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Sexual Dysfunction and Sexual Quality of Life in Women with Diabetes: The Study Based on a Diabetic Center

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Abstract This study was conducted on a cross-sectional basis for the purpose of determining the prevalence of sexual dysfunction (SD) and sexual quality of life in women with diabetes and, showing the correlation of them with some variables associated with diabetes. The study recruited 423 women with diabetes, through a diabetic center for control from January to December 2012. The data was collected with Socio-demographic and Disease Associated Properties Form, Women Sexual Function Index (FSFI) and Sexual Quality of Life Questionnaire-Women (SQLQ). The mean age of the women, who participated in the study, was 50.0 (SD = 11.3) and, their mean marital period was 30.0 (SD = 11.8). 83 % of the women had type 2 and, 17 % of them had type 1 diabetes and, their mean duration of disease is 11.4 (SD = 7.2). 60.5 % of the women expressed that their sexual desire decreased and, 61.7 % of them expressed that their frequency of sexual intercourse reduced after the diagnosis of their disease. According to the total FSFI scores, 80.4 % of the women had SD. The frequency of SD in women with type 2 diabetes (85.6 %) was significantly higher than that in women with type 1 diabetes (%55.6) ($p < 0.001$). The sexual quality of life of women with SD (62.7 ± 21.2) was significantly lower than that of those without SD (89.6 ± 9.9) ($p < 0.001$). According to these study results, SD was prevalent in women with diabetes, particularly those with type 2 diabetes and also their sexual quality of life was low in parallel with this.

Keywords Diabetes · Sexual dysfunction · Quality of sexual life · Turkey · Women

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Introduction

Sexuality not only reflects the reproductive organs of an individual, but all of his/her properties as a human as well and, involves an individual's biological structure, learning experiences, attitudes, values and behaviors. The problems encountered by a women in relation with her sexual life are influenced by her living conditions and, on the other hand any change in sexual health affects an individual's life and general health [1, 2]. Sexual dysfunction in women is an important problem encountered with a very high percentage and, affects the whole life of a women [3–5]. According to Sexual Dysfunction Association, the percentage of sexual dysfunction in women increases with the age and generally affects one half of the women [6].

Diabetes Mellitus is one of the important reasons for sexual dysfunction and it is seen twice more than normal population [4, 6, 7]. Different types of diabetes have different effects on biological mechanisms that mediate sexual response or on psychosocial factors, both of which impact broader cognitive and psychological aspects of sexuality [8–10]. The percentage of sexual dysfunction in women with diabetes is found to be 26.4 % by Rawa et al. [11] and, the percentage of sexual dysfunction in women with type 2 diabetes is found to be 49 % by Taloyan et al. [12]. In the study conducted by Doruk et al. [13] in Turkey, the percentage of sexual dysfunction is found to be 71 % in women with type 2 diabetes, 42 % in women with type 2 diabetes and 37 % in the control group. On the other hand, it draws attention that the sexual functions of women are less frequently studied [10, 14, 15]. However, considering the nature of diabetes and the effects of the therapies administered to women, it can be thought that diabetes can multi dimensionally affect an individual's sexuality beyond sexual function by affecting many areas such as physical image, self-respect, roles and responsibilities and communication with partner. One of these dimensions is sexual quality of life.

The effect of diabetes on sexuality is often determined by considering sexual function. However, when sexuality is considered as a multi dimensional concept, the consideration of the sexual quality of life as a concept expressing an individual's satisfaction with his/her sexual life in addition to sexual function will provide more comprehensive information on the sexuality of diabetic individuals. Studies on the sexual quality of life of women with diabetes and associated factors are also very limited. Therefore, this study is conducted for the purpose of determining the prevalence of SD and the sexual quality of life in women with diabetes and showing the correlation of these with some variables associated with diabetes.

Materials and Methods

The study recruited 423 women with diabetes, through a diabetic center for control from January to December 2012. The study included those women, who agreed to participate in the study, were over the age of 18, had no problems with reading, understanding and answering questions, were married and diabetic. An approval was obtained from the ethical committee of the institution to conduct the study (Approval No: 2011/1992-860).

Data Collecting Tools

The data was collected with Socio-demographic and Disease Associated Properties Form, Women Sexual Function Index (FSFI) and Sexual Quality of Life Questionnaire-Women-SQLQ-F.

Socio-demographic and Disease Associated Properties Form

The form drawn up according to the literature consists of two parts. The first part of the form includes questions about socio-demographical properties and, the second part included questions about diabetes including type of diabetes, duration of diabetes, diabetic treatment form and HbA1c level.

The Women Sexual Function Index–FSFI

It is developed by Rosen et al. [16] for the purpose of evaluating women sexual functions. The index comprises six sub-dimensions: desire, arousal, lubrication, orgasm, satisfaction and pain and, 19 items in total. Sexual problems or functions within the last week can be evaluated using the index. In the index, the questions 3–14 and 15–19 have 6 (0–5 points) likert type point scale, while the other questions have 5 (1–5 points) likert type point scale. The index applicable to those, who had sexual intercourse within the last month, is scored negatively; the index score is obtained by multiplying the scores obtained from sub-dimensions by the factor loads. The index delivers a maximum score of 36.0 and a minimum score of 2.0 and, a total FSFI score below 26.55 indicates SD [17]. Aygin and Aslan [17] conducted a reliability and validation study on the index for our country in 2005.

Sexual Quality of Life Questionnaire-Women-SQLQ-F

It is developed by Symonds et al. [18] and adapted into Turkish by Tugut and Golbası [19]. The index consists of 18 items scored with 1–6 points and, the total score obtained is translated into 100 points. Each item is scored with 1–6 (1 = completely agree, 2 = substantially agree, 3 = partially agree, 4 = partially disagree, 5 = substantially disagree, 6 = completely disagree). The index has no cutoff score and a high total score obtained from the index indicates that a sexual quality of life is good.

Statistical Analysis

The data was evaluated on SPSS 14.0 software and Chi square, significance test between the two means and correlation analysis were used in the statistical analysis.

Results

The mean age of the women included in the study was 49.99 (SD = 10.29) and, their mean marital period was 29.99 (SD = 11.79). 83 % of the women had type 2 and 17 % of them had type 1 diabetes and, their mean duration of disease was 11.36 (SD = 7.16) years. While 36.9 % of the women used oral antidiabetics as therapy, 35 % of them used insulin in addition to oral antidiabetics. 60.5 % of the women expressed a decrease in their sexual desire and 61.7 % of them expressed a reduction in their frequency of sexual intercourse after the diagnosis of the disease.

Table 1 shows FSFI sub dimension, total FSFI and total SQLQ-F scores of the women. It draws attention in the table that the women' total FSFI mean score was 15.83 (SD = 10.50) and, their total SQLQ-F mean score was 68.01 (SD = 22.22). In the correlation analysis conducted, it was determined that there was a positive significant

correlation between the total FSFI and all sub dimension average scores and the SQLQ-F average score ($p < 0.05$).

As seen in the Fig. 1, 80.4 % of the women suffer from SD according to the total FSFI score.

Table 2 shows the existence of SD according to the personal properties of the women. According to the table, the frequency of experiencing SD was significantly high in women, who were at the age of 50 or older, together with their spouses had an educational level of primary school and lower, were unemployed, had married by prearranged marriage, had children and were in menopause ($p < 0.05$).

Table 3 shows the distribution of experience of SD in women according to some properties associated with diabetes. According to this, the frequency of SD in women with type 2 diabetes (85.6 %) was significantly higher than that in women with type 1 diabetes (55.6 %) ($p < 0.001$). When the existence of SD in women according to their diabetic treatment was examined, the frequency of SD in women, who only received insulin treatment (72.7 %), was found to be lower than that in women, who received oral antidiabetics (84.6 %) and insulin treatment in addition to oral antidiabetics (82.4 %) ($p < 0.05$). On the other hand, it is determined that there was no significant difference between the frequency of SD in women according to the duration of diabetes and HbA1c level ($p > 0.05$).

Discussion

In the present study, both SD and sexual quality of life were measured in women with diabetes. In the study, it is found that 80.4 % of the women with diabetes had SD, the sexual quality of life score of women with SD was significantly lower than that of the women without SD and, there was a positive significant correlation between the total FSFI and all sub dimension average scores and the SQLQ-F average score. Therefore, it can be stated that the percentage of SD was significantly high in women with diabetes (8.4 out of 10) and, the sexual quality of life of these women were low. It can be considered that this is important and preferential for understanding and helping with the situation affecting the women with diabetes. In many studies conducted, it is shown that sexual problems in women with diabetes range from 18 to 80 % [20–33]. In this study, it is determined that sexual dysfunction prevalence (defined as IFSF score $\leq$30) was higher than the percentages indicated in the studies. One reason for this can be the view of sexuality of women in Turkish society, their tendency to hide problems and their behaviors such as embarrassment. Sexuality is a taboo and, it can be neither expressed nor spoken about. It is also known that one of the biggest reasons for divorces is a sexual problem. It makes it easier to understand the situation when a women has a chronic disease like diabetes in addition to the general social view. On the other hand, the reason for the high frequency of sexual dysfunction in women with diabetes can result from neurogenic, psychogenic or vascular factors or a combination of them. In addition, age, duration of diabetes, menopause, microvascular complications, psychological and cultural factors are also among risk factors [34–38].

In this study, the frequency of SD in women with type 2 diabetes (85.6 %) was significantly higher than that in women with type 1 diabetes (55.6 %) ($p < 0.001$). The higher frequency of SD and, the lower sexual quality of life in women with type 2 diabetes are considered to be resulting from the fact that women with type 2 diabetes were in the older age group and, most of them were in menopause. While the prevalence of SD in women

Table 1 Total FSFI/sub dimension and SQLQ-F score average of the womens

FSFI sub dimensions	Average (SD)
Desire	2.57 (1.21)
Arousal	2.19 (1.79)
Lubrication	2.71 (2.14)
Orgasm	2.35 (1.97)
Satisfaction	2.74 (1.71)
Pain	3.25 (2.52)
Total FSFI score	15.83 (10.50
SQLQ-F	68.01 (22.22)

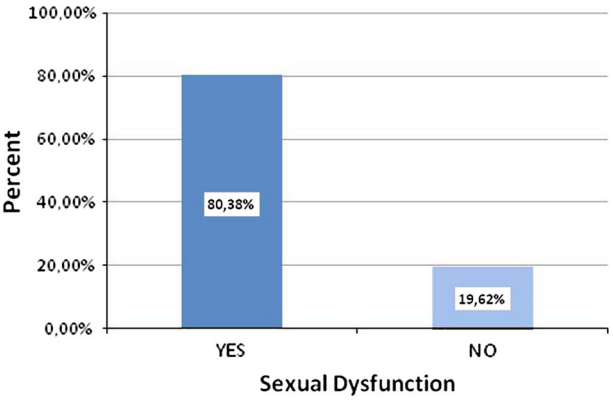

Fig. 1 Prevalence of sexual dysfunction in diabetic womens

increases with age [34, 35, 39–41], the decrease in serum estrogen level with menopause affects sexual response. The decrease in estrogen level causes vaginal atrophy resulting in vaginal dryness and pain [42]. Upon the transition to menopause adversely affecting sexuality, the prevalence of SD in women increases [34, 38, 43]. In a study conducted by Yánez et al. [35] on 385 healthy women with ages of 40–65, it is found that SD was seen 1.8 times more frequently in women with detected existence of menopause and, the prevalence of SD increased to 92.3 % at ages of 60–65 while it was 71.6 % at the ages of 40–44 [35]. On the other hand, the high frequency of SD in women with type 1 diabetes should also be considered. In the studies conducted on women with type 1 diabetes, it is reported that SD is found with different percentages such as 18 % [22], 27 % [14], 35.4 % [7], 51 % [44] and 71 % [13]. The reason for obtaining different results in the studies may arise from other properties apart from diabetes of the sample groups, conduction of studies in different socio-cultural environments and the differences of the measuring tools used for evaluating sexual function.

In this present study, 60.5 % of the women expressed that their sexual desire decreased, and 61.7 % of them expressed that their frequency of sexual intercourse reduced after the diagnosis of the disease. Many studies conducted show that diabetes causes a significant decrease from 20 to 80 % in the level of sexual desire of women [13, 14, 23, 25, 26, 29, 45, 46]. The level of decrease in the sexual desire in our study (60.5 %) was also compatible

Table 2 Existence of sexual dysfunction in womens according to their personal properties

Variables	Sexual dysfunction		x^2/p
	Yes FSFI < 26.55 Number (%)	No FSFI ≥ 26.55 Number (%)	
Age (year)			
49 and younger	101 (62.0)	62 (38.0)	57.02/0.001
50 and older	239 (91.9)	21 (8.1)	
Education level			
Primary and lower	243 (85.3)	42 (14.7)	13.21/0.001
High school and higher	97 (70.3)	41 (29.7)	
Employment status			
Employed	33 (60.0)	61 (16.6)	16.64/0.0001
Unemployed	307 (83.4)	22 (40.0)	
Education level of spouse			
Primary and lower	181 (86.2)	29 (13.8)	8.93/0.003
High school and higher	159 (74.6)	54 (25.4)	
Type of marriage			
Unarranged	131 (74.0)	46 (26.0)	7.82/0.005
Prearranged	209 (85.0)	37 (15.0)	
Parental status			
Parent	319 (82.9)	66 (17.1)	16.69/0.001
Non-parent	21 (55.3)	17 (44.7)	
Menopause status			
Yes	249 (92.2)	21 (7.8)	66.39/0.001
No	91 (59.5)	62 (40.5)	

with these results. But in the study conducted by Giraldi and Kristensen [10], it is shown that diabetes has no effect on sexual desire. This may be seen as contradictory result. It may be considered here that while lack of sexual desire can be associated with diabetes or it may also develop depending on various factors without association with diabetes.

In this study, it is found that SD is significantly seen more frequently in unemployed women. The reason may be a decrease in self-respect associated with the lack of individual income and, the decrease in the economic income of the family and associated emergence of change in intra-social statute and social life. Hence, it is found that employment status of women affects SD and the percentage of SD in those unemployed is higher in the study of Yanez et al. [35].

When the experience of SD according to the diabetic therapy type of women was examined, the frequency of SD in women, who only received insulin therapy (72.7 %) was found to be lower than that in women who received oral antidiabetic (84.6 %) and insulin therapy in addition to oral antidiabetics (82.4 %) ($p < 0.05$). This may be explained by the fact that insulin was required for ensuring blood glucose regulation in the cases, and the level of blood glucose regulation cannot be ensured with oral antidiabetic therapy. Because when sufficient level of blood glucose regulation was not ensured, cavernous relaxation spoilt due to accumulation of glicosylation products and glicolyzed hemoglobin;

Table 3 Existence of sexual dysfunction according to the disease properties of womens

Variables	Sexual dysfunction		x^2/p
	Yes FSFI < 26.55 Number (%)	No FSFI ≥ 26.55 Number (%)	
Type of diabetes			
Type 1	40 (55.6)	32 (44.4)	33.89/0.001
Type 2	300 (85.5)	51 (14.5)	
Treatment type of diabetes[a]			
Oral antidiabetics	132 (84.6)	24 (15.4)	6.30/0.043
Oral antidiabetics + insulin	122 (82.4)	26 (17.6)	
Insulin	80 (72.7)	30 (27.3)	
Duration of diabetes			
10 years and less	178 (79.5)	46 (20.5)	0.25/0.616
11 years and more	162 (81.4)	37 (18.6)	
HbA1c level			
Normal (<%6.5)	45 (78.9)	12 (21.1)	0.08/0.770
High (≥6.5)	295 (80.6)	71 (19.4)	

[a] Only 9 womens receiving diet therapy were excluded from the analysis

microangiopathy was formed, the basal membrane of blood vessel wall thickened and the nerve conduction which ensures vaginal smooth muscle relaxation spoilt. As a result, SD was formed [35].

In this study, it is found that there is no significant difference between frequency of experiencing SD in women according to the duration of diabetes and HbA1c level ($p > 0.05$). While in a study conducted by Erol et al. [23] on women with diabetes, it is found that there was no significant difference between Hba1c and SD, in other studies conducted, it is concluded that there was no significant difference between the duration of diabetes and HbA1c level as similar to our study [14, 27, 30, 33, 41, 47]. This can be explained by the fact that sexuality is not only affected by the disease but involves a wider range that affects the whole life of an individual.

Conclusion

SD was prevalent in women with diabetes and particularly those with type 2 diabetes and their sexual quality of life was low in parallel to this. Both high frequency of SD and the lower sexual quality of life in women with type 2 diabetes are considered to be resulting from the fact that women with type 2 diabetes were in the older age group and most of them were in menopause. While one of the limitations of this study was the lack of a control group, on the other hand, reaching a wide sample group in the study can be considered as the strength of the study.

Conflict of interest None.

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