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Sexual Dysfunction in Women with Type 2 Diabetes

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Abstract

Background: Sexual dysfunction (SD) is one of the most common concerns in women with type 2 diabetes. We aimed to assess the prevalence of sexual dysfunction in diabetic women and to evaluate its associated factors. ***Methods:*** We carried out a cross-sectional study among diabetic women who consented to participate in this study. Sociodemographic and clinical variables were collected, and sexual dysfunction was assessed the Female Sexual Function Index (FSFI). ***Results:*** One hundred forty women with type 2 diabetes, aged 20–65 years, were included in this study. The mean total score of the FSFI was 13.25, and one hundred twenty-two women (87.1%) reported experiencing SD. The results revealed that women's age and hormonal status were significantly associated with the presence of SD. Additionally, the duration of diabetes, fasting blood sugar level, and presence of retinopathy were the factors most strongly associated with SD in diabetic women. According to the Hospital Anxiety and Depression Scale (HADS), there was a significant correlation between depression and female SD. ***Conclusion:*** This study revealed a high prevalence of sexual dysfunction in women with type 2 diabetes. The most associated factors were age, longer duration of diabetes, and retinopathy. SD was common among women reporting depression. The evaluation of sexual function in diabetic women is crucial for the early diagnosis of SD.

Keywords: type 2 diabetes, sexual dysfunction, women's health, quality of life

1. Introduction

Diabetes mellitus is a major public health issue and its prevalence and incidence continue to increase in Tunisia and around the world (WHO, n.d.). According to the International Diabetes Federation (IDF), the prevalence of type 2 diabetes was 8.8% in 2017, with 425 million adults affected, and it is expected to reach a value of 9.9% in 2045 (International Diabetes Federation, 2017).

This disease is associated with multiple chronic complications that negatively impact quality of life (Elham Rahmanian et al., 2019). It is considered a growing healthcare problem associated with cardiovascular and metabolic diseases, as well as sexual health issues, including sexual dysfunction (SD). SD is one of the most

common concerns among women with type 2 diabetes (Shadman Z et al., 2014).

Research indicates that sexual dysfunction can significantly affect the emotional and psychological well-being of women, leading to decreased quality of life and interpersonal relationship challenges. Despite its high prevalence, SD often remains underreported and inadequately addressed in clinical practice. Therefore, it is crucial to assess the prevalence of sexual dysfunction in diabetic women and evaluate the factors associated with this condition (Arcos-Romero AI & Calvillo C, 2023). This study aims to provide insights into the prevalence of sexual dysfunction among women with type 2 diabetes and identify the contributing factors.

2. Materials and Methods

2.1 Participants and Data Collection

We carried out a cross-sectional study among one hundred forty diabetic women who consented to participate in this study and consulted in the endocrinology and diabetology departments of the Intermediate Center in Sousse, Tunisia. Sociodemographic and clinical variables were collected, and sexual dysfunction was assessed via the Female Sexual Function Index (FSFI). The present study was conducted on 30 women with type 2 diabetes selected via simple sampling method from among patients consulting in the endocrinology and diabetology departments of the Intermediate Center in Sfax, Tunisia, from 2013–2014. Patients were eligible if they were aged 20 years or older.

2.2 Measures

Sexual dysfunction was measured in women via a standard questionnaire. The Female Sexual Function Index (FSFI) is a well-known instrument that assesses sexual function in women across six domains: desire, arousal, lubrication, orgasm, satisfaction, and pain during sexual intercourse (Rosen R et al., 2000). For women, the minimum and maximum scores are 2 and 36, respectively. Women with a score less than 26 points were classified as having SD.

Demographic data, including age, BMI, type and duration of diabetes, and glycemic control, were recorded. The presence of hypertension, dyslipidemia, nephropathy, retinopathy, neuropathy, and coronary artery disease was documented.

2.3 Statistical Analysis

For data analysis, the Statistical Package for Social Sciences (SPSS) version 23 was used. The distribution of continuous variables was compared with a normal distribution via the Shapiro–Wilk test. Continuous variables were found to be nonnormally distributed in this study. Quantitative data are reported as medians and quartile intervals. For qualitative data, frequencies and percentages were reported. Correlations were tested via the nonparametric Spearman's correlation test. After univariate analysis, hierarchical multiple linear regression analysis was performed to determine the predictive factors of suicidal ideation among the nursing students. In all the statistical tests, the adopted level of significance was a P-value of 0.05.

3. Results

We collected 140 participants, who had an average age of 56.94 ± 7.90 years. The sociodemographic characteristics of the diabetic women are shown in Table 1. The mean BMI of diabetic patients was 29.87 ± 5.22 (17.95–48.82). The minimum and maximum durations of diabetes were 1 and 30 years, respectively, with a mean duration of 13.6 ± 8.64 years. The majority of patients were receiving oral antidiabetics only (44.3%), whereas 17.1% were receiving insulin therapy. The mean HbA1c level for diabetic women was 9.8 ± 2.04% (5.6–16.2%). Among the studied patients, 26.7% had microangiopathic complications, the most common being neuropathy (63.6%), followed by retinopathy (37.1%) and nephropathy (7.9%). The rate of heart disease among all diabetic women was 12.1%. The mean FSFI score for diabetic women was 13.25 ± 10.08. According to the FSFI cut-off point, the prevalence of SD was 87.1% in the diabetic group. The FSFI domain scores of the two groups are shown in Table 2. All domains of sexual function were affected in diabetic women with SD (SD+). The findings of this study indicate that SD was more prevalent among women with a longer duration of diabetes and microangiopathic complications, especially retinopathy.

The results revealed that women's age and hormonal status were significantly associated with the presence of SD. Additionally, the duration of diabetes and fasting blood sugar level were the factors most strongly associated with SD in diabetic women. According to the Hospital Anxiety and Depression Scale (HADS), there was a significant correlation between depression and female SD.

Table 1. Sociodemographic Characteristics of Diabetic Women

	Frequency (%)

		N=140
Age m (years) (N=140)		57.59 ± 8.66
Origin (%) (N=140)	Urban	85%
	Rural	15%
Educational level (%) (N=140)	Illiterate	25%
	Primary education	44.3%
	Secondary education	25%
	Higher education	5.7%
Employment (%) (N=140)	Unemployed	75.7%
	Employed	24.3 %

Note: m: mean, n: frequency, %: percentage.

Table 2. Comparison of the Domains of Female Sexual Function Index in Diabetic Women with and Without Sexual Dysfunction

Domains of FSFI	SD +	SD -	*P*
Desire	1.72 ± 0.76	3.92 ± 1.11	$<10^{-3}$
Arousal	1.13 ± 1.43	3.96 ± 1.26	$<10^{-3}$
Lubrification	1.36 ± 1.83	4.43 ± 1.25	$<10^{-3}$
Orgasm	1.52 ± 2.03	4.47 ± 1.30	$<10^{-3}$
Satisfaction	3.70 ± 0.96	4.93 ± 0.68	$<10^{-3}$
Pain	1.73 ± 2.32	5.13 ± 1.44	$<10^{-3}$
Total score	11.12 ± 8.71	27.70 ± 6.08	$<10^{-3}$

Note: P: probability; Data were number (%); $p< 0.05$ (Chi-square test); FSFI: Female Sexual Function Index; SD: Sexual dysfunction.

4. Discussion

Diabetes mellitus leads to SD among women and men, affecting the genital organs and many other systems with which these organs function in a coordinated way. Some studies indicate that diabetic women are at risk as much as men in terms of SD (Jamshid Vafaeimanesh et al., 2014). A review of the literature revealed that there are different findings related to the incidence of SD among diabetic women, and this prevalence is estimated to be 20 to 80% (Derosa, G., Romano, D., D'Angelo & A. et al., 2023). In our study, it was 87.1%. For diabetic women, we found a significant reduction in the total score on the FSFI and in most of the items, such as desire, arousal, lubrication, orgasm and satisfaction. This reduction could be due to metabolic and neurovascular factors responsible for the development of complications of diabetes (Sachdeva A, Kumar V, Khullar S, Sharma A & Das A, 2023). In fact, it has been hypothesized that hyperglycemia, by reducing the hydration of mucus membranes, including those in the vaginal tissue, results in poor vaginal lubrication and dyspareunia (Lee HS, Li Z, Kim SO, Ahn K, Kim NN & Park K, 2012). In addition, vascular changes or diabetic damage can change local blood flow and inhibit clitoris engorgement and vaginal lubrication during arousal, resulting in decreased arousal during sexual activity (Rogoznica, M., Perica, D., Borovac, B., Belančić, A. & Matovinović M., 2023). Disorders of arousal, orgasm and sexual pain are the main consequences of diabetic neuropathy (Omidvar S, Niaki MT, Amiri FN & Kheyrkhah F, 2013). In this study, there was a correlation between age and FSFI score. In some previous studies, older age was associated with a higher incidence of SD (Omidvar S, Niaki MT, Amiri FN & Kheyrkhah F, 2013). However, the effects of aging on SD have remained controversial. The effect of glycemic control on rates of SD is also controversial. Some studies have shown that glycemic control has no effect on the incidence of SD in women with diabetes (Camacho ME & Reyes-Ortiz CA, 2005). In contrast, some comments are the opposite (Rogoznica, M., Perica, D., Borovac, B., Belančić, A. & Matovinović M., 2023). In our study, we found no significant association between HbA1c and SD ($P = 0.87$). Considering the chronic nature of sexual dysfunction, prolonged evaluation of glycemic control may provide more reliable results. Another finding of this research was the impact of diabetes duration on SD. Some studies confirmed this

finding, whereas others did not confirm it (Derosa, G., Romano, D., D'Angelo & A. et al., 2023; Mohan G, Mann GS & Sikri T, 2024). In our study, a positive correlation was noted between the duration of diabetes and SD. Other personal factors, such as weight, may also affect this disorder. Some believe that overweight is another factor, but we did not find an association between BMI or waist circumference and SD (Pontiroli, A.E., Cortelazzi, D. & Morabito A., 2013). One of the discussed issues is the effect of other chronic diabetic complications, such as retinopathy and nephropathy, on SD and considering them as risk factors for this complication. Some studies consider some diabetic complications as risk factors for SD (Tang S, An X, Sun W, Zhang Y, Yang C, Kang X, Sun Y, Jiang L, Zhao X, Gao Q, Ji H & Lian F., 2024), and others consider them independent of other diabetic complications (Tang S, An X, Sun W, Zhang Y, Yang C, Kang X, Sun Y, Jiang L, Zhao X, Gao Q, Ji H & Lian F., 2024). In our study, we observed that there was a positive correlation between microangiopathic complications and SD ($P < 0.05$), but no relationship was observed between macroangiopathy and SD ($P = 0.58$). Additionally, no significant association was found between hypertension and SD in our study, ($P = 0.54$). Several previous studies have suggested that psychological factors, such as depression, play a role in SD among diabetic women (Wojujutari, A.K., Idemudia, E.S. & Ugwu L.E., 2024). Because detailed depression measures were not administered to our patients, our study did not assess depression as a mediator of the impact of diabetes on female SD. Owing to the large number of factors that can lead to SD in women with diabetes, effective treatment may entail psychological as well as pharmacological treatment, both of which are applied by trained clinicians, in addition to lifestyle changes and optimal diabetic control (Wojujutari, A.K., Idemudia, E.S. & Ugwu L.E., 2024). Pharmacotherapy alone without addressing psychosocial issues has been proven unsuccessful. Current treatment options are based on hormonal therapies and agents that act either centrally or peripherally. However, further research is needed in this domain for the design of improved treatments (Derosa, G., Romano, D., D'Angelo, A. et al., 2023; Wojujutari, A.K., Idemudia, E.S. & Ugwu L.E., 2024).

5. Conclusion

This study highlights the significant prevalence of sexual dysfunction (SD) among women with type 2 diabetes, with a striking 87.1% of participants reporting some form of sexual impairment. The findings underscore the critical relationship between SD and various factors, including age, duration of diabetes, and the presence of complications such as retinopathy. Additionally, the correlation between SD and psychological factors, particularly depression, emphasizes the need for a holistic approach to diabetes care that includes mental health support.

Given the significant impact of sexual dysfunction on quality of life, healthcare providers must routinely assess sexual health in women with diabetes. Incorporating sexual function evaluations into standard diabetes management can enable early diagnosis and timely interventions, thereby enhancing overall patient well-being. Future research should focus on developing targeted treatment strategies that address both the physical and psychological aspects of sexual dysfunction, ensuring comprehensive care for women living with diabetes. This version maintains the key points while being more succinct.

Abbreviations

International Diabetes Federation: IDF

Sexual dysfunction: SD

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