Ghafuri *et al.*
Contraception and Reproductive Medicine (2025) 10:5
https://doi.org/10.1186/s40834-025-00337-8

Contraception and Reproductive Medicine

RESEARCH

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Investigating the impact of couple counseling based on the CHARMS model on sexual quality of life and marital satisfaction of wives of men suffering from myocardial infarction: a randomized clinical trial study

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Abstract

Introduction Cardiovascular diseases can adversely affect the quality of sexual life and marital satisfaction for both patients and their spouses. The aim of the current study is to determine the effect of couple counseling based on the CHARMS model on sexual quality of life and marital satisfaction of wives of men suffering from myocardial infarction (MI).

Method This two-group randomized clinical trial study with a parallel design was conducted in 2024 in Urmia, Iran. Participants included men with myocardial infarction and their spouses. Sampling was done on a convenience basis. Participants were randomly allocated into two groups: control (50 couples) and intervention (50 couples). The intervention consisted of six counseling sessions. Couples in intervention group were divided into six groups. Each group attended counseling sessions following the CHARMS model on a weekly basis. Data collection tools were include: Demographic information questionnaire, Women's Sexual Quality of Life Questionnaire and Enrich Marital Satisfaction Questionnaire, which were completed by women in both groups before and after the intervention. The Independent t-test, Chi-square, Fisher's exact test and a general linear model were used for comparing groups with SPSS software. The data analyst was blinded to the group allocation.

Findings The average age of women in the intervention and control groups was 45.16 ± 5.90 and 44.75 ± 4.94 years, respectively, with most being housewives and having two children. The average age of men in the intervention and control groups was 48.6 ± 4.51 and 47.5 ± 5.5 years, respectively. The demographic and clinical characteristics of the two groups were similar ($P > 0.05$). Before the intervention, the average scores for sexual quality of life and marital satisfaction among women were not statistically significantly different between the control and intervention groups ($P > 0.05$). After the intervention, based on the ANCOVA and after adjusting for the baseline values, the average score for the sexual quality of life among women in the intervention and control groups was 61.96 ± 7.51 and 49.01 ± 6.32, respectively. This difference being statistically significant (Adjusted Mean Difference = 12.95; 95% CI = 1.18 to 21.13; $P < 0.001$). Additionally, the average score for women's marital satisfaction in the intervention

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and control groups was 127.96 ± 13.03 and 118.61 ± 12.01, respectively, with this difference also being statistically significant (Adjusted Mean Difference = 9.35; 95% CI = 4.23 to 15.73; *P* = 0.002).

Conclusions The results of the current study indicate that sexual counseling for couples, utilizing the CHARMS model, effectively enhances the quality of sexual life and marital satisfaction for wives of men with myocardial infarction. Therefore, it is crucial to evaluate the sexual quality of life for cardiac patients and their partners in clinical settings and to suggest sexual counseling using the CHARMS model.

IRCT code The trial protocol of this study has been registered in Iranian Registry of Clinical Trials. The registration reference is IRCT20240218061046N1.

Keywords Sexual counseling, Sexual quality of life, Marital satisfaction, CHARMS model, Myocardial infarction

Plain English Summary

Adults with cardiovascular diseases frequently experience chronic illnesses that have an impact on their physical and mental health. The disease's effect on sexual satisfaction and marital relationships is a major concern, as it can also affect other aspects of quality of life. This study assessed the effectiveness of a counseling intervention using the CHARMS model in improving the sexual quality of life and marital satisfaction of wives whose husbands have had a heart attack. A CHARMS-based intervention with 4 principles addresses the sexual and marital relationship empowerment of couples following a severe heart attack. These principles include: (1) Counseling and providing information on the impact of cardiovascular diseases on sexual desires. (2) Counseling and providing information on a healthy sexual life and communication skills strategies with the sexual partner. (3) Counseling on uncovering false beliefs and misconceptions regarding relationship risks and fears. (4) Providing tips and solutions for resuming sexual relations after a severe heart event, addressing sexual and interpersonal challenges.

In this study, participants were randomly allocated into two groups: control (50 couples) and intervention (50 couples). Couples in 6 groups of 8 members each attend counseling sessions based con the CHARMS model, with sessions held weekly and lasting for 60 min. The results of the current study indicate that sexual counseling for couples, utilizing the CHARMS model, effectively enhances the quality of sexual life and marital satisfaction for wives of men with myocardial infarction.

Introduction

One of the most prevalent chronic illnesses and a major global cause of adult mortality and disability is cardiovascular disease [1]. The incidence of this disease doubles with each decade of life. Cardiovascular diseases, with an annual mortality rate exceeding 17 million people globally, rank first worldwide, particularly affecting low and middle-income countries [2]. Official data shows that this problem is also contributing to an increasing trend in mortality rates in Iran [3].

Because cardiovascular diseases are severe and chronic, they create a crisis in the lives of those affected, significantly impacting various dimensions of life [4]. Heart patients often experience sexual dysfunction [5]. People who have had myocardial infarction have been shown to have lower quality and fewer frequency of sexual relationships as well as lower frequency of sexual activity and lower levels of sexual satisfaction [6–8]. Men who have survived heart attacks may experience erectile dysfunction, premature ejaculation, and decreased libido as symptoms of sexual dysfunction [7, 8]. These problems frequently linked to fears of experiencing a sudden cardiac event during sexual activity and misinterpreting normal signs of arousal as symptoms of heart problems [9, 10]. These factors can negatively affect their overall sexual quality of life and marital satisfaction [11].

The marital satisfaction is a multidimensional concept includes factors like compatibility, sexual satisfaction, happiness, and commitment between couples [12]. However, individuals with ischemic heart diseases may face difficulties in their marital relationships due to fear and uncertainty surrounding the illness. On the other hand, research has shown, many spouses of heart patients worry about the repercussions of having sex because they feel they are in a dangerous situation and want to show their partners how much they care [7, 13]. Individuals suffering from heart disease may be uncertain about the effects of sexual activity on their condition [14]. Therefore, sexual education is crucial for patients and should begin during the acute phase of the illness, continuing throughout the healing process [15–17]. However, the results of the Arikan study (2024) showed sexual rehabilitation after heart disease has been largely overlooked, and even discussing sexual issues during medical visits is perceived as difficult by both patients and physicians [8].

Free sexual counseling and an assessment for any sexual concerns should be provided to all patients with cardiovascular diseases, according to the American Heart Association and the European Society of Cardiology. Among the recommended counseling methods by these associations that can be helpful is the CHARMS-based counseling method (Cardiac Health and Relationship Management and Sexuality) [18–21].

A CHARMS-based intervention with four principles addresses the sexual quality of life and marital satisfaction of couples following a major heart attack. These principles include: (1) Counseling and educating on the impact of cardiovascular diseases on sexual desires. (2) Offering advice and information on having a healthy sexual life as well as techniques for effective communication with a partner. (3) Counseling on dispelling myths and misconceptions regarding relationship risks and fears. (4) Addressing interpersonal and sexual difficulties and offering advice and solutions for getting back into a relationship after a serious cardiac event [20, 22].

In Iranian society, the sexual quality of life and marital satisfaction are often overlooked in medical treatment programs and follow-ups for cardiac patients, likely due to the prevailing culture in Iranian families that perceives sexual relationships as personal and private. In addition, research carried out in Iran investigated heart patients' sexual issues in a descriptive manner and intervention studies to improve the quality of their sexual life are limited. According to the content of sexual counseling based on the CHARMS model, it is hypothesized that the educational and counseling program based on this model may enhance the quality of sexual life and subsequently improve marital satisfaction for heart patients and their spouses in Iran. The aim of the current study is to determine the effect of couple counseling based on the CHARMS model on sexual quality of life and marital satisfaction of wives of men suffering from myocardial infarction.

Methods

This two-group randomized clinical trial study with a parallel design was conducted in 2024 in Urmia, in the northwest of Iran.

Inclusion and exclusion criteria

The inclusion criteria for couples in the study include: definite diagnosis of myocardial infarction and a minimum of 6 months since its occurrence in men, first-time heart attack in men, living with the spouse during the study period, no history of mental or emotional trauma in the past 6 months, no history of chronic disease in women, age between 35 and 50 years in spouse, not prohibiting sex in couples based on the opinion of a cardiologistand .The exclusion criteria include pregnant or breastfeeding women and not attending counseling sessions more than once and withdrawing from continued cooperation.

Sample size

According to the study by Baqeri et al. [23], the average sexual satisfaction of spouses in the intervention group before intervention was 2.47 ± 81.30 and after intervention was 2.28 ± 82.70. Considering an alpha of 0.05 and 80% power, the sample size was estimated to be 45 couples in each of the two intervention and control groups. Considering potential sample attrition in each study arm (intervention and control), approximately 50 couples was selected and included in the study.

$$\frac{\left(z_{1-\frac{\alpha}{2}} + z_{1-\beta}\right)^2 \times {\sigma_1}^2 + {\sigma_2}^2}{\left(\mu_1 - \mu_2\right)^2}$$

Data collection tools

The following questionnaires were used to collect data in this research.

Demographic information questionnaire: This tool includes demographic characteristics of the participants such as age, couple 's age, duration of marriage, number of children, education level, couple 's education level, employment status of the couple, family income sufficiency, current contraceptive method, duration of illness, age of first heart attack, medications used, and stage of heart disease in men.

Women's Sexual Quality of Life Questionnaire: This tool assesses the connection between sexual dysfunction and women's quality of life. It comprises 18 items categorized into four main sections: Psychosexual Feelings, Sexual and Relationship Satisfaction, Self-Worthlessness, and Sexual Repression. Scoring utilizes a Likert scale from 1 to 6, indicating responses from strongly agree to strongly disagree. The total score ranges from 18 to 108, with a higher score reflecting better sexual quality [24, 25].

Enrich Marital Satisfaction Questionnaire, comprising 47 questions. The minimum score is 47, while the maximum is 235. Scores below 115 suggest low marital satisfaction, 116 to 230 indicate moderate satisfaction, 231 to 345 reflect high satisfaction, and 346 to 460 represent ideal satisfaction [26].

Validity and reliability of questionnaires

Women's Sexual Quality of Life Questionnaire: This instrument has been translated, validated, and culturally adapted in Iran by Masoumi et al. (2013), demonstrating

good validity, high internal consistency, and high reliability. It had a Cronbach's alpha coefficient of 0.73 and an internal consistency of 0.88 (ICC = 0.88) [27].

The Enrich Marital Satisfaction Questionnaire: The validity and reliability of this instrument in Iran were confirmed by Masoumi et al. (2021) with a validity of 0.86 and a reliability of 0.80 [26].

Sampling and data collection

Samples were selected using convenience sampling and were divided into two groups: intervention (50 couples) and control (50 couples). Participants were assigned to two groups through block randomization, with block sizes of four and six and an allocation ratio of 1: 1 using a computerized random number tabulation. The allocation sequence was conducted by a researcher uninvolved in sampling and data analysis. Therefore, the masking of the researcher and participants was maintained. The allocations were hidden by writing the type of intervention on a piece of paper and placing it in sequentially numbered opaque envelopes. The envelopes were opened in the order of the participants' arrival, and they were subsequently assigned to either the intervention or control groups.

The sampling setting was Seyyed Al-Shohada Hospital in Urmia. It is worth noting that because Seyyed Al-Shohada Hospital is the only cardiovascular hospital in Urmia, heart patients go there for care and treatment. Therefore, convenience sampling was employed from that center among patients willing to participate in the study. To minimize the risk of selection bias and enhance the generalizability of the results, the samples were divided into two groups: control and intervention, using random allocation conducted by an individual uninvolved in sampling and data analysis.

Researchers visited the Seyyed Al-Shohada Hospital after obtaining official approval from the Ethics Committee of Urmia University of Medical Sciences. The researcher obtained the phone numbers of the patients who had at least 6 months of myocardial infarction from the information archive unit and after checking the inclusion criteria, 100 couples were included in the study. The diagnostic criteria for myocardial infarction in men included clinical symptoms assessed by a cardiologist and ST elevation observed in the electrocardiogram (ECG).

After contacting the participants by the researcher (first author), introducing the research, explaining the objectives and methods to the patients, eligible individuals were selected and were randomly divided into control and intervention groups. Upon their agreement to participate, informed written consent was obtained from both men and their spouses (by the first and corresponding authors). The couples of the control group received routine care (Receive training on heart attack risk symptoms, medication administration, exercise importance, and healthy eating from the cardiologist and nurse), and the people of the intervention group, in addition to routine care, participated in group counseling sessions based on the CHARMS method.

The intervention consisted of six sessions. Couples were divided into six groups: four groups with eight couples (16 people) each, and two groups with nine couples (18 people) each. The sessions were held weekly for 60 min. First, the demographic information form was completed by the control and intervention groups, and then other questionnaires are completed by the women of both groups (pre-test). One month after the end of the intervention, the questionnaires were completed again by women in the control and intervention groups (post-test).

Interventions at the Cardiac Rehabilitation Center of Seyed Al-Shohada Hospital were conducted in one of the rooms with the presence of patients suffering from heart attacks and their spouses. The intervention was in the form of discussions, group consultations, and individual consultations if needed, which was presented at the end of the session. Before each session, the participants were contacted by phone to coordinate the next session, and if they had any questions, the researcher answered them. Researchers were emphasize the importance of couples attending counseling sessions together.

The sessions was managed by researchers who have the necessary skills and knowledge regarding sexual counseling. The topics of each session was presented to the participants by the researchers. In this regard, the researcher was facilitate and guide the sessions. During the intervention, tools such as pamphlets, PowerPoint presentations, speeches, and couples counseling were used to enhance the effectiveness of the intervention program.

Content of the intervention program

The intervention program was designed based on the CHARMS empowerment program. This intervention includes: (1) sexual education and counseling for spouses of patients with heart attacks, (2) educational and supportive intervention for heart attack patients by researchers and nurses in the cardiac rehabilitation program, (3) delivering informative booklets to patients, and (4) providing pamphlets on the topics of each session to increase awareness among heart attack patients and their spouses [20, 22].

The content of each counseling and educational session was compiled by the research team from books, articles, websites, and reputable sources such as: European

Society of Cardiology and American Heart Association [28–32] (Table 1).

After preparing the counseling content for each session, we validated the developed content using the Delphi method based on feedback from reproductive health and cardiology experts at Urmia University of Medical Sciences. These experts possessed the necessary knowledge and skills in sexual counseling and essential care for heart patients. We conducted three rounds of questionnaires with a panel consisting of three cardiology specialists and three reproductive health specialists (The characteristics of Delphi participants are given in Appendix 1).

Strategies to promote adherence

To reduce dropout and to increase adherence to the counselling sessions, participants were informed of the importance to attend all sessions. Adherence to the counselling sessions was controlled by the researchers, and registered in a personal training diary. Strategies such as door-to-door transportation and a gift, were offered to participants in both groups to improve adherence.

It should be noted that due to the drop in the sample size, the data of 44 couples in the control group (one case of a man suffering from a heart attack again and being hospitalized, five cases of non-attendance to complete the questionnaires despite follow-up and repeated calls by the researcher) and 43 couples in the intervention group (two case of moving to another city, five cases of non-participation in counseling sessions for more than one session) was included in the statistical analysis. Notably, the data analyst was blinded to the group allocation (Fig. 1).

Data analysis

The analysis of the present study's data was conducted using the Statistical Package for the Social Sciences (SPSS, Inc., Chicago, IL, USA, version 21.0). The normal distribution of quantitative data was examined using the Kolmogorov–Smirnov test, and all the data were found to have a normal distribution. Demographic variables between the two groups were compared by Independent t-test, Chi-square, and Fisher's exact tests. To compare the mean changes within groups before and after the intervention, the Student's paired t-test was conducted. The differences in sexual quality of life scores and marital satisfaction scores between the two groups were evaluated by Independent t-test before the intervention, and a general linear model (the ANCOVA) was used after adjusting for the baseline values (demographic criteria) to compare the two groups after the intervention. A significant level of $P < 0.05$ was considered in all statistical tests.

Table 1 Contents of counseling sessions based on the CHARMS method

No	The content of the sessions	Type of consultation
First	With a focus on establishing communication and building trust and collaboration between couples, evaluating the mental, emotional, and physical health of individuals, identifying their sexual problems, informing couples about the session structure and setting goals, educating on the sexual cycle, and familiarizing them with sexual performance and the internal and external organs of men and women. Defining sexual desire, arousal, lubrication, and orgasm, as well as familiarizing them with the sexual response pattern and explaining the physiological changes in men and women during sexual activity, including sexual positions.	Group
Second	Counseling and providing information about cardiovascular diseases and symptoms, general and sexual consequences on the individual and their impact on the life of patients.	Group
Third	Counseling and providing information on the impact of cardiovascular disease on reducing sexual desire, lack of sufficient communication skills in sexual relationships, misconceptions about sexual relationships, providing information and education on coping with shame and deciding to resolve it, providing information on sexual aspects of life and training strategies to enhance marital satisfaction, providing necessary information and education on sensory focus techniques. Providing information on expressing feelings and beliefs about sexual behaviors and teaching problems-solving skills.	Group
Fourth	Consultation and provision of information on identifying the root causes of decreased sexual desire, offering solutions, strengthening empathetic communication, sexual discourse with a partner, explaining the secrets of sexual attraction, assisting in maintaining verbal and emotional relationship with a spouse, emphasizing the importance of lovemaking and romance, warning signs of heart disease during or after intimacy.	Group
The fifth	Collaborative contract writing technique to articulate needs and expectations in sexual relationships, clarifying expectations, correcting misconceptions and myths about sexual relationships, guidance on creating a structured timeline for noting thoughts and mindset during desirable and unpleasant sexual experiences, aversion, muscle tension, and emotional pressures. Household responsibilities, addressing potential inquiries.	Group
The sixth	Review of previous materials and nutritional recommendations, sleep hygiene education, performing stretching exercises and sports, recommending daily walks, bedroom environment, teaching alternative positive thinking and stopping negative thoughts.	Group

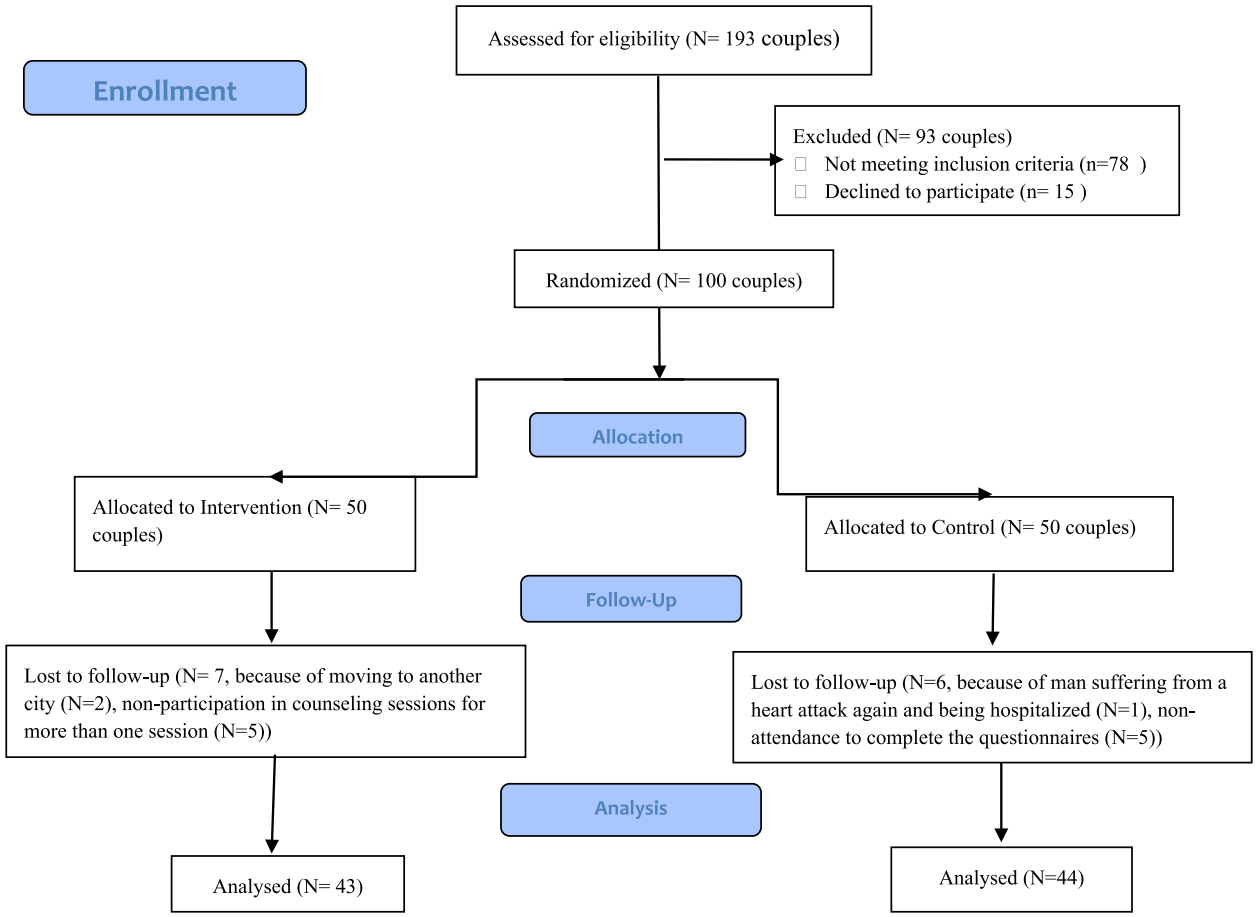

Fig. 1 CONSORT flow diagram

Results

The demographic and clinical characteristics of the two groups were relatively similar ($P > 0.05$). The average age of women in the intervention group was 45.16 ± 5.90 and the control group was 44.75 ± 4.94 years. Most of them were housewives and had two children. The contraceptive method used by most of the participants was condom (Table 2).

Before the intervention, there was no statistically significant difference between the averages of various dimensions and the total score of sexual quality of life in women between the intervention (48.62 ± 6.62) and the control group (49.54 ± 6.85) ($P = 0.52$). However, according to the ANCOVA, after the intervention and after adjusting for the baseline values (demographic criteria), the averages of the different dimensions of sexual quality of life (excluding the dimension of Psychosexual Feelings) and the total score of sexual quality of life in women between the intervention group (61.96 ± 7.51) and the control group (49.01 ± 6.32) were statistically significant (Adjusted Mean Difference = 12.95; 95% CI = 1.18 to 21.13; $P < 0.001$) (Table 3).

The difference in the mean across various dimensions of quality of life before and after the intervention was not significant in the control group (Paired t-test, $P > 0.05$). However, in the intervention group, all dimensions of quality of life demonstrated a statistically significant difference before and after the intervention (Paired t-test, $P < 0.05$). The difference in the mean total score of sexual quality of life within the control group before and after the intervention did not reveal a statistically significant difference (df = 43, $P = 0.38$). In contrast, the difference in the mean total score of sexual quality of life within the intervention group, before and after the intervention, demonstrated a statistically significant difference (df = 42, $P < 0.001$).

Before the intervention, there was no statistically significant difference in the mean scores of marital satisfaction between the control and intervention groups ($P = 0.37$). However, according to the ANCOVA, after the

Table 2 Characteristics of participants

Variable	**Intervention (*n* = 43) Mean ± SD**	**Control (*n* = 44) Mean ± SD**	***P*-value**
Women's age	45.16 ± 5.90	44.75 ± 4.94	0.724*
Men's age	48.6 ± 4.51	47.5 ± 5.5	0.618 *
Duration of marriage (year)	25.11 ± 5.75	25.50 ± 5.70	0.756*
Variable	**Intervention (*n* = 43) N (%)**	**Control (*n* = 44) N (%)**	***P*-value**
Number of children			0.81**
1	5(11.6)	7(15.9)	
2	26(60.5)	23(52.3)	
3	7(16.3)	8(18.2)	
4	4(9.3)	6(13.6)	
5	1(2.3)	0(0)	
Women's education			0.62***
Non-university education	36(87.9)	39(88.7)	
University education	7(16.3)	5(11.4)	
Men's education			0.31**
Non-university education	37(86)	40(90.9)	
University education	6(14)	4(9.1)	
Women's jobs			0.61***
Employed	9(20.9)	12(27.3)	
Housewife	34(79.1)	32(72.7)	
Contraception method			0.62**
Condom	14(32.6)	21(47.7)	
Oral contraceptive	17(39.5)	13(29.5)	
Injectable contraceptives	2(4.7)	4(9.1)	
IUD	5(11.6)	3(6.8)	
None	5(11.6)	3(6.8)	

* Independent t test, ** Fisher's exact test, *** Chi-square

Table 3 The average total score of sexual quality of life among women, before and after the intervention in both the control and intervention groups

	Variable		**Intervention (*n* = 43) Mean ± SD**	**Control (*n* = 44) Mean ± SD**	***P*-value***	**AMD† (CI 95%)**
Before the intervention	Dimensions of the quality of sexual life	Psychosexual Feelings	12.26 ± 2.73	13.39 ± 3.05	0.072*	−1.13 (−3.7 to 1.1)
		Sexual and Relationship Satisfaction	13 ± 3.13	12.27 ± 2.77	0.25*	0.73 (− 4.18 to 3.47)
		Self-Worthlessness	11.93 ± 2.94	12.37 ± 3.18	0.53*	−0.44 (− 2.15 to 6.83)
		Sexual Repression	11.44 ± 2.61	12.73 ± 0.85	0.85*	−1.29 (− 3.65 to 4.52)
	Total score		48.62 ± 6.62	49.54 ± 6.85	0.52*	−0.92 (−6.5 to 7.32)
After the intervention	Dimensions of the quality of sexual life	Psychosexual Feelings	13.91 ± 3.20	13.46 ± 3.01	0.54**	0.45 (−3.9 to 2.1)
		Sexual and Relationship Satisfaction	17.32 ± 2.32	12.04 ± 2.41	0.001**	5.28 (3.37 to 8.21)
		Self-Worthlessness	15.97 ± 2.60	11.01 ± 3.06	0.001**	4.96 (2.27 to 9.37)
		Sexual Repression	14.02 ± 3.59	11.21 ± 2.32	0.001**	2.81 (1.43 to 9.06)
	Total score		61.96 ± 7.51	49.01 ± 6.32	0.001**	12.95(1.18 to 21.13)

The independent t test was used for comparing the groups before the intervention; after the intervention, the groups were compared using the general linear model (ANCOVA) after adjusting for the baseline variables (demographic criteria)

* Independent t test, †Adjusted mean difference (95% Confidence Interval), ** ANCOVA

intervention and after adjusting for the baseline values (demographic criteria), a statistically significant difference was observed between the average scores of marital satisfaction in the intervention group (127.96 ± 13.03) and the control group (118.61 ± 12.01) (Adjusted Mean Difference = 9.35; 95% CI = 4.23 to 15.73; $P = 0.002$) (Table 4).

The mean score of marital satisfaction within the control group before and after the intervention did not show a statistically significant difference (Paired t-test, df = 0.43, $P = 0.43$). The difference in the average score of marital satisfaction within the intervention group, before and after the intervention, showed a statistically significant difference (Paired t-test, df = 0.42, $P = 0.001$).

Discussion

The study aimed to assess the impact of couples counseling using the CHARMS model on the sexual quality of life and marital satisfaction of wives of men with myocardial infarction. The intervention group exhibited higher average sexual quality of life post-intervention compared to the control group, with a statistically significant difference, indicating the positive influence of couple counseling based on the CHARMS model on enhancing women's sexual quality of life.

Several studies show the positive effects of sexual counseling on improving the sexual quality of life in different people. The study by Mohammadi et al. (2017) aimed to assess the impact of sexual counseling on correcting sexual dysfunctional beliefs to enhance the sexual quality of life for pregnant women. The findings indicated that addressing sexual dysfunctional beliefs during pregnancy led to an improvement in the overall sexual quality of life for pregnant women [33]. Similarly, the research conducted by Tunce et al. (2023) focused on the effects of sexual counseling using the PLISSIT model on the sexual performance and sexual quality of life for women undergoing open-heart surgery. Following the intervention, women in the counseling group showed significantly higher average scores in sexual performance and sexual quality of life compared to those in the control group. The intervention group experienced notable enhancements in all aspects of the sexual performance questionnaire, such as Desire, Arousal, Orgasm, Lubrication, and Satisfaction (excluding pain during intercourse) [34]. In Abdelhakm et al.'s (2018) study, menopausal women who underwent sexual counseling based on the PLISSIT model demonstrated a higher average score in sexual quality of life compared to the control group. The study revealed a significant difference in all dimensions of sexual quality of life before and after the counseling program between the two groups [35], aligning with the outcomes of the current study.

In the current study, the average marital satisfaction score in the intervention group, as opposed to the control group, exhibited a statistically significant difference before and after the intervention. Additionally, following the intervention, the average marital satisfaction score among women in the intervention group was notably higher than that of women in the control group. The study by Shahin et al. (2021) aimed to assess the impact of nursing counseling guided by a BETTER model on the marital satisfaction of women with breast cancer. The results indicated that the average marital satisfaction score in the intervention group was significantly higher than the control group [36]. Similarly, Mehrabi's study (2021) demonstrated that Bowen's Family Therapy Approach training led to a notable increase in the marital satisfaction of married women [37]. Furthermore, a systematic review by Bafrani et al. (2023) supported the idea that psychological interventions in couples can enhance their marital satisfaction [38], aligning with the findings of the current study. However, a study focusing on the effect of cognitive-behavioral counseling on the marital satisfaction of infertile women revealed that education and counseling using a cognitive-behavioral approach did not result in a significant change in marital satisfaction levels for infertile women [39]. This discrepancy may be attributed to differences in the characteristics of the study populations (infertile women versus wives of men with heart disease).

A review of multiple studies indicates that counseling interventions enhance the quality of women's sexual life and marital satisfaction in most instances. However,

Table 4 The average scores of women's marital satisfaction before and after the intervention in the control and intervention groups

Variable	Intervention ($n = 43$) Mean ± SD	Control ($n = 44$) Mean ± SD	*P*-value	AMD† (CI 95%)
Marital satisfaction (Before the intervention)	115/46 + 13/41	118/02 + 13/58	0.37*	−2.56 (−4.44 to 8.72)
Marital satisfaction (After the intervention)	127.96 ± 13.03	118.61 ± 12.01	0.002**	9.35(4.23 to15.73)

The independent t test was used for comparing the groups before the intervention; after the intervention, the groups were compared using the general linear model (ANCOVA) after adjusting for the baseline variables (demographic criteria)

* Independent t test, †Adjusted mean difference (95% Confidence Interval), ** ANCOVA

the primary distinction between the current study and the reviewed research is the type of model utilized. In this study, the researchers employed the CHARMS-based model, a comprehensive intervention designed to deliver sexual counseling to individuals with heart conditions and their partners. Through counseling based on this model, participants were educated on the impact of cardiovascular disease on sexual desire, communication strategies with sexual partners, dispelling misconceptions about risks and fears associated with sexual activity, and resuming sexual activity after a cardiac event. This approach offers a holistic perspective on couples' sexual health, ultimately focusing on enhancing the quality of sexual life and marital satisfaction [20, 22]. Therefore, in various societies, including those with Iranian culture where discussing sexual issues is taboo and sexual counseling is not provided to patients, receiving sexual counseling based on the comprehensive model of CHARMS can effectively enhance the quality of patients' sexual lives.

Based on the researcher's search, the current study is the first clinical trial to implement sexual counseling intervention using the CHARMS model for men with heart disease and their partners worldwide, highlighting a key strength of this study. However, there are some limitations to the current research. Firstly, as no previous clinical trials were found focusing on sexual counseling with the CHARMS model, the discussion and comparison of results were limited, leading the researcher to compare it with other intervention models. Secondly, given the sensitive nature of sexual relationships and cultural/religious constraints in Iranian society, individuals may struggle to openly discuss their sexual concerns. Therefore, the researcher made efforts to establish trust with the participants during the study.

Conclusion

The study's findings indicate that couples counseling using the CHARMS model effectively enhances the sexual quality of life and marital satisfaction of women married to men with myocardial infarction in IRAN. This suggests that incorporating this approach in sexual counseling, as a non-pharmacological intervention, can help reduce marital issues and enhance the sexual life quality and marital satisfaction of couples dealing with heart disease. Therefore, it is recommended to focus on the sexual well-being of individuals with heart disease and their partners in heart clinics, offering them sexual counseling based on the CHARMS model to enhance sexual life quality and marital relationships.

Due to the scarcity of similar studies on the application of sexual counseling based on the CHARMS model in heart patients, it is recommended that clinical trials in this area be carried out across various cultures in future research. Additionally, employing qualitative approaches in future studies can help capture participants' deeper insights on sexual health issues within the context of counseling, which may be particularly beneficial in culturally conservative settings akin to Iran.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s40834-025-00337-8.

Supplementary Material 1.

Acknowledgements
All participants in the research are appreciated.

Protocol
The protocol of the current research has been published in BMC Reproductive Health journal [40].

Disclosure statement
No potential conflict of interest was reported by the author(s).

Authors' contributions
SR, KKH, SB, DGH and AY participated in conceptualization and methodology. AY and SR contributed in formal analysis. AY, SR and DGH participated in investigation and writing-original draft preparation. SR, KKH, SB, DGH and AY participated in writing-review and editing. All authors read and approved the final manuscript.

Funding
This study was funded by Urmia University of Medical Sciences.

Data availability
No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate
The study was approved by the Ethics Committee of Urmia University of Medical Sciences IR.UMSU.REC.1402.101. Participants were provided with written informed consent and were approached to explain the study aims, risks, and benefits. At the time of recruitment, it was explained that the participants' characteristics were not shared because of confidentiality.

Competing interests
The authors declare no competing interests.

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Received: 3 June 2024 Accepted: 14 January 2025
Published online: 23 January 2025

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