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Original Article

Effect of Couple Counseling Intervention based on the BETTER Model on the Sexual Health of Diabetic Women

Arya Abyar[1], Saeed Zamani[2], Narges Zamani[3*]

1. PhD in Psychology, Department of Psychology, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran
2. MA Student, Department of Clinical Psychology, Faculty of Medical Sciences, Hamedan Branch, Islamic Azad University, Hamedan, Iran
3. PhD in Health Psychology, Islamic Azad University, Hamedan branch, Hamedan, Iran

***Corresponding author:**
Narges Zamani, PhD in Health Psychology, Islamic Azad University, Hamedan branch, Hamedan, Iran
Tel: +989185410219
Email: Drnargeszamani1367@iauh.ac.ir

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Abstract

Background and Objective: Currently, the substantial number of women of reproductive age living with diabetes is viewed as a critical issue faced by policymakers. Therefore, the present study aimed to assess the effect of a couple counseling intervention based on the BETTER model on the sexual health of women with type 1 diabetes.

Materials and Methods: The present study was conducted based on a quasi-experimental pre-test-post-test design with a control group and a three-month follow-up. The statistical population of the study consisted of all married women with type 1 diabetes in Hamedan who had a medical record at the Diabetes Association. Of these, 40 cases were randomly assigned to two experimental and control groups using convenience sampling. They answered the Halbert Women's Sexual Performance Index, Fatigue Severity, Sexual Desire, and Sexual Fulfillment Questionnaire as a pre-test-post-test and three months after the intervention. The intervention group received four training sessions for 45-90 minutes according to the BETTER model, while the control group did not receive any training during this period. The analyses were performed using SPSS software (version 25) at a significance level of $P<0.05$.

Results: The results revealed that couple counseling based on the BETTER model was effective in sexual health, sexual fatigue, sexual desire, sexual fulfillment, and failure in sexual relationships, and this effect persisted for three months after the intervention.

Conclusion: As evidenced by the findings of this study, the couple counseling model based on the BETTER model proved to be successful in notably enhancing the sexual function of diabetic. Considering the low quality of life of these individuals, it is also suggested that this training be used in diabetes support groups. Moreover, regarding the interventions of the present study, psychosocial and multidisciplinary interventions should be given more attention in a larger sample size.

Keywords: BETTER, Chronic disease, Diabetes, Sexual health

Background

Health is one of the most important pillars of life and a fundamental human right [1]. Enjoying a healthy life is the right of all human beings, and this issue relies on understanding the factors and aspects that influence human health in various ways [2]. One of the important categories in the discussion of individual health is paying attention to their fertility [3]. Reproductive health encompasses a set of physical, mental, cultural, and social aspects related to the reproductive system and its function [4]. This area of health includes a crucial component of public health, especially women's health, which plays a key role in women's health [5]. Research illustrated that reproductive health problems are responsible for approximately 46% of diseases in women of reproductive age [6, 7]. Reproductive health is one of the necessary prerequisites for the achievement of sustainable development in today's societies [3], and numerous international organizations, such as UNICEF, the United Nations Population Fund, and the World Health Organization, have highlighted its significance [4]. The importance of this health domain is so paramount that it is now recognized in scientific communities as reproductive rights, which fall under the umbrella of human rights. Its advancement is regarded as a crucial measure in ensuring the health of the family and society [8]. Nevertheless, chronic diseases, such as diabetes, cardiovascular diseases, and diseases of the nervous system, can negatively affect the reproductive health of individuals in numerous ways [9]. Meanwhile, the reproductive health and sexual life of diabetic patients have always been challenging. Diabetes, which has been called a silent epidemic, is a major and widespread health problem whose prevalence has increased significantly in recent years, especially

in developing countries [10]. Diabetes is a metabolic disorder characterized by chronically elevated blood sugar and impaired carbohydrate, protein, and fat metabolism. Normally, food in the stomach is converted into glucose or blood sugar, and sugar enters the bloodstream from the stomach. The pancreas secretes insulin, which helps sugar from the bloodstream enter the body cells, keeping blood sugar levels normal [11,12].

Diabetes, especially type 1 diabetes, like other chronic and debilitating diseases, causes serious problems for the affected individuals, consequently influencing all aspects of their lives [13]. For a diabetic person, psychological and social problems may arise due to restrictions in diet and activity, the need for careful and continuous self-care, and the possibility of serious physical complications, such as kidney, eye, heart, and brain problems [14]. These patients commonly experience feelings of failure and hopelessness due to their struggle with the disease and its treatment planning; consequently, their psychological and social well-being is adversely affected, and many of them report feelings of fear, anger, and guilt related to the disease. In addition, they frequently find themselves lacking the motivation to prioritize self-care and manage the disease effectively [15].

In today's medical care, recovery from chronic diseases is impossible; however, death is not imminent; therefore, controlling chronic diseases is of particular importance, and one of the goals of medical care is to optimize life expectancy [16]. Chronic diseases exert a detrimental effect on patients' life expectancy since they make them susceptible to stress and mood disorders. Today, addressing the life expectancy of patients with chronic diseases as a framework for providing appropriate services and recognizing the effects of the disease on aspects of life expectancy based on their individual needs seems necessary and is one of the dire needs of patients [17].

Type 1 diabetes often becomes an uncontrollable disease between the ages of 20 and 45, and its prevalence is higher in women than in men [18]. Nonetheless, there is no definitive cure for this disease, and the goal of treatment in these patients is to prevent the progression and complications of the disease. Furthermore, diabetes leads to retinopathy, nephropathy, and neuropathy (reduction or loss of pain sensation), diabetic nephropathy and kidney disease, diabetic retinopathy, diabetic neuropathy, atherosclerotic cardiovascular diseases, coronary artery disease, stroke, and non-traumatic lower limb amputation [19]. These complications, in turn, affect women's reproductive health and have profound effects on their lives in such a way that many of these women fail in their marital life and are on the verge of depression [20]. The World Health Organization has also recognized that chronic diseases and their treatments can significantly impact an individual's reproductive health [4].

It seems that the disruption in the reproductive and sexual health of those suffering from this disease, in addition to direct consequences, is the result of one's psychological reactions to their illness and disability, as well as the side effects of taking certain medications [21]. These disorders are so common that it is argued that they may be observed at any time during the course of the disease, even in the early stages of the disease [22]. The American Association of Reproductive Health [23] also stated that women suffering from debilitating diseases are at greater risk of domestic and sexual violence than healthy women. Therefore, the Centers for Disease Control and Prevention [24] classifies these women as at risk for sexually transmitted infections, such as hepatitis B, C, and HPV [25]. According to research conducted by the American Diabetes Association, 89% of women with diabetes suffer from irregular menstruation. They have found psychological stress, depression, and medication and insulin use to be effective in causing menstrual disorders in women [26].

Therefore, the high prevalence and specific nature of chronic diseases, such as unpleasant symptoms and drug side effects, the multiple causes of the disease and the lack of a definitive treatment for it, the non-fatal nature of the disease, and consequently, a long life with this defect (life expectancy close to normal in sufferers), have highlighted the necessity of paying close attention to reproductive health programs in an attempt to improve the quality of life of women with this disease in the health policies of countries [27]. It is worth noting that most reproductive health disorders of these women are controllable or can be effectively managed. This issue emphasizes the need for greater attention to interventions and care programs in the field of reproductive health issues of women with diabetes. Investment in ensuring the reproductive health of these women is one of the main paths to achieving sustainable development due to their dual role in promoting the health of society and future generations. It has also been demonstrated that ensuring reproductive health in these women is related to their quality of life and has profound effects on them and their families [28].

This is while in our country, despite numerous measures taken to treat and improve the acute symptoms of those suffering from this disease, due to the heavy financial burden resulting from the treatment and the spread of the symptoms of this disease, the reproductive health and sexual life of

these patients have received less attention from policymakers and therapists [29]. Therefore, it is necessary to pay more attention to this area of health and identify the specific concerns and worries of these women [30]. People's worries are associated with effects and consequences on their behavior and health, so much so that many experts believe that most serious problems in people's health arise from their mental worries and concerns [31].

These concerns are felt more in a specific group, such as women with this disease who face a wide array of changes and problems; moreover, studies have demonstrated a high level of concerns in the affected women [32]. For instance, Sonkurt et al. [33] reported that 85% of these women suffer from varying degrees of worry, and these mental worries and concerns reduce their self-esteem and sense of worth. Although these worries may not be recognized as an acute health problem for these women, their existence will be a threat to their future health, and even in some cases, it will be a prelude to the initiation of high-risk behaviors, such as addiction and suicide.

Women with this disease are under pressure from various sources, such as their spouse, children, and society; nonetheless, they are usually not equipped with appropriate information and tools to control their worries [34]. Therefore, their concerns should be taken into account when designing and implementing health programs, and our understanding of the issues that these patients worry about should be increased [35]. However, the findings of the study by Miller et al. in 2014 revealed that one of the known issues to cause concern in women with diabetes is related to their reproductive health and sexual life [36].

Objectives

In fact, to improve the effectiveness of health promotion efforts for women with type 1 diabetes in settings with limited resources, it is necessary to identify their specific concerns and needs and determine the impact of a couples counseling intervention based on the BETTER model on the sexual health of women with type 1 diabetes.

Materials and Methods

The present study was conducted based on a quasi-experimental pre-test-post-test design with a three-month follow-up. The statistical population of the study consisted of all married women with type 1 diabetes in Hamedan with a medical record at the Diabetes Association. Of these, 40 cases were randomly assigned to two experimental and control groups using convenience sampling. The inclusion criteria for the study were (1) an age range of 20-45 years old, (2) being married and living with their spouse (not about to get divorced), (3) having a confirmed diagnosis of type 1 diabetes (membership in the Diabetes Association requires written confirmation of the disease by an endocrinologist or obstetrician), (4) absence of any underlying or chronic disease other than type 1 diabetes, (5) being at a stage of type 1 diabetes that allows them to perform normal activities (EDSS $\geq$ 7), (6) not receiving specific treatment (including psychotherapy or educational classes and sex therapy) for sexual problems; (7) absence of any sexual dysfunction in the spouse according to the individual's statement, and (8) the availability of individual's spouse for at least the next four months. On the other hand, the exclusion criteria for the study entailed (1) the occurrence of any physical or mental illness, confirmed by a physician, in the individual or his/spouse that affects their sexual function, (2) recurrence or attack of diabetes (such as amputation or a problem in the body system that requires immediate treatment and absolute rest) during the study, (3) participant's unwillingness to continue the study (the individual's absence from the counseling session), (4) participation in other educational sessions or sexual counseling during the study, and (5) the presence of other severe psychiatric disorders that require pharmaceutical treatment (clinical and semi-clinical disorders with a life-long duration).

Research Instruments

1. Sexual Fatigue Questionnaire (FSS): This 9-item scale was initially developed by Krupp, LaRocca, Muir-Nash, and Steinberg in 1989 to measure the severity of fatigue. Initially, 28 questions were created for patients with multiple sclerosis and lupus, and then 9 questions were designed for people with chronic diseases and were used for psychometric analysis. In this questionnaire, the individual gives a score between 1 and 7 based on the degree of agreement with each of the 9 items. A higher score indicates a higher degree of agreement with the individual. Therefore, the total score of the individual from the 9 items of the questionnaire is 7, and the maximum is 63, which is divided by 9, and the individual's fatigue severity score is calculated. This score varies from 1-7 for each individual, with a score of 2.8 or less being regarded as mild fatigue, a score between 2.8 and 1.5 as moderate fatigue, and a score of 1.5 or higher as severe fatigue. The internal consistency of this scale was calculated by the designers of the questionnaire, and its Cronbach's alpha was 0.94 [37]. This questionnaire was translated by Shahvarughi-Farahani, A'zimian, Fallahpour, and Karimlou in 2012. In a non-experimental and

methodological study, 50 Persian-speaking individuals (38 women and 12 men) with multiple sclerosis and 30 healthy individuals (18 women and 12 men) were selected by simple and non-probability sampling from the clients of Sina Clinic from 2001 to 2007, and they answered the Fatigue Severity Scale and SF-36 questionnaires. The repeatability study was conducted on two occasions with a maximum interval of three weeks. The internal consistency of the items, face, convergent, and discriminant validity of the FSS questionnaire were examined, and the results demonstrated that the internal consistency of the items of this questionnaire was 0.96 by calculating the Cronbach's alpha coefficient, indicating that the items of the above scale evaluate a concept. The correlation of each item with other items, after correcting for overlap, was higher than the desired level of 0.4. The ICC coefficient for examining the relative repeatability of the Persian version of the Fatigue Severity Scale across test times was 0.93 and higher than the acceptable value of 0.7 [38].

2. Hurlbert Index of Sexual Desire (HISD): This questionnaire was developed by Hurlbert in 1992 and has been used in many international studies. This questionnaire consists of 25 items that measure sexual desire [39]. The reliability of the sexual desire questionnaire was 0.86 using the test-retest method. The internal validation of this questionnaire was assessed by Yousefi, Farsani, Shakiba, Hemmati, and Nabavi Hesar in 2013 [40].

3. Standard Sexual Function Index (FSFI) Questionnaire: The Cronbach's alpha coefficient in the study by Rosen et al. [41] was 0.70. The internal reliability of the scale and subscales was obtained by calculating the Cronbach's alpha coefficient in the study by Mohammadi, Heidari, and Faghihzadeh [42], which was calculated for all individuals ≤ 70.

4. Hurlbert Index of Sexual Assertiveness (HISA): This questionnaire was developed by Hurlbert. It consists of 25 questions, and a 5-point Likert scale was used to select its options. In the implementation of HISA, the test-retest reliability was 0.86 [39]. The internal validation of this questionnaire was assessed by Yousefi et al. [40], and it exhibited a structured content validity with an internal consistency of 0.91.

Results

In this section, in order to achieve the quantitative objectives of the research, information from 36 participating patients has been prepared and arranged using descriptive and analytical tests, respectively.

Table 1. Frequency distribution of age of the study units in the two intervention and control groups

Group Age	Experimental		Experimental group	
	Number (n)	Percent (%)	Number (n)	Percent (%)
30 >	3	16.67	3	16.67
30-34	2	11.11	3	16.67
35-39	4	22.23	3	16.67
40-44	3	16.66	4	22.23
45 ≤	6	33.33	5	27.78
sum	18	100	18	100
Test result	Independent t-test : T = -0.38 df= 34 p = 0.59			

Table 2. Frequency distribution of disability severity in the two intervention and control groups

Group EDSS	Experimental		Experimental group	
	Number (n)	Percent (%)	Number (n)	Percent (%)
1	2	11.11	3	16.66
2	4	22.23	5	27.78
3	5	27.78	4	22.23
4	3	16.66	3	16.66
5	4	22.23	3	16.66
sum	18	100	18	100
Test result	Independent t-test: T = -1.43 df= 34 P=0.19 Not meaningful			

As illustrated in Table 2, the disability severity index score in more than half of the subjects in both groups was moderate to high. The independent t-test result also displayed that there was no statistically significant difference between the disability severity scores of the individuals in the two study groups, and

they were homogeneous in terms of disability severity.

Table 3. Frequency distribution of sexual fatigue severity and sexual desire and fulfillment in the two intervention and control groups

Fatigue severity		Experimental		Experimental group	
		Number (n)	Percent (%)	Number (n)	Percent (%)
FSS	1- 2/8 (mild fatigue)	8	44.44	9	50
	2/8- 8 (moderate fatigue)	10	55.56	9	50
Sum		18	100	18	100
		Independent t-test: T=1.460 df= 34 P=0.07			
HISD	Good sexual desire	3	16.67	4	22.23
	Average sexual desire	8	44.44	7	44.44
	Low sexual desire	7	38.88	7	44.44
	Sexual desire plural	18	100	18	100
		Independent t-test: T=1.47 df= 34 P=0.58			
Sexual Entitlement		SD ± Mean		SD ± Mean	
HISA	Pretest	94.74±18.64		94.11±18.97	
	Posttest	97.35±18.02		92.35±19.21	
	Follow	97.54±18.26		93.84±20.32	
	Test result	F=9.01 P=0.06		F=0.70 P=0.39	

As displayed in Table 3, most participants in the intervention group had moderate fatigue. However, in the control group, they were equally mild and moderate in terms of fatigue intensity. The results of the independent t-test also showed that the two study groups were homogeneous in terms of fatigue intensity.

Table 4. Distribution of sexual function index in the stages before, two, and three months after the intervention in the two intervention and control groups

Sexual Entitlement		SD ± Mean	SD ± Mean
FSFI	Pretest	24.85±3.65	24.11±3.64
	Posttest	29.74±2.89	25.30±3.38
	Follow	28.54±2.31	14.30±3.19
	Test result	F=111.98 P< 0.001	F=0.37 P< 0.84

Table 5. Comparison of the sexual function index at different points before and after the intervention in the intervention groups

Group	Time	Experimental	
		Average difference	P-value
Pretest	Posttest	- 4.56	P< 0.001
	Follow up	- 4.78	P< 0.001
Posttest	Follow up	- 0.22	P=0.42

Table 6. Frequency distribution of fatigue severity (FSS) in the two intervention and control groups, 3 months after the intervention

Group FSS	Experimental		Experimental group	
	Number (n)	Percent (%)	Number (n)	Percent (%)
1- 2.8 (mild fatigue)	7	38.88	8	44.44
2.8 – 5 (moderate fatigue)	11	61.11	10	55.56
Sum	18	100	18	100
SD ± M	3.65 ± 0.78		3.13 ± 1.06	
Test result	Independent t-test: T = 0.53 df= 34 P=0.53		Not meaningful	

The above table indicates that most of the subjects in the intervention and control groups had moderate fatigue.

Discussion

This study aimed to assess the effect of the couple counseling intervention based on the BETTER model on the sexual health of women with diabetes. Given that, based on a review of the literature, demographic characteristics, obstetric history, and disease status of diabetics were identified as possible influencing factors on the outcomes of this study, including sexual performance and satisfaction [43, 44], an attempt was made to examine all participants in terms of these variables. Comparison of demographic, obstetric, and clinical characteristics of the disease in the intervention and control groups demonstrated that participants in both intervention and control groups were compared in terms of the mentioned characteristics, and in none of the cases was there a statistically significant difference, and they were homogeneous in terms of all these variables. Therefore, these variables did not act as a confounding factor.

The mean age scores of participants in the intervention and control groups were 6.68±32.28 and 7.75±33.78, which were almost similar to the mean age in the study by Merqat Khoei et al. (8.36±3.9) [25] and were lower than the mean age of the subjects in the study by Marck et al. (5.45±5.07) [45]. The mean age scores of the spouses of these individuals in the intervention and control groups were obtained as 32.9±38.28 and 57.8±36.50, respectively. These values were reported as 54.9±43.95 in the study by Afshar et al.; therefore, the spouses of participants in the present study were younger [46]. The mean scores of marriage duration in the intervention and control groups were 24.8±13.50 and 58.7±13.06, which are less than the mean marriage duration of participants in the study by Merghati Khoei et al. (56.9±5.25) [25].

It is worth noting that the majority of subjects in our study were women who were in their youth and early adulthood, and therefore, helping to improve their sexual performance and satisfaction could have an effect on increasing their quality of life and maintaining their marital satisfaction. In terms of clinical characteristics of diabetes, the mean disability severity scores of these individuals in the intervention and control groups were 1.44±3.00 and 1.41±3.11, respectively. As a result, most of the participants in this study did not have significant physical limitations due to diabetes. Therefore, considering that all participants had sexual dysfunction at the time of entering the study, it can be concluded that women with diabetes who do not have significant physical limitations and disability should not be considered normal in terms of sexual function, and attention to the sexual health of people with diabetes at any level of disability and fatigue should be strictly considered.

Most subjects in the experimental group were housewives, while in the control group, they were housewives and freelancers. Regarding the education level, participants in the intervention group were illiterate or had elementary school education (17%), junior high school education (22%), senior high school education and diploma (28%), and academic education (34%). In the control group, the number of people with high school education and diploma and illiterate and elementary school students was equal (23%); moreover, they were equal in junior high school and university groups (28%). Among the spouses in both groups, the lowest education was related to academic education. The spouses of most participants were in six groups: unemployed, worker, employee, freelancer, repurchased, and retired. In both groups, the unemployed and retired people were equal (6(%, and the highest percentage pertained to freelancers reported as 38% and 34% in the intervention and control groups, respectively.

About 39% of participants in the intervention group had a relatively sufficient level of living expenses (average level according to the classification of tables in Chapter 4), and about 34% had sufficient income, and finally, the adequacy of the family's insufficient income was about 28%; nonetheless, in the control group, all three groups had equal values (34%). The duration of marriage was between 3 and 26 years, with only 2 people in the intervention group having lived together for 25 and 26 years, and in the control group for 25 years. The number of pregnancies ranged from no pregnancy experience to six pregnancy experiences. Among the study subjects in the intervention group, five, four, three, two, and one subjects had no, one, three and four, three, and six pregnancies, respectively. In the control group, the greatest number of pregnancies was once, and after that, they experienced pregnancy twice, and only one person experienced pregnancy for the fourth time. About 45% of the participants in both groups did not have children, or their pregnancies did not lead to the birth of a child. The most common choice of contraception among the participants in both groups was the withdrawal method, then condoms, and this issue leads to an undesirable marital outcome (unsatisfactory marital satisfaction).

There are about seven common diseases associated with type 1 diabetes, including heart disease and stroke, eye complications, kidney problems, skin problems, weight-related problems, as well as stomach and intestinal problems. Most study

subjects in the intervention group had three diseases along with diabetes, and in the control group, most study subjects were suffering from two or three diseases, which have a direct impact on sexual performance and satisfaction. According to the results of the study by Zamani et al. [47], chronic diseases have a direct impact on sexual performance and satisfaction. The results of the present study pointed out that the mean mental health index of women in the study was 52.78±3.80. The mean scores of depression in the intervention and control groups were 1.68±14.83 and 2.29±15.11, respectively. The mean severity of anxiety scores in the intervention and control groups was 2.08±19.72 and 2.97±20.83, respectively. The mean scores of severity of stress in the intervention and control groups were 2.12±17.44 and 1.65±17.61, respectively. Considering that sexual performance and satisfaction were examined in this study, and one of the factors affecting sexual health and marital satisfaction and happiness is balanced mental health, according to the results, it can be stated that one of the reasons for sexual disorders was low mental health in these individuals.

The results of this research regarding the direct effect of anxiety, depression, and stress on sexual function and marital satisfaction are consistent with the studies by Foley et al. [48], Woollett and Edelmann [49], Bronner et al. [50], Marck et al. [45], Yılmaz et al. [51], Gedizlioglu et al. [52], and Prunty et al. [53]. Nonetheless, they differ in the fact that this research was conducted only on female patients with diabetes, but the stated studies were performed on women and men with chronic diseases. In fact, patients with chronic diseases suffer from depression due to the nature and duration of the disease, as well as the lack of necessary environmental support, which causes isolation in individuals. In addition, the unpredictability of the disease causes anxiety, stress, fear, and dependence; moreover, when caregivers cannot respond to the patient's needs, the cycle of depression and anxiety continues.

Conclusion

As evidenced by the findings of this study, the couple counseling model based on the BETTER model proved to be successful in notably enhancing the sexual function of diabetic women. Given the low quality of life of these individuals, it is recommended that this training be used in diabetes support groups. Furthermore, in addition to the interventions employed in the present study, psychosocial and multidisciplinary interventions should be given more attention in a larger sample size.

Compliance with Ethical Guidelines

The study participants first read the written informed consent form and completed it if they were willing to participate in the study. In addition, the study protocol was approved by the Research Ethics Committee.

Ethical Considerations

This research was extracted from a doctoral thesis in health psychology and a national project at the Women's Sexual Health Research Center, which has been registered with the ethics ID IR.IAU.NAJAFABAD.REC.1398.075. We would like to thank all the patients who did not give up in the face of their disease.

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Authors' Contributions

All the authors participated in the initial writing of the article and its revision, and all accepted the responsibility of accuracy.

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Conflicts of Interest

The authors declare that they have no conflict of interest.

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