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Original Research

Prevalence of Erectile Dysfunction in Men with Type 2 Diabetes Mellitus in Osun State, Nigeria

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ABSTRACT: This research aimed to elucidate the prevalence of erectile dysfunction (ED) in men with Type 2 Diabetes Mellitus (T2DM) in Osun State, Nigeria. This is a cross-sectional study involving 200 T2DM patients and 100 non-diabetic controls, selected through random sampling. Structured questionnaires were used to collect data on demographic information, medical history, lifestyle habits, psychological and emotional statuses, and experiences related to erectile function. Anthropometric parameters including height, weight, waist circumference (WC), and waist-hip ratio (WHR) were measured. A significant proportion of T2DM patients experienced erectile dysfunction compared to the control group (62.5% vs 37.0%, p<0.0001). The prevalence of ED was notably higher in individuals who had been diagnosed with T2DM for a longer duration. Pertinently, T2DM patients had higher incidences of complications such as high blood pressure and heart disease, and were more likely to have a history of surgeries or injuries related to the pelvic or genital area. Furthermore, diabetic individuals had significantly higher values in anthropometric parameters such as BMI, WC, and WHR compared to controls, all potentially contributing to the heightened prevalence of ED in this group. The study unearthed a substantial prevalence of erectile dysfunction among T2DM patients in Osun State, Nigeria, with notable associations to both physical and psychological health parameters. The findings suggest a critical need for integrated management approaches addressing lifestyle modifications, psychological support, and timely medical interventions to improve the quality of life of T2DM patients facing erectile dysfunction.

Keywords: Blood sugar levels, diabetes mellitus, erectile dysfunction top of form

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INTRODUCTION

Erectile dysfunction (ED), characterized by the inability to achieve or maintain a penile erection adequate for satisfactory sexual performance, is a common clinical condition that affects the quality of life for many men (Shamloul and Ghanem, 2013). The association between erectile dysfunction and various systemic diseases, particularly cardiovascular disease and diabetes mellitus, has been a focal point of many studies in the past few decades (Gandaglia *et al.*, 2016).

Worldwide, ED affects an estimated 152 million men, and this number is projected to soar to about 322 million by 2025, reflecting the aging global population (McMahon *et al*., 2016). Its prevalence rises with age, but ED is not an inevitable consequence of aging. Instead, the rise in ED prevalence with age can be attributed to increased rates of illnesses such as diabetes mellitus and cardiovascular diseases (Selvin *et al*., 2007).

Diabetes mellitus is a chronic metabolic disorder characterized by persistent hyperglycemia, resulting from defects in insulin secretion, insulin action, or both. It affects an estimated 422 million people worldwide, with type 2 diabetes mellitus (T2DM) accounting for about 90% of the cases (World Health Organization, 2016).

Several studies have indicated a strong association between T2DM and ED. Men with diabetes are 3 times more likely to develop ED than men without diabetes (Giugliano *et al*., 2004a). The mechanisms linking T2DM and ED are multifactorial and include endothelial dysfunction, autonomic neuropathy, reduced nitric oxide availability, and hormonal disturbances (Malavige and Levy, 2009).

In Nigeria, a rapidly developing nation in West Africa, T2DM prevalence has been on the rise due to urbanization, increased sedentary lifestyles, and dietary changes. Recent research indicates that about 5% of the Nigerian adult population is affected by T2DM, with a significant portion undiagnosed (Ogbera and Ekpebegh, 2014).

As for ED among Nigerian men, a study conducted in Southwestern Nigeria reported a prevalence rate of 57.4% among men aged 30-80 years (Afolayan and Yakubu, 2009). However, research focusing on the nexus between T2DM and ED in Nigeria, particularly in regions such as Osun State, remains limited. Given the socio-cultural and health infrastructure peculiarities of the region, there's a need for a localized study.A thorough evaluation of ED in men with T2DM in Osun State would offer insights into the prevalence, severity, and underlying causes of ED in this specific population. Moreover, it can inform healthcare providers and policymakers about the need for better diabetic care and sexual health interventions.

METHODOLOGY

Study setting and participants

The study was conducted in Osun State, Nigeria. A total of 300 male participants were recruited, comprising 200 diagnosed with Type 2 Diabetes Mellitus (T2DM) and 100 non-diabetic controls. Participants were recruited from local diabetes clinics and community health outreach programs. All participants were above the age of 18 and provided informed written consent and were assured of the confidentiality of their responses.

Study design

This was a cross-sectional study, aimed at comparing the prevalence and potential risk factors of erectile dysfunction between diabetic patients and non-diabetic controls.

Data collection

A structured questionnaire was administered to participants to collect demographic data, medical history related to T2DM, lifestyle habits, erectile function, psychological and emotional aspects, and anthropometric measurements.

Anthropometric parameters

Measurements taken included height, weight, body mass index (BMI), waist circumference (WC), and waist-to-hip ratio (WHR).

Data analysis

All collected data was encoded and analyzed using the SPSS statistical software. Descriptive statistics were used to present the data. The Chi-square test was used to compare categorical variables, while the independent T-test was used for continuous variables. A p-value of <0.05 was considered statistically significant.

RESULTS AND DISCUSSION

Age distribution, marital status, and educational level appeared to be fairly similar between the of diabetic patients and control subjects, given the non-significant p-values (Table 1). Most of the diabetic patients have been diagnosed for 6-10 years (Table 2). The majority are following diet and lifestyle modifications and/or taking oral anti-diabetic drugs. Significant differences were observed in smoking habits, alcohol consumption, and engagement in physical activity, with diabetic patients being less likely to smoke or consume alcohol but more likely to engage in physical activity. The diabetic group perceives their overall health to be worse compared to the control group (Table 3). The results further showed that diabetic patients consistently show poorer erectile function across various parameters compared to control subjects, which is significant (Table 4 and Figure 1).The majority of diabetic patients believed that diabetes could influence erectile dysfunction. Diabetic patients reported higher levels of stress and significantly higher symptoms of depression in the past 6 months compared to control subjects (Table 5).Erectile dysfunction had negatively impacted the self-esteem or self-confidence of a substantial proportion of the diabetic group. Diabetic patients, on average, have a higher weight, body mass index (BMI), waist circumference (WC), and waist-hip

Table 1: Demographic Information of Respondents.

Demographic Information	Diabetic Patients n = 200 (%)	Non-diabetic Control n = 100 (%)	p-value
Age (in years)			0.835
Less than 40	11 (5.50)	5 (5.00)	
40 – 49	38 (19.00)	19 (19.00)	
50 – 59	98 (49.00)	49 (49.00)	
60 and above	53 (26.50)	27 (27.00)	
Marital Status			0.908
Single	4 (2.00)	3 (3.00)	
Married	169 (84.50)	82 (82.00)	
Separated/Divorce	19 (9.50)	11 (11.00)	
Widowed	8 (4.00)	4 (4.00)	
Educational Level			0.884
No Formal Education	13 (6.50)	8 (8.00)	
Primary Education	39 (19.50)	20 (20.00)	
Secondary Education	86 (43.00)	43 (43.00)	
Tertiary Education	62 (31.00)	29 (29.00)	

* = significant difference

Table 2: Information about type 2 diabetes mellitus patients.

Variable	Frequency (n = 200)	Percentage (%)
How long have you been diagnosed with Type 2 Diabetes Mellitus (T2DM)?		
Less than a year	11	5.50
1 – 5 years	64	32.00
6 – 10 years	86	43.00
More than 10 years	39	19.50
***What is your current treatment for T2DM? (Tick all that apply) (*n=395)**		
Diet and lifestyle modifications	196	49.62
Insulin	61	15.44
Oral antidiabetic drugs	122	30.89
Other	16	4.05
***Have you ever been diagnosed with any of the following conditions? (Tick all that apply) (*n=411)**		
High blood pressure	131	31.87
Heart disease	38	9.25
High cholesterol	102	24.82
Kidney disease	93	22.83
None	47	11.44

* = multiple responses

Table 3: Health and lifestyle of type 2 diabetes mellitus patients and non-diabetic control.

Variable	Diabetic Patients n = 200 (%)	Non-diabetic Control n = 100 (%)	p-value
Do you smoke?			0.018*
Never smoked	104 (52.00)	36 (36.00)	
Ex-smoker (quit more than 6 months ago)	85 (42.50)	29 (29.00)	
Current smoker	11 (5.50)	35 (35.00)	
Do you consume alcohol?			0.010*
Yes	29 (14.50)	41 (41.00)	
Used to, but quit	94 (47.00)	23 (23.00)	
Never	77 (38.50)	36 (36.00)	
How often do you engage in physical activity?			0.000*
Always	56 (28.00)	9 (9.00)	
Often	75 (37.50)	16 (16.00)	
Sometimes	69 (34.50)	49 (49.00)	
Rarely	00 (0.00)	26 (26.00)	
Never	00 (0.00)	0.00 (0.00)	
Have you had any surgeries or injuries related to the pelvic or genital area?			0.998
Yes	33 (16.50)	17 (17.00)	
No	167 (83.5)	83 (83.00)	
How would you rate your overall health?			0.000*
Very Poor	32 (16.00)	00 (0.00)	
Poor	84 (42.00)	00 (0.00)	
Fair	45 (22.50)	06 (6.00)	
Good	27 (13.50)	50 (50.00)	
Excellent	12 (6.00)	44 (44.00)	

* = significant difference

ratio (WHR) compared to control subjects (Table 6). The current research aimed to study the prevalence of erectile dysfunction (ED) in men diagnosed with type 2 diabetes mellitus in Osun State, Nigeria, and compare the results

Table 4: Erectile dysfunction evaluation of type 2 diabetes mellitus patients and non-diabetic control.

Variable	Diabetic Patients n = 200 (%)	Non-diabetic Control n = 100 (%)	p-value
Over the past 6 months, how often were you able to get an erection during sexual activity?			0.008*
Always	75 (37.50)	63 (63.00)	
Most times (more than half the time)	32 (16.00)	21 (21.00)	
Sometimes	56 (28.00)	13 (13.00)	
A few times	19 (9.50)	03 (3.00)	
Never	18 (9.00)	00 (0.00)	
When you had erections with sexual stimulation, how often were your erections hard enough for penetration?			0.000*
Always	75 (37.50)	65 (65.00)	
Most times (more than half the time)	31 (15.50)	22 (22.00)	
Sometimes	54 (27.00)	09 (9.00)	
A few times	21 (10.50)	04 (4.00)	
Never	19 (9.50)	00 (0.00)	
During sexual intercourse, how often were you able to maintain your erection after you had penetrated your partner?			0.000*
Always	74 (37.00)	65 (65.00)	
Most times (more than half the time)	29 (14.50)	20 (20.00)	
Sometimes	59 (29.50)	11 (11.00)	
A few times	20 (10.00)	04 (4.00)	
Never	18 (9.00)	00 (0.00)	
During sexual intercourse, how often were you able to maintain your erection to completion of intercourse?			0.000*
Always	74 (37.00)	65 (65.00)	
Most times (more than half the time)	28 (14.00)	20 (20.00)	
Sometimes	59 (29.50)	11 (11.00)	
A few times	22 (11.00)	04 (4.00)	
Never	17 (8.50)	00 (0.00)	
Do you experience reduced sexual desire?			0.893
Yes	131 (65.50)	65 (65.00)	
No	69 (34.50)	35 (35.00)	
How many times have you attempted sexual intercourse in the past 4 weeks?			0.001*
0	23 (11.50)	9 (9.00)	
1 – 3	58 (29.00)	12 (12.00)	
4 – 6	47 (23.50)	22 (22.00)	
7 – 10	64 (23.00)	38 (38.00)	
More than 10 times	8 (4.00)	19 (19.00)	
How satisfied have you been with your sexual intercourse?			0.000*
Very satisfied	40 (20.00)	36 (36.00)	
Moderately satisfied	52 (26.00)	41 (41.00)	
Neutral	61 (30.50)	21 (21.00)	
Moderately dissatisfied	17 (8.50)	2 (2.00)	
Very dissatisfied	30 (15.00)	00 (0.00)	
Has your partner expressed concerns or feelings about your erectile difficulties?			0.000*
Yes	114 (57.00)	31 (31.00)	
No	11 (5.50)	6 (6.00)	
Not applicable	75 (37.50)	63 (63.00)	
Have you used any medication or treatments for erectile dysfunction?			0.002*
Yes	111 (55.50)	36 (36.00)	
No	14 (7.00)	01 (1.00)	
Not applicable	75 (37.50)	63 (63.00)	
Do you believe that diabetes could influence erectile disfunction?			0.000*
Yes	172 (86.00)	38 (38.00)	
No	20 (10.00)	13 (13.00)	
Unsure	8 (4.00)	49 (49.00)	
Have you ever experienced anxiety, depression, or stress that affected your sexual performance?			0.001*
Yes	104 (52.00)	29 (29.00)	
No	37 (18.50)	57 (57.00)	
Unsure	59 (29.50)	14 (14.00)	
Are you currently taking any medications that might affect erectile function (e.g., antidepressants, antihypertensive, etc.)?			0.016*
Yes	27 (13.50)	00 (0.00)	
No	78 (39.00)	42 (42.00)	
Unsure	95 (47.50)	58 (58.00)	
Have you ever sought medical treatment for erectile dysfunction?			0.000*
Yes	86 (43.00)	15 (15.00)	
No	49 (24.50)	77 (77.00)	
Unsure	65 (32.50)	8 (8.00)	

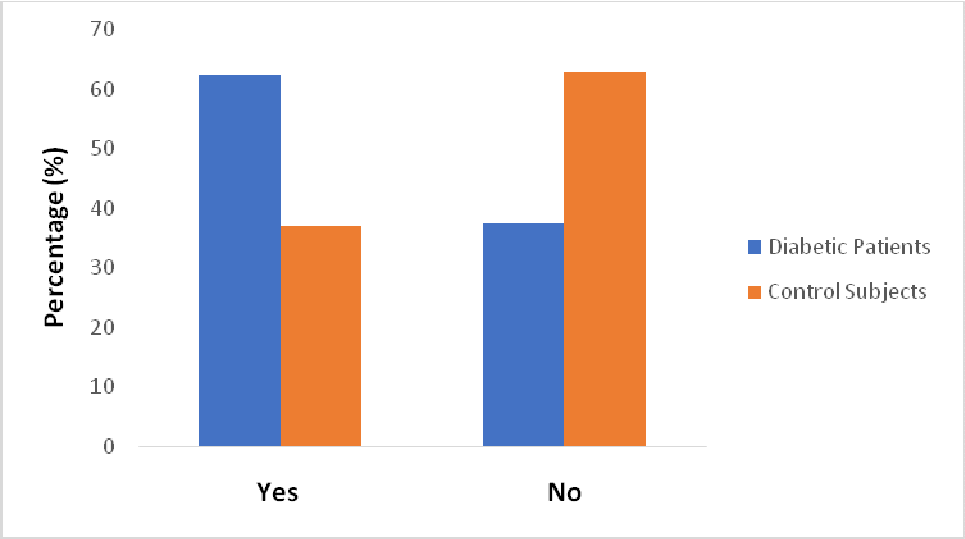

Figure 1: Prevalence of erectile dysfunction

Table 5: Psychological and Emotional Aspects of Type 2 Diabetes Mellitus Patients and Non-diabetic Control.

Variable	Diabetic Patients n = 200 (%)	Non-diabetic Control n = 100 (%)	p-value
How would you describe your level of stress in the past 6 months?			0.049*
Very high	29 (14.50)	26 (26.00)	
High	35 (17.50)	14 (14.00)	
Moderate	57 (28.50)	33 (33.00)	
Low	41 (20.50)	15 (15.00)	
Very low	38 (19.50)	12 (12.00)	
Have you experienced symptoms of depression in the past 6 months?			0.000*
Yes	86 (43.00)	2 (2.00)	
No	114 (57.00)	98 (98.00)	
Do you feel that erectile dysfunction has affected your self-esteem or self-confidence?			0.001*
Yes	91 (45.50)	17 (17.00)	
No	34 (17.00)	20 (20.00)	
Not applicable	75 (37.50)	63 (63.00)	

Table 6: Anthropometric parameters of type 2 diabetes mellitus patients and non-diabetic control.

Anthropometric Parameters	Diabetic Patients (n = 200)	Non-diabetic Control (n = 100)	p-value
Height (cm)	181.06±6.94	178.22±.00	0.083
Weight (kg)	72.92±.25	67.95±.31	0.047*
BMI (kg/m^2)	27.18±3.64	24.21±	0.018*
WC (cm)	99.23±8.356	90.45±36	0.008*
WHR	1.11±0.02	0.92±0.00	0.022*

BMI=Body mass index, WC= Waist circumference, WHR= Waist Hip ratio

with non-diabetic controls. The demographic information provided in (Table 1) sheds light on the similar backgrounds of both diabetic patients and non-diabetic controls, allowing for a more accurate comparison of the prevalence of ED based on diabetes status alone.

The age distribution of respondents, whether diabetic or non-diabetic, is nearly identical across the categories. Previous studies have demonstrated the association of increasing age with a higher prevalence of ED (Bacon *et al*., 2003). Interestingly, both groups in this study showed a significant concentration in the 50-59 age bracket. However, the lack of significant difference in age distribution (p=0.835) ensures that any observed variance in ED prevalence between the two groups can't be attributed to age alone.

Marital status might influence the recognition or reporting of ED due to differences in sexual activity levels or the cultural importance of marital relations. In our study, a vast majority of both diabetic and non-diabetic respondents were married, and there was no significant

difference in marital status distribution (p=0.908) between the two groups. This minimizes the influence of marital status as a confounding variable in the study (Kubin *et al*., 2003).

The role of educational level in recognizing and reporting ED can't be ignored. Higher educational levels may correlate with better awareness of health issues and more willingness to report sensitive conditions like ED (Blanker *et al*., 2001). In our study, the distribution of respondents across different educational levels was very similar between the two groups (p=0.884), suggesting that any observed differences in ED prevalence are less likely to be influenced by the educational background of respondents. The findings of this study suggest that a significant proportion of the study's participants have had T2DM for an extended period. Specifically, 43% have been diagnosed between 6 – 10 years and 19.5% for more than 10 years. Long-term diabetes is known to be associated with numerous microvascular and macrovascular complications (Li *et al*., 2020). The prolonged exposure to hyperglycemia may lead to the damage of blood vessels and nerves that control erection, making erectile dysfunction prevalent in this demographic.

Nearly half (49.62%) of the participants reported using diet and lifestyle modifications as a mode of treatment. This reflects global recommendations, wherein lifestyle interventions remain the cornerstone of T2DM management (American Diabetes Association, 2020). The use of oral anti-diabetic drugs (30.89%) and insulin (15.44%) also aligns with common therapeutic approaches for diabetes. The category of 'Other' treatments, although a minor percentage (4.05%), might include traditional or alternative remedies, which could be of interest for future studies to explore given the unique cultural context of Nigeria.

The results underscore the well-documented interrelation between T2DM and other medical conditions. Approximately 31.87% of respondents reported having high blood pressure. This is unsurprising as hypertension and T2DM often co-exist due to shared risk factors like obesity, an unhealthy diet, and sedentary lifestyle (Kawasaki *et al*., 2021). Moreover, they both can potentiate each other's complications. About 9.25% of participants reported heart disease. Diabetes is a known risk factor for cardiovascular diseases, and the combination can lead to severe outcomes (Low Wang *et al*., 2016). About 24.82% had high cholesterol, another condition frequently associated with T2DM. Both conditions share similar risk factors and can lead to atherosclerosis, which is a common cause of erectile dysfunction (Salman, 2018). Approximately 22.83% reported kidney disease, reflecting the known complication of diabetic nephropathy (Alicic *et al*., 2017).Interestingly, 11.44% reported no co-existing conditions, suggesting a proportion of T2DM patients in Osun State might have good metabolic control or are in the early stages of the disease where complications have not manifested.

The p-value of 0.018 suggests a significant difference in smoking habits between the two groups. The prevalence of current smokers is notably higher in the non-diabetic control group at 35% compared to only 5.5% in the diabetic cohort. This discrepancy may be due to the fact that many individuals diagnosed with Type 2 Diabetes Mellitus (T2DM) are counselled by their healthcare providers to quit smoking, given the associated health risks when combined with diabetes (Willi *et al*., 2007). Smoking is a well-established risk factor for both T2DM and erectile dysfunction (ED) (Bacon *et al*., 2003).

There is a significant difference in alcohol consumption between the two groups (p=0.010). The non-diabetic control group reported a higher percentage of current alcohol consumers (41%) compared to the diabetic group (14.5%). Chronic alcohol consumption has been linked to ED, and it also affects blood sugar regulation, thus potentially exacerbating diabetes symptoms (Seftel, 2002).

An overwhelmingly significant difference in physical activity levels is observed between the two groups (p=0.000). Diabetic patients reported higher levels of regular physical activity compared to non-diabetic controls. Regular exercise is known to enhance blood circulation, including to the pelvic region, which may mitigate the risk of ED (Lamina *et al*., 2009). Additionally, physical activity is a crucial component in the management and prevention of T2DM, which might explain the higher engagement in regular exercise among the diabetic patients (Colberg *et al*., 2016).

No significant difference was found in the history of surgeries or injuries related to the pelvic or genital area between the two groups (p=0.998). Such surgeries or injuries could be potential risk factors for ED due to possible nerve damage, scarring, or altered blood flow (Traish *et al*., 2007).

There was a striking significant difference in how participants rated their overall health (p=0.000). A considerable percentage of diabetic patients rated their health as 'Very Poor' or 'Poor' (58% combined) in contrast to none in the non-diabetic control group. The non-diabetic group majorly rated their health as 'Good' or 'Excellent' (94% combined). Poor self-rated health in diabetic patients might not be surprising given the potential complications and life changes associated with T2DM, including the potential for ED (Maiorino *et al*., 2014).

The results demonstrate a significant association between T2DM and ED. Approximately 62.5% of the diabetic participants reported experiencing ED compared to only 37% of the non-diabetic control group. This observation aligns with previous studies which have established that men with T2DM are at a higher risk of developing ED (Malavige and Levy, 2017).

The pathophysiology linking T2DM and ED can be attributed to several mechanisms.T2DM is associated with impaired nitric oxide synthesis, a critical factor in the erectile process. Endothelial dysfunction impairs the ability of blood vessels to dilate, consequently affecting the blood flow to the penis (Gandaglia *et al*., 2016).

Diabetes can lead to nerve damage, affecting the transmission of signals required for an erection (Feldman *et al*., 1994).Men with T2DM often have reduced testosterone levels, which can further contribute to ED (Dhindsa *et al*., 2004).The psychological stress of managing a chronic disease like diabetes can contribute to ED (Bacon *et al*., 2003).

Interestingly, the rate of ED in the non-diabetic group (37%) indicates that other factors beyond diabetes contribute to ED in the general population. Lifestyle factors such as smoking, alcohol consumption, sedentary behaviour, and obesity can also play a role (Bacon *et al*., 2006).The significant p-value of 0.000* shows a strong statistical difference between the two groups, reinforcing the notion that T2DM is a critical risk factor for ED.

It is evident that men with T2DM exhibit a higher prevalence of ED when compared to their non-diabetic counterparts. Only 37.50% of diabetic patients were always able to achieve an erection, compared to 63% of non-diabetic controls. Similar disparities were seen in maintaining erections during sexual intercourse. This is in line with prior research that indicates a strong association between T2DM and ED (Malavige and Levy, 2009). This association is believed to arise from factors such as endothelial dysfunction, insulin resistance, and microvascular complications (González-Clemente *et al*., 2007).The frequency of sexual intercourse in the past four weeks was lower among the diabetic group. This result might suggest that individuals with T2DM may face challenges in maintaining a regular sexual routine, possibly due to complications associated with their condition.

Interestingly, both groups had similar proportions (approximately 65%) of individuals experiencing reduced sexual desire. This suggests that reduced libido is not solely attributable to diabetes but may also be influenced by other factors. Aging, psychological stress, and systemic illnesses can all contribute to reduced sexual desire (Shifren *et al*., 2008).Only 20% of diabetic patients expressed being "very satisfied" with their sexual intercourse, in comparison to 36% in the control group. Moreover, 57% of diabetic patients reported their partners had concerns about their erectile difficulties, much higher than the control's 31%. These statistics stress the profound impact ED can have on overall sexual satisfaction and relationship dynamics (De Berardis *et al*., 2003).

Notably, 86% of the diabetic group believed that diabetes could influence erectile dysfunction, compared to only 38% of the control group. This disparity might indicate a greater awareness in the diabetic community or could potentially be influenced by personal experiences.

Over half (52%) of the diabetic patients reported experiencing anxiety, depression, or stress affecting their sexual performance, as opposed to only 29% of the control group. The link between diabetes, psychological issues, and ED has been discussed in prior research (Seidman *et al*., 2002). Furthermore, 13.5% of diabetic patients reported taking medications that might affect erectile function. This again corroborates with literature that certain medications can exacerbate ED (Rosen *et al*., 1997).A higher percentage of diabetic patients (43%) sought medical treatment for ED than the control group (15%), indicating either a higher incidence or greater awareness and initiative in the diabetic population.

One salient observation from the results of this study (Table 5) is the disparity in stress levels between the two groups. Notably, the percentage of diabetic patients reporting "Very High" stress was lower than the non-diabetic controls (14.5% vs. 26.0%). However, the overall number of diabetic patients experiencing some form of stress (combining very high, high, and moderate levels) was 60.5%, whereas it was 73.0% for non-diabetic controls. This somewhat unexpected outcome suggests that while T2DM may inherently induce some stress in patients due to the chronic nature of the disease and associated lifestyle changes, other factors in the sampled population might be contributing to heightened stress among the non-diabetic group. It would be worthwhile to further probe what specific stressors are most prevalent among the non-diabetic population in this region (McCoy *et al*., 2013).

The data also indicates a strong association between T2DM and symptoms of depression. A staggering 43% of diabetic patients reported experiencing symptoms of depression in the past six months, in contrast to only 2% in the non-diabetic group. Numerous studies have shown that patients with T2DM have an increased risk of depression compared to the general population (Anderson *et al*., 2001). The pathophysiological changes, the chronicity of the disease, and the need for daily self-management may contribute to the emotional burden experienced by these patients. Furthermore, the bidirectional relationship between diabetes and depression means that not only does diabetes increase the risk of depression, but depression can also impair glycemic control, potentially worsening diabetes outcomes (de Groot *et al*., 2001).

The relationship between ED and self-esteem or self-confidence is evident from the data. Among diabetic patients, 45.5% felt that ED affected their self-esteem or self-confidence, compared to only 17% of non-diabetic controls. This finding aligns with other studies showing that ED is prevalent in men with T2DM and can have profound effects on psychological well-being and quality of life (Seidman and Roose, 2001). The disruption to a man's ability to perform sexually can directly impact their

self-image and self-worth. While it's clear that ED can affect any man, the comorbid presence of T2DM further complicates the situation, as the physiological changes from diabetes can directly contribute to the onset of ED (Giugliano *et al*., 2004b).

The mean height for the diabetic group was slightly higher (181.06±6.94 cm) than the non-diabetic control group (178.22±7.00 cm), though the difference was not statistically significant with a p-value of 0.083. This suggests that there is no significant difference in height between the two groups, and height may not play a pivotal role in determining the association between diabetes and ED.

Weight and BMI showed statistically significant differences between the diabetic and non-diabetic groups. The diabetic patients had an average weight of 72.92±6.25 kg, which is markedly higher than the non-diabetic group's 67.95±6.31 kg. Further, the average BMI in the diabetic group was 27.18±3.64 kg/m^2 as compared to 24.21±3.05 kg/m^2 in the non-diabetic group. This is consistent with previous studies that have demonstrated a significant association between diabetes, increased body weight, and BMI (Kautzky-Willer *et al*., 2016). Increased BMI has also been linked to ED, potentially due to the impacts of obesity on vascular health and hormonal imbalances (Dong *et al*., 2011).

Both WC and WHR showed significant differences between the groups. Diabetic patients had a notably higher WC (99.23±8.356 cm) compared to the control group (90.45±36 cm). Similarly, WHR in diabetic men was 1.11±0.02, significantly higher than 0.92±0.00 in non-diabetic men. Elevated WC and WHR are indicators of central obesity, which has been identified as a risk factor not only for diabetes but also for ED (Esposito *et al*., 2006). Central obesity can lead to impaired vascular function, thereby contributing to the development of ED.
It's also worth noting that this study was conducted within a specific geographical and cultural context (Osun State, Nigeria), and anthropometric parameters can be influenced by a multitude of factors including genetics, diet, and lifestyle, all of which might have specific implications in this setting.

Conclusion and recommendations

The results from this study clearly indicate a higher prevalence of erectile dysfunction among men with T2DM in Osun State, Nigeria, compared to their non-diabetic counterparts. This is in line with global data which suggests a strong association between diabetes and erectile dysfunction.It's worth noting that besides the physiological implications of diabetes, the psychological toll, including higher rates of depression and lowered self-esteem, further compounds the challenges these patients face.In clinical practice, this study reinforces the importance of regular screening for sexual dysfunction in men with diabetes. It also emphasizes the necessity of a holistic approach to patient care that not only addresses glycemic control but also psychological well-being and quality of life.

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