a history of infertility and 34% had dyspareunia.

Only the variables of length of menstrual cycle, the number of pads used during menstruation, and the mean number of intercourses per week were significantly lower in the intervention group compared to the control group ($P=0.008$, $P=0.001$ and $P=0.031$, respectively), but the two groups were not significantly different in terms of other variables ($P>0.05$).

Also, the variables of the number of sexual relations with spouse from the beginning of the disease to the time of the interview ($P=0.005$) and the effect of endometriosis on sexual desire ($P=0.001$) were significantly different in the counselling and control groups, but the two groups were not significantly different in terms of other variables ($P>0.05$) (Tables 2 and 3).

Before the intervention, the mean total sexual satisfaction score in the counselling group was 83.0±25.5 and in the control group was 81.6±20.0, which did not show a statistically significant difference between the two groups ($P=0.590$).

Table 2. Comparison of quantitative variables between control and intervention groups

Variable	Group				Test result	P-Value
	Intervention		Control			
	SD ± Mean	Median (first quarter third quarter)	SD ± Mean	Median (first quarter third quarter)		
Age	35.8±6.0	37.5(31.3 40.0)	34.9±5.19	35.0(31.8 38.3)	T=0.75	0.452
Number of children	1.4±0.5	1.0(1.0 2.0)	1.4±0.5	1.0(1.0 2.0)	Z=0.04	0.965
Number of years married	9.9±7.6	9.0(3.0 16.0)	11.1±7.3	10.0(5.0 15.5)	T=0.71	0.477
Number of pregnancies	1.9±1.2	2.0(1.0 2.0)	1.7±0.6	2.0(1.0 2.0)	Z=0.21	0.836
gravid	1.4±0.5	1.0(1.0 2.0)	1.4±0.5	1.0(1.0 2.0)	Z=0.01	0.993
History of infertility (years)	4.6±3.3	3.5(2.0 5.5)	5.3±3.1	5.5(2.3 7.8)	Z=0.88	0.376
duration of illness	3.4±2.6	3.0(1.3 4.8)	4.5±3.3	4.0(1.5 6.0)	Z=1.48	0.139
Number of years under treatment	3.1±2.4	2.0(1.0 4.3)	3.7±2.9	3.0(1.6 5.8)	Z=1.29	0.198
Menstrual pain - stage 1	6.9±2.7	8.0(4.3 9.0)	6.9±2.5	7.0(5.0 9.0)	Z=0.12	0.902
Non-cyclic pelvic pain - stage 1	2.9±3.3	1.0(0.0 5.0)	2.5±3.0	1.0(0.0 5.0)	Z=0.52	0.604
Dyschezia- stage 1	1.9±3.2	0.0(0.0 3.8)	1.6±2.8	0.0(0.0 2.0)	Z=0.56	0.574
dysuria- stage 1	1.0±2.4	0.0(0.0 0.0)	0.8±2.0	0.0(0.0 0.0)	Z=0.60	0.549
Dyspareunia- stage 1	3.0±1.7	3.0(2.0 4.0)	3.5±2.0	4.0(2.0 5.0)	T=1.42	0.159
Average number of intercourses per week	2.1±0.8	2.0(2.0 2.0)	2.4±0.7	2.0(2.0 3.0)	Z=2.16	0.031

T: Independent Samples T-Test .Z: Mann-Whitney U test result

Table 3. Comparison of qualitative variables between control and intervention groups

Variable	Group		Total	Test result
	Intervention	Control		
Education				
Primary School	1(2.1)	1(2)	2(2)	
Secondary School	4(8.3)	4(7.8)	8(8.1)	
Diploma	14(29.2)	19(37.3)	33(33.3)	P=0.836
University	29(60.4)	27(52.9)	56(56.6)	
Total	48(100)	51(100)	99(100)	
Job				
Employee	12(25)	8(16)	20(20.4)	
Free	9(18.8)	6(12)	15(15.3)	
Student	5(10.4)	2(4)	7(7.1)	P=0.187
Housewife	22(45.8)	34(68)	56(57.1)	
Total	48(100)	50(100)	98(100)	
Does Anyone Else Live With You?				
Yes	1(2.2)	6(13)	7(7.7)	
No	44(97.8)	40(87)	84(92.3)	P=0.113
Total	45(100)	46(100)	91(100)	
Monthly Income				
Less Than Enough	8(16.7)	14(28)	22(22.4)	
Enough	33(68.8)	31(62)	64(65.3)	χ2=1.90
More Than Enough	7(14.6)	5(10)	12(12.2)	P*=0.388
Total	48(100)	50(100)	98(100)	
Menstrual Status				

Variable	Group		Total	Test result
	Intervention	Control		
Regular	33(68.8)	31(60.8)	64(64.6)	χ2=0.69 P*=0.407
Irregular	15(31.3)	20(39.2)	35(35.4)	
Total	48(100)	51(100)	99(100)	
History Of Abortion				
Yes	9(19.1)	13(26)	22(22.7)	χ2=0.65 P*=0.420
No	38(80.9)	37(74)	75(77.3)	
Total	47(100)	50(100)	97(100)	
History Of Infertility				
Yes	18(38.3)	29(58)	47(48.5)	χ2=3.72 P*=0.054
No	29(61.7)	21(42)	50(51.5)	
Total	47(100)	50(100)	97(100)	
Infertility Reason				
Male	2(11.1)	3(9.4)	5(10)	P=0.845
Female	16(88.9)	29(90.6)	45(90)	
Total	18(100)	32(100)	50(100)	
Recurrence After Endometriosis Treatment				
Yes	14(29.2)	14(27.5)	28(28.3)	χ2=0.04 P*=0.850
No	34(70.8)	37(72.5)	71(71.7)	
Total	48(100)	51(100)	99(100)	
Pelvic Surgery History - First Stage				
No	47(100)	51(100)	98(100)	-
Total	47(100)	51(100)	98(100)	
Do You Have Spotting Before Menstruation?				
Yes	18(39.1)	15(30)	33(34.4)	χ2=1.13 P*=0.287
No	28(60.9)	35(70)	63(65.6)	
Total	46(100)	50(100)	96(100)	
Yes	17(35.4)	27(52.9)	44(44.4)	
No	31(64.6)	24(47.1)	55(55.6)	
Total	48(100)	51(100)	99(100)	
Irregular Bleeding				
Sometimes	11(23.4)	11(22)	22(22.7)	χ2=3.08 P*=0.079
Most Of The Time	20(42.6)	12(24)	32(33)	
Always	2(4.3)	2(4)	4(4.1)	
Total	47(100)	50(100)	97(100)	
Bad	2(4.2)	0(0)	2(2)	
Very Bad	1(2.1)	2(3.9)	3(3)	
Total	48(100)	51(100)	99(100)	

*: Chi-square test result

The mean total sexual satisfaction score in the counselling group immediately after the intervention (102.6±12.4) was significantly higher than the control group (81.5±19.9) (P<0.001).

One month after the intervention, the mean total score of sexual satisfaction in the counselling group (94.0±17.3) was significantly higher than the control group (81.6±19.4) (P=0.003).

The difference in the total score of sexual satisfaction immediately after the intervention compared to before the intervention increased by 19.9±16.7 in the counselling group and decreased by -0.1±1.5 in the control group (P<0.001).

The difference in the total score of sexual satisfaction one month after the intervention compared to before the intervention increased by 11.4±13.1 in the counselling group and by 0.0±2.3 in the control group, and this difference was statistically significant in the two groups (P<0.001).

The difference in the total score of sexual satisfaction one month after the intervention

compared to immediately after the intervention decreased by -8.5±8.7 in the counselling group and increased by 0.0±1.7 in the control group, and this difference was statistically significant in the two groups (P<0.001).

Friedman's test showed a statistically significant difference between different measurements in the counselling group (P<0.001). The Wilcoxon post hoc test showed a significant difference immediately after the intervention compared to before the intervention (P<0.001); there was a significant difference one month after the intervention compared to before the intervention (P<0.001) and a significant difference one month after the intervention compared to immediately after the intervention (P<0.001). In the intragroup comparison of sexual satisfaction in the control group, the analysis of variance test with repeated measures showed no significant difference between the stages (P=0.930) (Table 4).

Table 4. Mean of the total sexual satisfaction score of women with endometriosis across the study phases in two control and intervention groups

Variable	Group				Mann–Whitney test	
	Intervention		Control			
	SD ± Mean	Median (first quarter third quarter)	SD ± Mean	Median (first quarter third quarter)	Statistic	P-Value
Before intervention (T1)	83.0±25.5	86.3(54.4 107.8)	81.6±20.0	80.5(69.5 96.5)	Z=0.54	0.590
Immediately after the (T2) intervention	102.6±12.4	101.5(94.0 115.5)	81.5±19.9	81.0(69.5 95.5)	Z=5.34	<0.001
One month after the (T3) intervention	94.0±17.3	89.5(80.5 114.0)	81.6±19.4	80.0(69.5 95.0)	Z=3.02	0.003
T2-T1	19.9±16.7	17.0(8.0 29.0)	-0.1±1.5	0.0(-0.5 0.5)	Z=8.06	<0.001
T3-T1	11.4±13.1	8.0(3.5 21.5)	0.0±2.3	0.0(-1.0 1.0)	Z=6.64	<0.001
T3-T2	-8.5±8.7	-5.5(-15.0 -1.0)	0.0±1.7	0.0(-1.0 1.0)	Z=6.51	<0.001
Intergroup test's result	Chi2=80.0 P<0.001 T1 vs T2: Z=8.8 P<0.001 T1 vs T3: Z=4.2 P <0.001 T2 vs T3: Z=4.6 P <0.001		F=0.03 P=0.930			

In terms of sexual satisfaction in the counselling group, in the satisfaction dimension of the questionnaire, there was a statistically significant difference in the scores of immediately after the intervention (25.7±3.5) and one month later (23.7±4.5) compared to the beginning of the study (20.2±7.4) (P<0.001).

In terms of communication dimension of the questionnaire, the scores obtained immediately after the intervention (26.1±3.7) and one month later (24.8±4.7) had a statistically significant difference compared to the beginning of the study (22.8±5.6) (P<0.001).

In terms of compatibility dimension of the questionnaire, the scores obtained immediately after the intervention (25.2±4.2) and one month later (23.2±5.5) had a statistically significant difference compared to the beginning of the study (20.4±8.1) (P<0.001).

In terms of personal anxiety dimension of the questionnaire, there was a statistically significant difference in the score immediately after the intervention (26.3±2.8) and one month later (23.9±4.2) compared to the beginning of the study (19.9±6.9) (P<0.001).

In terms of relational anxiety dimension of the questionnaire, the scores obtained immediately after the intervention (25.5±4.0) and one month later (22.3±5.5) had a statistically significant difference compared to the beginning of the study (19.4±7.2) (P<0.001). In the intragroup comparison in the control group, Friedman test in all dimensions showed no significant difference between the stages (Table 5).

Table 5. Mean of the dimensions of sexual satisfaction in women with endometriosis across the study phases in two control and intervention groups

Satisfaction	Group				Mann–Whitney Test	
	Intervention		Control			
	SD ± Mean	Median (First Quarter Third Quarter)	SD ± Mean	Median (First Quarter Third Quarter)	Statistic	P-Value
(T1) Before intervention	20.2±7.4	23.5(12.3 26.0)	18.6±6.3	18.0(14.0 24.0)	Z=1.22	0.223
Immediately after the (T2) intervention	25.7±3.5	26.0(23.0 29.0)	18.4±6.2	18.0(14.0 24.0)	Z=5.67	<0.001
One month after the (T3) intervention	23.7±4.5	24.0(19.0 28.0)	18.6±6.1	18.0(15.0 23.0)	Z=4.14	<0.001
T2-T1	5.6±4.8	4.0(2.0 10.0)	-0.2±0.9	0.0(0.0 0.0)	Z=8.16	<0.001
T3-T1	3.7±3.7	3.0(1.0 6.0)	0.1±1.1	0.0(0.0 0.0)	Z=6.28	<0.001
T3-T2	-2.0±2.3	-1.0(-4.0 0.0)	0.2±1.1	0.0(0.0 0.0)	Z=5.07	<0.001
Intergroup test's result	Chi2=69.6 P<0.001		Chi2=1.14 P=0.320			

Discussion

The current research was conducted with the aim of examining the efficacy of cognitive-behavioral counselling on sexual satisfaction of women with endometriosis. The findings indicated that cognitive-behavioral counselling improves the mean sexual satisfaction score in women with endometriosis which indicates the effect of this counselling approach on sexual issues. Endometriosis is one of the most common chronic inflammatory diseases in women which has negative effects on the sexual function of affected women, and in general, the presence of chronic diseases is one of the most important factors that can affect sexual satisfaction (8).

Ferrero et al. (2005) have shown that the symptoms of endometriosis (especially pain, which was the main concern of the participants in our study) affect intimacy and especially sexual satisfaction of women. This issue may be related to the direct relationship between dyspareunia and decreased sexual satisfaction (more pain during intercourse, reduced number of intercourse, less satisfying intercourse) (28). The relationship between pain and sexual satisfaction can also be explained by the cognitive model theory of negative expectations of sexual experiences. This theory states that the experience of pain and loss of pleasure is reinforced by repeated experiences of pain. In addition, this relationship could be due to the theory of central sensitivity. Pain in patients with endometriosis can become independent and recur even in the absence of environmental stimulation. This could mean that pain associated with this disease, and not necessarily dyspareunia, can affect the sexual experience of an affected woman. Interestingly, women with dyspareunia continue to have sex despite pain indicating that this may be an attempt by these women to try to prove themselves in their ideal female image. These findings show that the partner's pleasure can be more important for many women than their own pleasure and well-being (29). Therefore, these findings are consistent with the results of the present study.

Elsayed et al. (2018) in an interventional study titled "Evaluation of the effect of educational intervention on the quality of life and sexual function in women with endometriosis" found that the educational program was effective on the quality of life and sexual function in women with endometriosis and statistically significant difference was observed in the intervention group before and after the intervention (30). Since all variables related to women's sexual function are related to their sexual satisfaction (9) and the educational intervention was able to be effective on the sexual function of women with endometriosis, these findings are in accordance with the results of the current research.

According to the research of Babakhani et al. (2018) some incompatible thoughts, attitudes, and beliefs about different aspects of sex can affect a person's sexual activity and reaction to the stages of the sexual cycle. They also showed

that cognitive-behavioral counselling sessions caused a significant increase in all behavioral fields and sexual function of women. Among the available psychological treatments, cognitive-behavioral therapy seems to be suitable for endometriosis, because this type of intervention is less complicated compared to many treatment methods, which makes it suitable for patients suffering from chronic pain diseases.

Moreover, this type of intervention can be implemented in a shorter time frame, and also, these interventions shape healthy thinking and behavior in the form of systematic cognitive and behavioral programs in the lives of these patients, even when considering the continuation of treatment and related costs, cognitive-behavioral therapy is cheaper than drug therapy (16, 18, 31). Also, cognitive-behavioral therapy is one of the most common techniques used in the treatment of sexual disorders (19,20). Since all the variables related to women's sexual function are related to their sexual satisfaction and the present study was able to increase the sexual satisfaction of women with endometriosis by holding cognitive-behavioral counselling sessions, it is consistent with the present study.

Fatehizadeh et al. (2013) showed that cognitive-behavioral counselling compared to solution-oriented counseling has a greater effect on women's sexual satisfaction. Therefore, counselling can be used to prevent and improve women's sexual problems in educational, counselling, and treatment centers (22). In the cognitive-behavioral therapy sessions, not only irrational beliefs are challenged by cognitive techniques such as thought injection and logical analysis, but also the person is trained in behavioral and coping skills techniques such as muscle relaxation, problem-solving skills, self-expression, and interpersonal skills. After several consecutive therapy sessions, on the one hand, the person's negative spontaneous thoughts are transformed into purposeful thoughts which are more compatible with objective reality, and their cognitive processing becomes more logical. These results are also consistent with the findings of the current research.

McCabe et al. (2001) showed that after the treatment, the respondents had lower levels of sexual dysfunction, as well as experienced more pleasurable perceived sex, fewer aspects of the negative impact of sexual dysfunction in their relation and less chance of sexual failure. Accordingly, cognitive-behavioral therapy leads to a positive attitude and thinking about sex, a more enjoyable sexual experience, and improved sexual performance in women, and reduces the probability of sexual failure (21), which is consistent with the results of the present study.

In Udson et al.'s research in 2013, the findings showed that sexual satisfaction and the partner's sexual satisfaction of women with endometriosis is lower than that of healthy women, and they emphasized the need to implement intervention programs to increase sexual satisfaction of these women (13). These results are in line with the findings of the present study. The level of sexual satisfaction in these women is also low in the present study.

According to the study by Samantha Litzinger et al. (2005) on "investigating relationships between couples, sexual satisfaction, and marital satisfaction" (32), couples' communication skills may have a great impact on sexual and relational satisfaction, as well as other factors of sexual satisfaction (sexual frequency and orgasm). Women who experienced positive acts in their sexual relationships were more likely to have husbands who were sexually and relationally satisfied, as well as to feel satisfied themselves. So that the results of the present study show that establishing correct communication and sexual satisfaction with the spouse in women with endometriosis participating in the present study is a predictor of their sexual satisfaction. Therefore, it is consistent with the results of the present study.

Kfoury et al. (2023) conducted a case-control study. The participants completed an online survey that included questions about endometriosis, SSSW, the couple's satisfaction index, partner perceived responsiveness scale, and depression, anxiety, and stress scale. There was a relationship between endometriosis and impaired sexual satisfaction (33), which is consistent with the present study. Also, there was no relationship between endometriosis and couple's satisfaction and also stress, and anxiety, which are not consistent with the results of our study. The study by Kfoury et al. was conducted on Lebanese women, the sex is complex thus

Psychological, social, physical, and individual factors should be considered when discussing this issue. Therefore, the possible reason for the inconsistency of the results of their study with our study may be different cultures.

According to the results of the study by Barneveld et al. (2022) on "depression, anxiety and related factors in endometriosis" (34), the symptoms of depression and anxiety frequently occur in patients with endometriosis and are associated with chronic pain (34). Anxiety is a natural response to threat and danger and a part of normal human experience, but if this response is excessive lasts more than three weeks, and disrupts daily life, it can be a mental health problem. So the results of the present study show that the level of personal anxiety in women with endometriosis participating in this study is a predictor of their sexual satisfaction. Therefore, it is consistent with the findings of the present study.

In explaining these findings and considering the alignment of the above studies with the present study, it can be said that educational and counselling interventions are effective in improving the sexual satisfaction of women with chronic diseases. Therefore, in the current study, it was tried that the problems of women with endometriosis regarding sexual satisfaction be discussed in a consultation environment, so that each of the research subjects, by discussing their problems in this field, will receive correct information about endometriosis and its effects on sexual satisfaction, which will increase their level of sexual satisfaction and consequently family. Among the limitations of this research, we can mention the issue of sex, which may still be considered taboo by some Iranian women, as well as ensuring the correctness of the answers given by the participants was another limitation of this study that was tried to ensure the honesty of the participants in answering the questionnaires by providing explanations and convincing people. The study also has some strengths. According to our knowledge, this study is the first study that evaluates the effect of counselling on the sexual satisfaction of women with endometriosis, which is an important factor in the quality of life of patients.

The results of the present research can be used to provide cognitive-behavioral therapy on sexual satisfaction of women with endometriosis who are referred to health care centers and gynecology and obstetrics clinics in order to improve sexual health and reduce the complications caused by the disease and lack of awareness and subsequently improve sexual satisfaction, increase satisfaction and finally improving the quality of sexual life of women with endometriosis.

Conclusion

The results of the present study can provide health care providers, midwives, and gynecologists with a new way of providing cognitive-behavioral counselling services, which will lead to reduce the complications caused by endometriosis improve sexual satisfaction of women with endometriosis. In future studies, it is suggested to investigate the educational and counselling needs of women with endometriosis in the field of sexual health, as well as to compare other counselling methods with the method used in this study on the sexual satisfaction of women with endometriosis.

Declarations

Acknowledgements

This study is the result of a research proposal that was approved by Mashhad University of Medical Sciences, Mashhad, Iran. We hereby thank and appreciate the Vice president for Research of Mashhad University of Medical Sciences ,the cooperation of engaging staff in the study settings and the women participating in the research, and also to all the researchers whose studies were used in this study.

Conflicts of interest

The authors declared no conflicts of interest.

Funding

This study was financially supported by the Vice Chancellor for Research, Mashhad University of Medical Sciences, Mashhad, Iran.

Ethical approval

After receiving approval from the Ethics Committee of Mashhad University of Medical Sciences, the researcher informed the participants about the research aim, obtaining written consent maintaining the confidentiality,

and allowing the participants to withdraw from the study at any time during the study.

Code of Ethics

The ethics committee of Mashhad University of Medical Sciences approved the study with the code of IR.MUMS.NURSE.REC.1400.064.

Use of Artificial Intelligence (AI)

We have not used any AI tools or technologies to prepare this manuscript

Authors' contribution

MN, FEA, .and LH participated in the design of the study, analysis, and draft of the manuscript. MN, FEA and SMA corporated in the gathering of the counseling content; MN carried out the data collection; JJ interpreted the data;. All authors read and approved the final manuscript.

References

1. Reis FM, Petraglia F, Taylor RN. Endometriosis: hormone regulation and clinical consequences of chemotaxis and apoptosis. Human Reproduction Update. 2013; 19(4): 406-418.
2. Vercellini P, Viganò P, Somigliana E, Fedele L. Endometriosis: pathogenesis and treatment . Nature Reviews Endocrinology. 2014; 10(5) : 261-275.
3. WHO. Endometriosis. Available at: https://www.who.int/news-room/fact-sheets/detail/endometriosis.
4. Kadivar M, Vafa A, Farahzadi A, Khani S. 6 years evaluation of prevalence of abdominal wall endometriosis in patients with definite histopathological diagnosis of endometriosis admitted in Rasool-Akram, Shariati and Atieh Hospitals in Tehran. Razi Journal of Medical Sciences. 2012; 18: 93.
5. Klein S, D'Hooghe T, Meuleman C, Dirksen C, Dunselman G, Simoens S. What is the societal burden of endometriosis-associated symptoms? A prospective Belgian study. Reproductive BioMedicine Online. 2014; 28(1): 116-124.
6. Hogg S, Vyas S. Endometriosis update. Obstetrics, Gynaecology & Reproductive Medicine. 2018; 28(3) : 61-69.
7. Hjordt Hansen MV, Dalsgaard T, Hartwell D, Skovlund CW, Lidegaard Ø. Reproductive prognosis in endometriosis. A national cohort study. Acta Obstetricia et Gynecologica Scandinavica. 2014; 93(5): 483-489.
8. Glasier A, Gülmezoglu AM, Schmid GP, Moreno CG, Van Look PF. Sexual and reproductive health: a matter of life and death. The Lancet. 2006; 368(9547): 1595-1607.
9. Tavakol Z, Mirmolaei ST, Movahed ZM. The survey of sexual function relationship with sexual satisfaction in referred to Tehran South City health centers. Avicenna Journal of Nursing and Midwifery Care. 2011; 19(2): 50-60.
10. Masoumi SZ, Kazemi F, Nejati B, Parsa P, Karami M. Effect of Sexual Counseling on Marital Satisfaction of Pregnant Women Referring to Health Centers in Malayer (Iran): An educational randomized experimental study. Electron Physician. 2017; 9(1): 3598-3604.
11. Montanari G, Di Donato N, Benfenati A, Giovanardi G, Zannoni L, Vicenzi C, Solfrini S, Mignemi G, Villa G, Mabrouk M, Schioppa C. Women with deep infiltrating endometriosis: sexual satisfaction, desire, orgasm, and pelvic problem interference with sex. The journal of sexual medicine. 2013; 10(6): 1559-1566.
12. Gana K, Jakubowska S. Relationship between infertility-related stress and emotional distress and marital satisfaction. Journal of Health Psychology. 2016; 21(6): 1043-1054.
13. Udson N, Culley L, Law C, Denney E, Mitchell H, Baumgarten M, et al. Endopart study: Summary report and recommendations. 2013.
14. Facchin F, Barbara G, Saita E, Mosconi P, Roberto A, Fedele L, et al. Impact of endometriosis on quality of life and mental health: pelvic pain makes the difference. Journal of Psychosomatic Obstetrics & Gynecology. 2015; 36(4): 135-141.
15. Lorencatto C, Alberto Petta C, José Navarro M, Bahamondes L, Matos A. Depression in women with endometriosis with and without chronic pelvic pain. Acta Obstetricia et Gynecologica Scandinavica. 2006; 85(1): 88-92.
16. Wenzel A. Basic Strategies of Cognitive Behavioral Therapy. The Psychiatric Clinics of North America. 2017; 40(4): 597-609.
17. Smith D. Trends in counseling and psychotherapy. American Psychologist. 1982; 37(7): 802.
18. Hawton KE, Salkovskis PM, Kirk JE, Clark DM. Cognitive behaviour therapy for psychiatric problems: A practical guide. Oxford University Press; 1989.
19. Spence S. Psycho sexual Therapy: A cognitive- behavioral approach. 6 th ed, chapman & hall: springer & Business media. 2013.
20. Babakhani N, Taravati M, Masoumi Z, Garousian M, Faradmal J, Shayan A. The Effect of Cognitive-Behavioral Consultation on Sexual Function among Women: a Randomized Clinical Trial. Journal of Caring Sciences. 2018; 7(2): 83-88.

21. McCabe MP. Evaluation of a cognitive behavior therapy program for people with sexual dysfunction. Journal of Sex &Marital Therapy. 2001; 27(3): 259-271.
22. Mofid V, Ahmadi A, Etemadi O. The comparison of cognitive-behavioral counseling and solution-oriented counseling on women's sexual satisfaction in Isfahan. 2014.
23. Boersen Z, de Kok L, van der Zanden M, Braat D, Oosterman J, Nap A. Patients' perspective on cognitive behavioural therapy after surgical treatment of endometriosis: a qualitative study. Reproductive BioMedicine Online. 2021;42(4): 819-825.
24. Tucker M ,Oei TP. Is group more cost effective than individual cognitive behaviour therapy? The evidence is not solid yet. Behavioural and Cognitive Psychotherapy. 2007; 35(1): 77.
25. Navarria-Forney I, Bénard J, Mazloum A, Aerts L, Pluchino N, Streuli I. A web-based survey of reproductive awareness and choices in women with endometriosis. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2020; 251: 106-113.
26. Meston Meston C, Trapnell P. Development and validation of a five-factor sexual satisfaction and distress scale for women: The Sexual Satisfaction Scale for Women (SSS-W). The Journal of Sexual Medicine. 2005; 2(1): 66-81.
27. Roshan Chesli R, Mirzaei S, Nikazin A. Validity and reliability of multidimensional sexual satisfaction scale for women (SSSW) in one sample of Iranian women. Clinical Psychology and Personality. 2014; 12(1): 129-140.
28. Ferrero S, Esposito F, Abbamonte LH, Anserini P, Remorgida V, Ragni N. Quality of sex life in women with endometriosis and deep dyspareunia. Fertility and sterility. 2005; 83(3): 573-579.
29. Fritzer N, Haas D, Oppelt P, Hornung D, Wölfler M, Ulrich U ,et al. More than just bad sex: sexual dysfunction and distress in patients with endometriosis. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2013; 169(2): 392-396.
30. Hend Abdallah ES, Samia Abdel HHA. Effect of an educational intervention on quality of life and sexual function in women with endometriosis. International journal of studies in nursing. 2018; 3(2): 127.
31. Antonuccio DO, Thomas M, Danton WG. A cost-effectiveness analysis of cognitive behavior therapy and fluoxetine (Prozac) in the treatment of depression. Behavior therapy. 1997; 28(2): 187-210.
32. Litzinger S, Gordon KC. Exploring relationships among communication, sexual satisfaction, and marital satisfaction. Journal of sex & marital therapy. 2005; 31(5): 409-424.
33. Kfoury M, Barakat H, Hallit S, Saliba S. Association between endometriosis and sexual satisfaction among a sample of lebanese women. BMC Womens Health. 2023; 23(1): 164.
34. Van Barneveld E, Manders J, van Osch FHM, van Poll M, Visser L, van Hanegem N, et al. Depression, Anxiety ,and Correlating Factors in Endometriosis: A Systematic Review and Meta-Analysis. Journal of women's health. 2022; 31(2): 219-230.