



# The Correlation Between Sexual Dysfunction and Marital Dissatisfaction in Women With Type 2 Diabetes Mellitus: A Cross-sectional Study

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## Abstract

**Objectives:** The prevalence of sexual dysfunction and marital dissatisfaction is higher in women with type 2 diabetes mellitus than in the general population. However, the correlation between sexual dysfunction and marital dissatisfaction in diabetic women is debated. The present study investigated the correlation between sexual dysfunction and sexual dissatisfaction in diabetic women.

**Materials and Methods:** In this cross-sectional study, 126 women with type 2 diabetes mellitus, referring to Sanandaj Diabetes Center, Sanandaj, Iran, were compared to 126 randomly selected non-diabetic women referring to Health Centers of Sanandaj, Iran. Women's sexual function was appraised through the female sexual function index (FSFI), and their marital satisfaction was compared using ENRICH (Evaluation and Nurturing Relationship Issues, Communication and Happiness) Marital Satisfaction Scale.

**Results:** There was a positive significant relationship between sexual function and marital satisfaction ( $P < 0.01$ ,  $r = 0.675$ ) in diabetic women. In other words, marital satisfaction improved sexual function increases.

**Conclusions:** Marital satisfaction in diabetic women with sexual dysfunction is more unfavorable than in healthy women. Therefore, maximum attention should be paid to the role of sexual dysfunction in the marital relationship of people with diabetes mellitus.

**Keywords:** Sexual dysfunction, Sexual satisfaction, Diabetes mellitus, Type 2

## Introduction

Diabetes prevalence is rapidly increasing worldwide; it is estimated that 550 million people will have suffered from diabetes by 2030 (1). Type 2 diabetes mellitus constitutes 90-95% of all detected cases of diabetes mellitus (2). More than 4.6 million Iranians have diabetes mellitus, which triples every 15 years (3). According to the statistics provided by the Iranian Diabetes Association, the prevalence of type 2 diabetes mellitus is two times higher in women than men, and it increases with higher obesity (4). Diabetes mellitus is the cause of physical and mental disorders (3).

Scientists believe that diabetes and insulin resistance are the leading cause of anovulation, infertility, and early abortion in infertile women with type 2 diabetes mellitus. Studies showed that diabetes mellitus is one of the causes of oligomenorrhea (5). In a study in Iran, 60.4% of non-diabetic women had moderate to low sexual satisfaction (6). This disorder is higher, with up to 80% prevalence in diabetic women (7). Sexual dysfunction in diabetic women is more prevalent than in the general population, correlated with diminished quality of life (8). There is a large body of research on sexual dysfunction in diabetic men, but women's sexual dysfunction has received less attention (8, 9). Diabetic people have arousal disorders three times higher than the general population (9).

Reduced sexual desire is highly prevalent in diabetic women (10) and is reported to be up to 70% in diabetic women (11).

Diabetic women who experience less conflict in the family tend to better cope with their condition and receive better treatments (12). Marital dissatisfaction and sexual dysfunction, a chronic complexity of diabetes mellitus, are often overlooked in diabetic women (13).

Following searches in google scholar and PubMed databases, a few papers were found about sexual function and marital satisfaction in diabetic women. However, the correlation between sexual dysfunction and marital dissatisfaction in diabetic women is open to debate (13). This study aimed to investigate the correlation between sexual dysfunction and sexual dissatisfaction in diabetic women.

## Materials and Methods

This cross-sectional study evaluated the sexual function of 30-50-year-old women with type 2 diabetes mellitus referring to Sanandaj Diabetes Center, Sanandaj, Iran, compared to non-diabetic women referring to health Health Centers Sanandaj, Iran. Inclusion criteria were no history of surgical operation over the last three months, no genital sores or lumps, living with current husband in the previous six months, monogamous husband, and no



## Key Messages

- ▶ Sexual function and marital satisfaction in women with type 2 diabetes mellitus are lower than in healthy women, and there is a significant relationship between sexual satisfaction and marital process.

mental illness (depression) as claimed by the participants. Women in the non-diabetic group were selected from the married women aged 30-50 years referred to five health centers in Sanandaj, Iran, which were chosen randomly among the 15 health centers using the “Random.org” website (<https://www.random.org/>). Each center’s sample size was calculated proportionate to the primary sample size ( $n=254$ ) based on the number of married women aged 30-50 years covered by the center. If women’s fasting blood sugar was  $<126$ , she was included in the non-diabetic group. Women with type 2 diabetes mellitus were also selected randomly from women’s files in the Sanandaj Diabetes Center using a random numbers table. The researcher made phone calls to the women and explained the research goals and procedure. If interested, they would be asked to refer to their health centers on a particular date to fill out the questionnaires. On their visit, they got evaluated in terms of essential information and inclusion and exclusion criteria. Qualified women would be given comprehensive information about the reasons for doing the research, benefits, procedures, results, and anonymity of data, and those willing to participate filled out written consent forms. If the sample size requirement was not fulfilled at this stage because of not meeting inclusion criteria, unavailability, or unwillingness to participate, the first stage, namely, a random selection of women, would be repeated until the required number of samples was reached. Participants were first asked to complete a form designed by researchers to collect women’s demographic information. The researcher would fill out the questionnaires for illiterate or low-literate women.

Data collection instruments were the female sexual function index (FSFI) and ENRICH (Evaluation and Nurturing Relationship Issues, Communication and Happiness) scale. Rosen and co-workers developed FSFI to assess female sexual function (14). Mohammadi and colleagues (2008) confirmed its validity and reliability (Cronbach’s  $\alpha \geq 70\%$ ) for the Iranian context (14). It has 19 items and measures sexual function in six domains, including desire (2 items), arousal (4 items), lubrication (4 items), orgasm (3 items), satisfaction (3 items), and pain (3 items) over the last 4 weeks. These are scored from 0.1 to 5, and higher scores indicate more favorable sexual function.

ENRICH scale is a 115-item instrument developed by Fowers and Olson (15). It is generally used to assess potential conflicts or identify the strengths of marital relationships. It is also used to identify couples who need counseling and strengthen their relationship (16).

All the instruments were validated using content and face validity. Additionally, by doing a test-retest with 20 subjects, the reliability of the devices was verified in terms of intraclass correlation (ICC) and internal consistency (Cronbach’s alpha coefficient). Cronbach’s alpha was 0.89 for sexual function, 0.96 for marital satisfaction, and 0.92 for quality-of-life questionnaires. Since alpha was higher than 0.7 in the three questionnaires, their reliability was confirmed.

### Statistical Analysis

The statistical analysis was performed using the Statistical Package for the Social Sciences software (SPSS, version 16.0 for Windows; SPSS Inc., Chicago, IL). Data were analyzed using the normality Kolmogorov–Smirnov test. The quantitative variables were analyzed using the independent t-test, and qualitative variables were analyzed using chi-square or Fisher’s exact test.  $P < 0.05$  was considered as significant.

### Results

The mean age of women was 46.74 and 40.85 years in the diabetic and healthy groups, respectively. Diabetic women had more than five pregnancy experiences (66.9%). There was a significant difference between the two groups regarding the number of pregnancies. In the healthy group, most women used natural methods for contraception (40.5%), while most women in the diabetic group used tubal ligation (47%) ( $P=0.042$ ). The results showed that sexual function was statistically different between the two groups ( $28.83 \pm 12.1$  versus  $29.89 \pm 9.8$ , respectively;  $P=0.044$ ). Sexual function and its subdomains were compared between two groups. There were significant differences among the two groups regarding desire, lubrication, orgasm, satisfaction, and pain. But the difference between the two groups was not significant in terms of arousals (Table 1). The results show that marital satisfaction score was statistically different between the two groups ( $114.5 \pm 36.40$  versus  $108.51 \pm 34.87$ , respectively;  $P=0.000$ ). The results showed no important relationship between sexual function and marital satisfaction of healthy women ( $P < 0.01$ ,  $r = 0.28$ ). There was a positive (direct) significant relationship between sexual function and marital satisfaction ( $P < 0.01$ ,  $r = 0.675$ ) in diabetic women. In other words, marital satisfaction improved with increased sexual function (Table 2).

Investigating the relationship between sexual function and demographic characteristics in healthy women showed a significant positive relationship between women’s age, husband’s age, number of pregnancies, and number of children. There was also a significant negative relationship between the ages of marriage. In women with diabetes mellitus, there was a significant negative relationship between their age and their husband’s age, and there was a meaningful positive relationship between the periods of marriage. Investigating the relationship between

marital satisfaction and demographic characteristics in two groups showed a significant negative relationship between women's age, husband's age, and the number of children. Also, in women with diabetes mellitus, there was a significant positive relationship between the ages of marriage and marital satisfaction (Table 3).

## Discussion

The present study results showed that the prevalence of sexual dysfunction and marital dissatisfaction in women with type 2 diabetes mellitus was higher than in healthy women. There was a significant positive relationship between sexual function and marital satisfaction in diabetic women.

Fatemi and co-workers conducted a study and evaluated the sexual function in women with type 2 diabetes mellitus. Their results showed that the sexual function score in sexual desire, stimulation, vaginal wetting, orgasm, and

overall sexual satisfaction in the diabetic group was lower than in the control group (17).

Parnan and colleagues showed a significant difference between diabetic and non-diabetic women in terms of the total score of sexual function of 180 women referred to health facilities in Mashhad, Iran (18). Also, the results of some studies showed that the mean sexual score performance in people with diabetes mellitus was lower than in the control group (19-21).

In the study in Feisal Abad and others, Pakistan, which was done on 100 women, their score for marital satisfaction was  $49.7 \pm 10.5$  (22). Trudel and Goldfarb concluded that sexual function and marital satisfaction were highly correlated (23). The studies mentioned above are in line with the present study's findings. Unlike our results, Alikamali et al showed a non-significant difference in sexual desire between healthy and diabetic women. The causes of this difference probably relate to the sample size and methodology of both studies (24).

A systematic study showed that diabetes mellitus, by damaging different organs, causes disorders in sexual response and reduces the quality of life in affected women (25). Khazaei and co-workers found a significant relationship between sexual dysfunction and low marital satisfaction in Iranian married students (26), which differed from the present study's findings in the control group. The causes of this difference probably relate to the age and education of participants.

Another study on diabetic women showed that successful treatment of low sexual desire was related to significant improvement in marital satisfaction (13). It has been reported that improving 'couples' sexual relationships leads to an improved marital relationship (27).

This study investigates the positive relationship between sexual function and healthy women's age, their husband's age, the number of pregnancies, and the number of children. There is also a significant negative relationship between marriage ages and sexual function. In women with diabetes mellitus, there was a significant negative relationship between their age and their husband's age. Also, there was a meaningful positive relationship between the periods of marriage and sexual function.

The present paper's results of investigating the

**Table 1.** Sexual Function and its Subdomains in Women With and Without Type 2 Diabetes Mellitus

Subdomains	Healthy Women (n = 127)	Diabetic Women (n = 127)	P Value <sup>a</sup>
Desire	3.40 ± 1.5	4.52 ± 1.1	0.000
Arousal	5.17 ± 3.1	5.35 ± 3.8	0.672
Lubrication	6.82 ± 2.7	5.6 ± 3.6	0.003
Orgasm	4.95 ± 2.1	4.29 ± 2.7	0.036
Satisfaction	2.50 ± 2.1	4.20 ± 1.8	0.000
Pain	7.03 ± 2.9	4.81 ± 4.3	0.000
Sexual function (total)	29.98 ± 9.8	28.83 ± 12.1	0.044

Data are expressed as mean ± SD.

<sup>a</sup> Independent t test.

**Table 2.** Correlation between Sexual Function and Marital Satisfaction in Diabetic and Healthy Women

	Marital Satisfaction	
	Healthy Women	Diabetic Women
Sexual function		
Pearson's coefficient	-0.007	0.568 <sup>a</sup>
Level of significance	0.938	0.000
Number	127	127

<sup>a</sup> Significant correlation at 0.01.

**Table 3.** Investigating the Relationship between Demographic Features with Sexual Function and Marital Satisfaction

	Sexual Function				Marital Satisfaction			
	Healthy Women		Diabetic Women		Healthy Women		Diabetic Women	
	Coefficient	P Value <sup>a</sup>	Coefficient	P Value <sup>a</sup>	Coefficient	P Value <sup>a</sup>	Coefficient	P Value <sup>a</sup>
Her age	0.25	0.005	-0.24	0.006	-0.25	0.005	-0.34	0.000
Husband's age	0.29	0.001	-0.26	0.003	-0.21	0.021	-0.30	0.001
Age of marriage	-0.24	0.007	0.23	0.01	0.14	0.105	0.19	0.029
Age of first pregnancy	-0.11	0.252	0.13	0.14	0.00	0.98	-0.02	0.848
Number of children	0.40	0.000	0.07	0.411	-0.15	0.099	-0.18	0.046
Number of pregnancies	0.37	0.000	-0.01	0.921	-0.22	0.012	-0.09	0.339

<sup>a</sup> Pearson correlation coefficient.

relationship between marital satisfaction and demographic characteristics showed that in healthy women and women with diabetes mellitus, there was a significant negative relationship between their age, their husband's age, and the number of children. In women with diabetes mellitus, there was a meaningful positive relationship between marital satisfaction and age of marriage.

The results of the study entitled "correlation between marital satisfaction and sexual dysfunction in women with type 2 diabetes" showed that sexual function had a significant relationship with the age of the control group (28), which was consistent with the findings of the present study. Still, the age of women with type 2 diabetes significantly did not affect the sexual dysfunction, which differed from the current paper's findings.

Another study stated a negative relationship between the age of diabetes mellitus and all stages of sexual function (29). The studies showed that different factors affect marital satisfaction, including effective communication methods for solving marital conflicts, mutual respect, premarital relationship, consistency, live time together, the number of children in the family, and the combination of the above factors. For example, the age of marriage is one of the critical factors that, based on being high or low experiences, can significantly affect marital satisfaction (30). In our study, duration of marriage and aging were other factors that probably affected this satisfaction.

#### Limitations of the Study

- Since the statistical population included 30-50-year-old females with and without type 2 diabetes mellitus referred to Sanandaj health centers, the results were therefore generalizable to the population mentioned above.
- Data collection instruments were questionnaires that were administered on a self-report basis.
- Complete sample matching was not possible because of the large sample size.

#### Conclusions

A correlational (not causal) link was found in the present study between sexual dysfunction and marital dissatisfaction, but it cannot be determined which variable is the cause and effect. Since the present article points out the correlation between marital satisfaction and sexual dysfunction in women with diabetes mellitus, there is hope that treatment of sexual dysfunction in this group of the population could improve their marital satisfaction. According to the present findings and given the family's unique role in providing a favorable environment and the increased possibility of controlling diabetes mellitus due to improved interpersonal relationships among couples, it is necessary to focus on the correlation between marital satisfaction and sexual function.

It is suggested that healthcare staff, from endocrinologists, family practitioners, nurses, and midwives, who work with

diabetic women, should pay more attention to promoting marital satisfaction among these women

#### Authors' Contribution

SG, MK, and NSJ conceived and designed the study. JB prepared the data analysis. FU conducted the study. MK and NSJ critically revised the manuscript. All authors have read and approved the final manuscript and take responsibility for the integrity of the data.

#### Conflict of Interests

The authors declare that they have no competing interests.

#### Ethical Issues

The study proposal was approved by the Ethics Committee of Tabriz University of Medical Sciences, Tabriz, Iran (Code: TBZMED.REC.1394.1133). All participants were informed about the study's aims and procedures and signed the written consent before participating in the study.

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#### References

1. Maiorino MI, Bellastella G, Esposito K. Diabetes and sexual dysfunction: current perspectives. *Diabetes Metab Syndr Obes.* 2014;7:95-105. doi:10.2147/dms.o.s36455
2. Gibbons CH. Diabetes and metabolic disorders and the peripheral nervous system. *Continuum (Minneapolis).* 2020;26(5):1161-1183. doi:10.1212/con.0000000000000906
3. Makhdoomi Arzati M, Mohammadzadeh Honarvar N, Saedisomeolia A, et al. The effects of ginger on fasting blood sugar, hemoglobin A1c, and lipid profiles in patients with type 2 diabetes. *Int J Endocrinol Metab.* 2017;15(4):e57927. doi:10.5812/ijem.57927
4. Zhu Y, Fish AF, Li F, Liu L, Lou Q. Psychosocial factors not metabolic control impact the quality of life among patients with type 2 diabetes in China. *Acta Diabetol.* 2016;53(4):535-541. doi:10.1007/s00592-015-0832-y
5. Zamani N, Rezaee Jamaloe H, Behboodi Moghadam Z, Moshki M, Peikari HR. On the health concerns of women with diabetes: combined study. *J Diabetes Nurs.* 2019;7(3):857-876. [Persian].
6. Bahrami N, Soleimani MA, Shraifnia SH, Masoodi R, Shaigan H, Mohammad Rezaei ZH. Female sexual satisfaction with different contraceptive methods. *Iran Journal of Nursing.* 2012;25(76):55-63. [Persian].
7. Ayuk AE, Omoronyia OE, Asibong UE, Enang OE, Legogie AO, Nwafor KN. Impact of diabetes mellitus on sexuality in a developing country setting: a case-control study in Calabar, Nigeria. *Niger J Clin Pract.* 2020;23(6):870-878. doi:10.4103/njcp.njcp\_5\_20
8. Haider KS, Haider A, Doros G, Traish A. Long-term testosterone therapy improves urinary and sexual function, and quality of life in men with hypogonadism: results from a propensity matched subgroup of a controlled registry study. *J Urol.* 2018;199(1):257-265. doi:10.1016/j.juro.2017.07.039
9. Shindel AW, Lue TF. Sexual dysfunction in diabetes mellitus. In: *Endotext.* South Dartmouth, MA: MDText.com, Inc; 2000.
10. Younis I, Alkady OH, Emam RM. Sweet blood with bitter consequences: sexual dysfunction in diabetic women. *Hum Androl.* 2019;9(2):55-63. doi:10.21608/ha.2019.19127.1051



11. McCabe MP, Sharlip ID, Lewis R, et al. Risk factors for sexual dysfunction among women and men: a consensus statement from the Fourth International Consultation on Sexual Medicine 2015. *J Sex Med.* 2016;13(2):153-167. doi:10.1016/j.jsxm.2015.12.015
12. Young-Hyman D, de Groot M, Hill-Briggs F, Gonzalez JS, Hood K, Peyrot M. Psychosocial care for people with diabetes: a position statement of the American Diabetes Association. *Diabetes Care.* 2016;39(12):2126-2140. doi:10.2337/dc16-2053
13. Haddadi S, Ghodrati Mirkohi M, Akbari-Kamrani M. The relationship between self-efficacy and sexual function in women with type II diabetes mellitus. *Bali Med J.* 2016;5(3):11-16. doi:10.15562/bmj.v5i1.271
14. Arab Alidousti A, Nakhaee N, Khanjani N. Reliability and validity of the Persian versions of the ENRICH marital satisfaction (brief version) and Kansas Marital Satisfaction Scales. *Health Deve J.* 2015;4(2):158-167.
15. Fowers BJ, Olson DH. ENRICH Marital Satisfaction Scale: A brief research and clinical tool. *J Fam Psychol.* 1993;7(2):176-185. doi:10.1037/0893-3200.7.2.176
16. Bakhshayesh AR, Mortazavi M. The relationship between sexual satisfaction, general health and marital satisfaction in couples. *J Appl Psychol.* 2010;3(4):73-85.
17. Fatemi SS, Taghavi SM. Evaluation of sexual function in women with type 2 diabetes mellitus. *Diab Vasc Dis Res.* 2009;6(1):38-39. doi:10.3132/dvdr.2009.07
18. Parnan A, Tafazolim M, Azmoude E. Comparison of the sexual function among women with and without diabetes. *J Midwifery Reprod Health.* 2017;5(4):1090-1097. doi:10.22038/jmrh.2017.9052
19. Elyasi F, Kashi Z, Tasfieh B, Bahar A, Khademloo M. Sexual dysfunction in women with type 2 diabetes mellitus. *Iran J Med Sci.* 2015;40(3):206-213.
20. Hassanin IM, Helmy YA, Fathalla MM, Shahin AY. Prevalence and characteristics of female sexual dysfunction in a sample of women from Upper Egypt. *Int J Gynaecol Obstet.* 2010;108(3):219-223. doi:10.1016/j.ijgo.2009.09.031
21. Erol B, Tefekli A, Sanli O, et al. Does sexual dysfunction correlate with deterioration of somatic sensory system in diabetic women? *Int J Impot Res.* 2003;15(3):198-202. doi:10.1038/sj.ijir.3900998
22. Maryam R, Mahmood K. Gender differences on marital satisfaction and social relations among diabetic patients. *Int J Sci Eng Res.* 2014;5(1):45-51.
23. Trudel G, Goldfarb MR. Marital and sexual functioning and dysfunctioning, depression and anxiety. *Sexologies.* 2010;19(3):137-142. doi:10.1016/j.sexol.2009.12.009
24. Alikamali M, Khodabandeh S, Motesaddi M. Sexual dysfunction in males and females with type 2 diabetes referring to healthcare centers of Zarand, Kerman: a cross-sectional study. *Shiraz E Med J.* 2019;20(8):e84268. doi:10.5812/semj.84268
25. Karimi-Valoujae S, Hasani-Moghaddam S, Kashi Z, Yousefi SS, Sharifnia Sh, Khani S. Effective factors on sexual dysfunction in women with diabetes: a systematic review. *Clin Exc.* 2020;10(1):71-85. [Persian].
26. Khazaei M, Rostami R, Zaryabi A. The relationship between sexual dysfunctions and marital satisfaction in Iranian married students. *Procedia Soc Behav Sci.* 2011;30:783-785. doi:10.1016/j.sbspro.2011.10.152
27. Kaplan Serin E, Duman M, Yilmaz S. Sexual life quality and marital adjustment in women with and without diabetes. *Sex Disabil.* 2020;38(4):625-635. doi:10.1007/s11195-020-09663-y
28. Najafi M, Mirhoseini M, Moghani Lankarani M, Assari S. Correlation between sexual dysfunction and marital dissatisfaction among diabetics. *Iran J Endocrinol Metab.* 2006;8(2):175-179. [Persian].
29. Taghavi M, Fatemi F, Abutorabi R. Sexual function in women with diabetes. *Iranian Journal of Diabetes and Lipid Disorders.* 2009;8(4):357-362. [Persian].
30. Rahimi M, Reshadat S, Farid Marandi B, Zakiei A. Factors associated with sexual function and sexual satisfaction in male patients with diabetes type 2. *J Mazandaran Univ Med Sci.* 2018;28(164):164-169. [Persian].

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