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EFFECTIVENESS OF COGNITIVE BEHAVIORAL THERAPY ON SEXUAL SELF-EFFICACY IN REPRODUCTIVE-AGED WOMEN WITH CARDIOVASCULAR DISEASE

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Abstract

Sexual self-efficacy is the belief individuals hold about their capability to engage effectively in sexual activities and be desirable to their partners. Cardiovascular diseases may cause significant physical and psychological impairments in affected individuals, often leading to sexual dysfunction..This study aimed to evaluate the effectiveness of cognitive behavioral therapy on sexual self-efficacy in reproductive-aged women with cardiovascular disease.

Material and methods.*This randomized controlled clinical trial was conducted on 60 women with cardiovascular diseases referred to health centers affiliated with Shahrekord University of Medical Sciences. Participants were randomly assigned into intervention (n=30) and control (n=30) groups using permuted block randomization. All participants completed a demographic questionnaire and the Sexual Self-Efficacy Questionnaire before the intervention. The intervention group received eight 1-hour virtual cognitive behavioral therapy sessions twice a week, while the control group received standard care. The* Sexual Self-Efficacy Questionnaire *was completed again immediately and one month after the intervention. Data were analyzed using SPSS v25 with descriptive and inferential statistics (p≤0.05).*

Results and discussion. *Result of the current study showed that there is no significant difference in* Sexual Self-Efficacy Questionnaire *scores between the groups before the intervention (p=0.58). However, the mean* Sexual Self-Efficacy Questionnaire *score significantly improved in the intervention group both immediately and one month after the intervention compared to the control group (p≤0.001).*

Conclusion.*We may suggest that cognitive behavioral therapy can be effective in enhancing sexual self-efficacy among women with cardiovascular disease and may be recommended alongside other treatments to improve quality of life.*

Keywords: *cognitive behavioral therapy, sexual self-efficacy, cardiovascular disease.*

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Introduction

Cardiovascular diseases are among the most prevalent chronic conditions worldwide, posing a significant burden on global health systems and affecting millions annually [*Vos T et al., 2019; WHO reveals leading causes of death and disability worldwide., 2000-2019*]. According to data from the Centers for Disease Control and Prevention, the age-adjusted prevalence of heart disease was reported to be 7% in men and 4.2% in women as of 2019 [*CDC., 2023, Gardezi SA et al., 202*5]. While considerable efforts have been made to manage the physical complications of cardiovascular diseasess, their psychosocial ramifications particularly in the realm of sexual health—remain under-addressed [*Levin RF., 1987*].Sexual dysfunction is a frequent but often overlooked consequence of cardiovascular diseasess, with studies indicating prevalence rates as high as 62.6% [*Ziapour A et al., 2024*]. Patients with cardiovascular conditions are up to three times more likely to report difficulties in sexual performance and satisfaction compared to healthy individuals [*Soroush A et al., 2018*]. These issues stem not only from physiological impairments and side effects of cardiac medications but also from psychological stressors such as anxiety, fear of recurrence, body image concerns, and reduced confidence in one's sexual capabilities [*Tirgari B A et al., 2019; Abbasi A et al., 2020; Varaei S A et al., 2017; Huffman JC et al., 2008*]. Sexual self-efficacy, defined as an individual's belief in their ability to perform and enjoy sexual activity, is a critical determinant of sexual function and overall well-being [*Vaziri et al., 2010*]. Low sexual self-efficacy can perpetuate a cycle of avoidance, relational distress, and diminished quality of life. Therefore, addressing this component is essential for comprehensive cardiac rehabilitation [*Hummel S.B et al., 2015; Murphy P.J et al., 2018; Byrne M et al., 2013*].Cognitive Behavioral Therapy (CBT) has emerged as an effective and structured psychotherapeutic approach for modifying dysfunctional thoughts and behaviors [*Ter Kuile MM et al., 2010; Tsai T-F et al., 2011*]. It is particularly valuable in treating sexual dysfunctions linked to chronic illnesses, as it emphasizes cognitive restructuring, behavioral activation, and emotional regulation *[Wenzel A et al., 2013; Wenzel A et al., 2017*]. CBT's adaptability and evidence-based framework make it an ideal candidate for enhancing sexual self-efficacy among women with cardiovascular diseases [*Wenzel A et al., 2013; Nezamnia M et al., 2020*]. Given the complex interplay between chronic illness and sexual well-being, this study was designed to evaluate the efficacy of CBT in improving sexual self-efficacy in reproductive-aged women diagnosed with cardiovascular disease. The integration of CBT into routine care may offer a holistic approach to improving both psychological and sexual health outcomes in this population. As the International Confederation of Midwives considers counseling and education on sexual and reproductive health issues as part of the midwives' responsibilities [*ICM.,2011*], in Iran, midwives are in a unique position to promote sexual health and provide sexual counseling to individuals under their care due to their close relationship with patients [*Mohseni M et al., 2023*]. These services are considered an integral part of midwifery and reproductive health care.Considering that the examination of various aspects of the lives of heart disease patients is one of the main priorities of the healthcare system in Iran, and that one important aspect of their lives is sexual issues, unfortunately, due to cultural and social barriers, many of these individuals avoid discussing and consulting about this topic and feel ashamed. Furthermore, the healthcare system's neglect of this area has led to a significant gap in research and educational field related to the sexual issues of these patients. Given the importance of reproductive health services in the field of midwifery in Iran, this study was decided to be conducted with the aim of examining the impact of cognitive-behavioral therapy on improving sexual performance and self-efficacy in women with heart disease.

Materials and methods

Study design and participants: This study was conducted as a randomized controlled clinical trial with a one-month follow-up. The study population consisted of 60 reproductive-aged women within the 18 to 49 years old who diagnosed with cardiovascular disease and referred to health centers affiliated with Shahrekord University of Medical Sciences (SKUMS) in Iran. The study protocol was approved by the SKUMS Ethics Committee (Ethics code: IR.SKUMS.REC.1403.030) and registered in the Iranian Registry of Clinical Trials (IRCT20100524004015N2).

Inclusion criteria: Participants were required to meet the following conditions to be eligible for inclusion in the study: a minimum level of literacy sufficient to complete the study questionnaires; a confirmed diagnosis of Class I or II heart disease by a physician; and marital status indicating that they were currently married, living with their spouse, sexually active, and had been married for at least three years. In terms of mental and physical health, neither the participant nor her spouse was to have any known mental disorders, physical illnesses such as thyroid disease, hypertension, diabetes, or cancer, or any diagnosed sexual dysfunction.

Exclusion criteria: Participants were excluded from the study if they met any of the following conditions: incomplete responses to the questionnaires; unwillingness to continue participation; occurrence of major life events such as the death of the participant or their spouse, or divorce during the study period; onset of new physical illnesses (e.g., thyroid disorders, hypertension, diabetes, cancer) or new mental health conditions in either the participant or their spouse; experiencing severe stress during the study; progression of heart disease to Class III or higher; initiation of any medical, pharmaceutical, or counseling interventions aimed at addressing sexual problems during the study; and other disqualifying factors such as pregnancy, alcohol consumption, or drug use during the research period.

Sample size calculation: Based on the study by Nezamnia et al. (2020), the following parameters were used for calculating the required sample size. Mean Difference (Effect Size):7, The standard deviations for the two groups were 5.5 each, the probability of a false positive (α), set at 0.01 (1%), The probability of a false negative(β) set at 0.05 (5%), The result of the sample size calculation for each group (without attrition) was 23 participants. Given a 22% attrition rate, the sample size was adjusted and rounded 30 participants per group [*Nezamnia M et al., 2020*].

Sampling: After obtaining ethical approval from the Ethics Committee of Shahrekord University of Medical Sciences and registering the study with the Iranian Clinical Trials Center, the sampling process began. The researcher used targeted sampling, visiting health centers affiliated with Shahrekord University of Medical Sciences. Participants were informed about the study's objectives, gave their informed consent, and were assured that their personal information would remain confidential. Ultimately, 60 women, aged 18-49, who had their heart disease confirmed by a physician at the health centers, were included in the study.

Randomization and allocation: Participants were randomly assigned to either the intervention (n=30) or control group (n=30) using permuted block randomization (block size=6) with a 1:1 allocation ratio.

Intervention protocol: The intervention group received eight 60-minute cognitive behavioral therapy sessions delivered twice a week over four weeks via the virtual platform Skyroom.

Session One

- Introduction, getting to know each other, explaining the study's goals, emphasizing the confidentiality of information [*Nezamnia M et al., 2020*].
- Definition and explanation of cardiovascular disorders and their impact on sexual dysfunction [*Moradinasab S et al., 2023*].
- Overview of types of sexual dysfunctions and their impact on marital relationship quality, counseling in CBT, and its objective [*Sheikh Miri, A et al., 2023*].

Assignment: Practice identifying cognitive distortions [*Mohseni M et al., 2023*].

Session Two

This session is dedicated to evaluating ineffective sexual thoughts and beliefs in the context of heart disease, including:

- Assessing thoughts, emotions, beliefs, behaviors, and physical symptoms associated with the disease
- Identifying prevalent negative sexual attitudes
- Examining irrational sexual beliefs and explaining them scientifically
- Discussing preferences and sexual desires between partners and how to communicate these to each other
- Understanding the sexual perspective of women with heart diseases and the physical and emotional stages of intimacy [*Moradinasab S et al., 2023*].

Assignment: Identify personal negative thoughts and positive thoughts, practice deep

breathing, and muscle relaxation strategies [*Fathalian M et al., 2022*].

Session Thrie

Focuses on cognitive restructuring to change negative attitudes towards sexual concerns related to physical illness. This includes:

- Reviewing the previous session's content.
- Cognitive restructuring for psychological adaptation to chronic health problems.
- Cognitive restructuring to enhance coping skills for intrusive thoughts and negative beliefs related to the illness.
- Helping identify negative thought patterns and replacing ineffective cognitive responses with more adaptable and accurate thinking [*Moradinasab S et al., 2023*].

Assignment: Cognitive restructuring practice [*Mohseni M et al.,2023*].

Session Four

Providing sexual education relevant to illnesses. This includes:

- Introduction of factors affecting sexual dysfunction.
- Familiarization with sexual organs, their physiological functions, and hormones.
- Educating on sexual sensitivity, psychological and physical benefits of sexual activity, and the role of women in sexual relationships.
- Communication skills focus, exploring schemas: negative automatic thoughts, intermediate thoughts (conditional assumptions, musts), rules, and core beliefs [*Moradinasab S et al., 2023*].

Assignment: Write down negative automatic thoughts experienced over the coming week [*Fathalian M et al., 2022*]

Session Five

Introducing cognitive distortions such as mind reading, predicting disasters, labeling, minimizing positive aspects, mental filtering, overgeneralization, black-and-white thinking, should statements, personalization, blaming others, unfair comparisons, perpetual regret, emotional reasoning, and judgmental thinking.

Assignment: Identify cognitive distortions encountered during the week [*Fathalian M et al., 2022*].

Also, focus on non-sexual mindfulness techniques: body awareness, developing concentration and attention skills, verbal communication, expressing emotions, and enhancing intimacy between partners [*Moradinasab S et al., 2023*].

Assignment: Identify cognitive distortions to report the following week [*Fathalian M et al., 2022*].

Session Six

Focus on sexual mindfulness. This includes:

- Reviewing the previous session.
- Providing more information about genitalia and erogenous zones.
- Improving self-awareness and focusing on sexual organs, bodily sensations, and sexual excitement and fantasies [*Moradinasab S et al., 2023*].

Assignment: Implement learned techniques throughout the week and challenge cognitive distortions [*Fathalian M et al., 2022*].

Session Seven

- Teaching skills for addressing sexual problems in specific circumstances, including milestone maneuvers, intimacy, and orgasm.
- Training on problem-solving skills and their applications in everyday life to reduce anxiety-provoking situations [*Rostamkhani F et al., 2022*].

Assignment: Apply the learned skills [*Fathalian M et al., 2022*].

Session Eight:

Evaluating the application and effectiveness of educational methods, assessing satisfaction with outcomes, providing feedback, addressing any remaining issues, and summarizing key points from the therapy sessions. Post-test administration [*Fathalian M et al., 2022*].
Sharing participants' experiences and scheduling follow-up sessions [*Mohseni M et al., 2023*].

The sessions were facilitated by a certified midwife trained in CBT alongside a licensed clinical psychologist. Each session focused on CBT principles tailored to sexual health in the context of chronic illness. Participants were also assigned daily exercises (30 minutes/day, six days/week) to reinforce session content. Session content was developed based on literature review and validated

by six academic experts in reproductive health and clinical psychology. The control group continued with routine cardiac care and received no additional psychological intervention during the study period.

Data collection instrument: Demographic and clinical characteristics were collected using a structured questionnaire. Sexual self-efficacy was assessed using the Sexual Self-Efficacy Questionnaire for Women, developed by Vaziri and Lotfi-Kashani[*Vaziri et al.,2010*]. The exual Self-Efficacy Questionnaire contains 10 items rated on a 4-point Likert scale (0=not true at all to 3= completely true), with total scores ranging from 0 to 30. Higher scores indicate greater sexual self-efficacy. The reliability of the exual Self-Efficacy Questionnaire has been confirmed in previous studies, with Cronbach's alpha reported at 0.86 [*Vaziri et al.,2010*]. The exual Self-Efficacy Questionnaire was administered by two groups (intervention and control) at three time points, baseline as a pre-test, immediately post-intervention, and one-month post-intervention.

Statical analysis: Data analysis was performed using SPSS software version 25. Descriptive statistics (mean, standard deviation, frequency, percentage) and inferential statistics including independent t-tests, repeated measures ANOVA, and ANCOVA were employed. A significance level of ($p \leq 0.05$) was considered statistically significant.

RESULTS

A total of 60 participants were initially randomized into the intervention (n=30) and control (n= 30) groups. Four participants were excluded during the study: two in the control group due to incomplete questionnaire data and two in the intervention group (one due to incomplete data and two for missing more than two therapy sessions). Ultimately, 56 participants (28 per group) were included in the final analysis.

Baseline characteristics: There were no statistically significant differences between the intervention and control groups in terms of baseline demographic and clinical variables, including age, duration of marriage, number of children, age of spouse, and duration of cardiovascular disease ($p \geq 0.05$ for all variables).These results are summarized in table 1.

Sexual self- efficacy scores: As shown in table 2, the results of the repeated measures test indicate that the mean score of the sexual self-efficacy index in the intervention group demonstrated a statistically significant difference before, immediately after, and one month after the intervention ($p \leq 0.001$). However, in the control group, there was no statistically significant difference at any of these time points ($p = 0.2$). As shown in table 3, the results of the repeated measures test indicated that the mean score of the sexual self-efficacy index in the intervention group showed a statistically significant difference before, immediately after, and one month after the intervention ($p \leq 0.001$). However, in the control group, no statistically significant difference was observed before, imme-

TABLE 1.

Comparison of mean and standard deviation of demographic characteristics in intervention and control groups

Variable	Group	Mean	SD	P-Value
Age (years old)	Control	36.32	9.68	0.31*
	Intervention	33.89	7.97	
Marriage duration (year)	Control	14.96	11.82	0.31*
	Intervention	12.25	7.54	
Number of children	Control	1.86	1.08	0.92*
	Intervention	1.82	1.42	
Husband age	Control	40.71	10.31	0.35*
	Intervention	38.29	8.84	
Duration of disease (year)	Control	8.00	9.05	0.61*
	Intervention	9.21	8.27	

NOTES: **Independent t-test*

TABLE 2.

Comparison of the mean and standard deviation of the sexual self-efficacy index score before, immediately, and one month after the intervention in the intervention and control groups.

Taim of intervention		Sexual Self-Efficacy		P_1-value
		Control	Intervention	
Before	**Mean**	15.54	14.57	0.58*
	SD	7.61	5.17	
	P value	0.20	<0.0001	
Immediately after	**Mean**	13.07	24.64	<0.001**
	SD	8.31	2.93	
	P value	0.20	<0.0001	
One month after	**Mean**	13.57	24.50	<0.001**
	SD	9.97	3.51	
	P_2 value	0.20	<0.0001	

Notes: **-Independent sample, **- T-test, Covariance analysis, ♯- Repeat measure analysis*

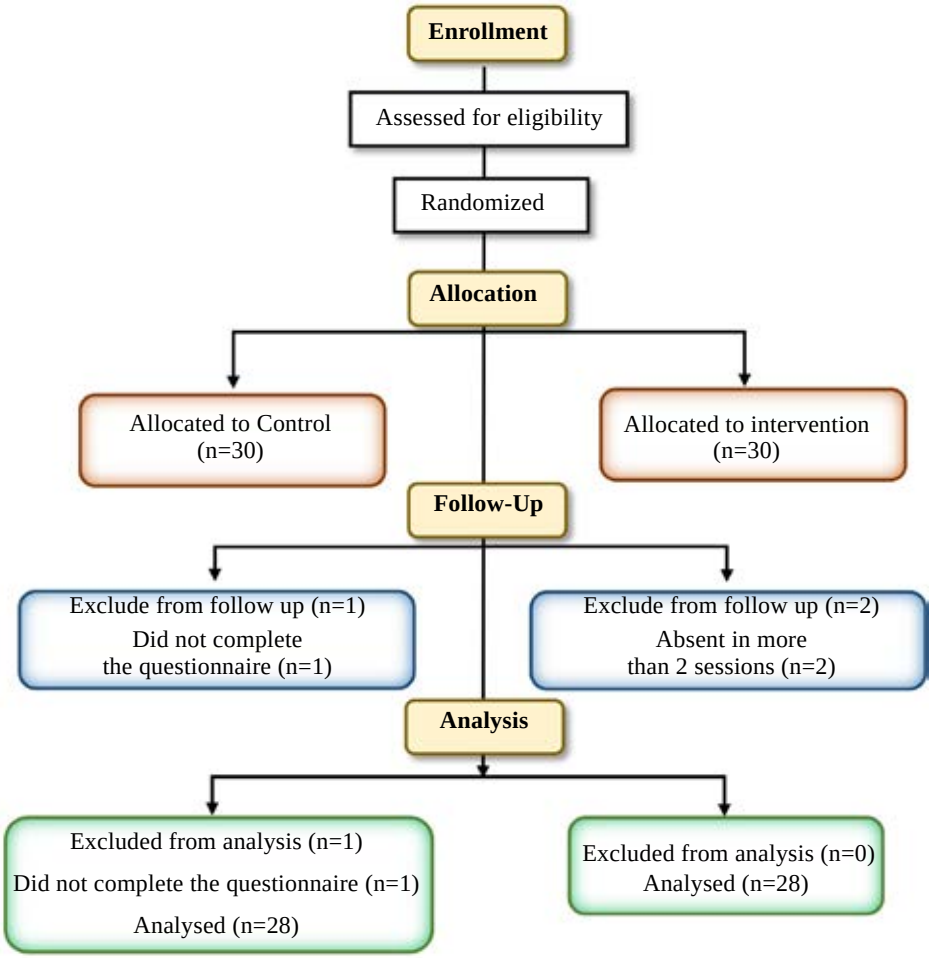

Diagram 1*. Participant flow diagram illustrating enrollment, randomization, allocation, and study attrition.*

diately after, or one month after the intervention (p=0.91). Additionally, the independent t-test revealed no statistically significant difference in the mean score of the sexual self-efficacy index between the intervention and control groups before the intervention (p=0.58). However, the ANCOVA showed a statistically significant difference in the mean score between the two groups immediately after the intervention (p≤0.001), and this significant difference was maintained one month after the intervention (p≤0.001).

Consort flow diagram: A Consort flow chart (diagram 1) details the recruitment, randomization, follow-up, and analysis stages, demonstrating adherence to rigorous trial standards and transparent participant flow.

Discussion

This randomized controlled trial examined the efficacy of cognitive behavioral therapy (CBT) in enhancing sexual self-efficacy among reproductive-aged women diagnosed with cardiovascular disease. The findings indicate a significant improvement in sexual self-efficacy following the CBT intervention, both immediately and at one-month follow-up, compared to routine care. These results align with prior studies, including *Nezamnia et al. (2022)*, which demonstrated the positive impact of CBT on sexual self-efficacy and sexual functioning in pregnant women. The results of this study showed that cognitive-behavioral intervention significantly increased the sexual self-efficacy of pregnant women, both compared to their pre-treatment levels and relative to the control group at two and four weeks post-intervention, during both the post-treatment and follow-up periods [*Nezamnia M et al., 2020*].Similarly, *Bakhté et al (2018)* found CBT to be effective in increasing sexual self-efficacy among women with gestational diabetes. Such consistency across different populations reinforces the role of CBT as an evidence-based intervention for addressing sexual dysfunction as-

sociated with chronic medical conditions. *Wei et al. (2018)* also demonstrated that cognitive-behavioral counseling is effective in enhancing self efficacy among individuals with type 1 diabetes [*Bakhteh A et al., 2018*]. In interpreting the findings of the present study, it can be suggested that sexual dysfunction in cardiac patients is often rooted in psychosocial factors, particularly the fear of experiencing an acute cardiac event [*Abbasi A et al., 2020; Varaei S A et al., 2017*].The mechanism by which CBT enhances sexual self-efficacy is multifaceted. It addresses the cognitive distortions and maladaptive beliefs commonly associated with chronic illness and sexual fear. In patients with cardiovascular diseases, sexual dysfunction is often exacerbated by psychological factors such as fear of cardiac events, anxiety, and low sexual self-confidence [*Blenkiron P., 2010*]. CBT promotes adaptive thinking patterns, emotional regulation, and behavioral strategies that collectively empower individuals to regain control over their sexual health [*Rahimi E., 2009*]. Moreover, CBT emphasis on education, communication skills, and intimacy-building may foster a more supportive and informed sexual relationship between partners. This therapeutic approach not only mitigates individual psychological barriers but also enhances relational dynamics, contributing to improved quality of life. Despite these promising findings, the study has some limitations. The sample was limited to women, and all therapy sessions were conducted virtually, which may affect generalizability. Future research should explore face-to-face interventions, include male or couple-based samples, and investigate long-term outcomes of CBT on sexual and relational health in cardiac populations.

Conclusion

This study provides evidence that cognitive behavioral therapy is an effective intervention for improving sexual self-efficacy in women with cardiovascular disease. Integrating CBT into comprehensive cardiac care plans may significantly contribute to the psychosocial rehabilitation of female patients, ultimately enhancing their sexual well-being and overall quality of life. Healthcare providers, particularly those in reproductive and cardiac care settings, are encouraged to consider structured CBT programs as part of a multidisciplinary approach to sexual health management in women with chronic condition.

Declarations: *The study was approved by the ethics committee of Shahrekord University of Medical Sciences, with the ethics code IR.SKUMS.REC.1403.030. The patients were informed about the details and aims of the study. Informed consent was obtained from all the participants, and procedures were conducted according to the Declaration of Helsinki.*

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