

# Men's sexual desire, and why women often don't recognize it? Prevalence of erectile dysfunction and associated factors among diabetes mellitus patients attending Mettu Karl Comprehensive Specialized Hospital: A cross-sectional study

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## Abstract

**Objective:** The study aimed to assess the magnitude and predictors of erectile dysfunction at Mettu Karl Comprehensive Specialized Hospital.

**Methods:** Male diabetic patients visiting chronic care follow-up at Mettu Karl Comprehensive Specialized Hospital were face-to-face interviewed as part of a retrospective cross-sectional study from April 6, 2022 to May 6, 2022. SPSS version 21 for Windows was used to enter and analyze the data for the descriptive statistics. Following that, a binary logistic regression and a multivariate logistic regression model were used. Based on a  $p$ -value of 0.05, variables that had an independent link with sexual dysfunction were found. The adjusted odds ratio and its associated 95% confidence interval were also used to analyze the direction and intensity of the link.

**Results:** A total of 307 diabetic men participated in the study, with a mean age of (52.74, 16.16) and a mean duration of (5.94, 2.974). In this study, 252 people (82.1%) experienced erectile dysfunction, with mild, moderate, and severe cases represented by 30%, 38%, and 14.1% of respondents, respectively. There were statistically significant associations between erectile dysfunction and age (adjusted odds ratio: 4.8, 95% confidence interval: 1.27–18.32), type of diabetes (adjusted odds ratio: 5.8, 95% confidence interval: 1.96–17.73), and comorbidities (adjusted odds ratio: 0.32, 95% confidence interval: 0.15–0.71).

**Conclusion:** This study showed that the prevalence rate of erectile dysfunction is high in Mettu Karl Comprehensive Specialized Hospital. Age, type of diabetes mellitus, and the presence of comorbidity were factors associated with erectile dysfunction. Therefore, assessment and management of erectile dysfunction in the diabetic clinic should be part of routine medical care during follow-up visits with diabetic patients.

## Keywords

Diabetic mellitus, erectile dysfunction, male, Southwestern Ethiopia

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## Introduction

Diabetes mellitus (DM), a chronic metabolic disorder marked by hyperglycemia and an estimated 30.3 million people in the United States, or 9.4% of the population, have diabetes.<sup>1</sup>

Erectile dysfunction (ED), which can be caused by psychological, neurologic, hormonal, or vascular impairment, is the inability to obtain and sustain an erection strong enough to allow satisfying sexual interaction.<sup>2</sup>

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Diabetic men have a threefold increased risk of ED compared to nondiabetic men.<sup>3</sup> A number of processes such as endothelial dysfunction, the buildup of advanced glycation end products, oxidative stress, autonomic neuropathy, and inflammation of the prostate are involved in the pathogenesis of ED in diabetes.<sup>4,5</sup> Furthermore, hyperhomocysteinemia (HHcys) is a strong and independent predictor of atherosclerosis progression as well as impaired cavernosal perfusion, which leads to ED.<sup>6</sup>

Various studies have indicated a wide range of ED prevalence rates among diabetic males. According to this research, the prevalence of diabetic men is between 35% and 75%, compared to 26% in the overall population.<sup>7</sup>

Age-related neuropathy, vascular insufficiency, poor glycemic management, hypertension, low testosterone levels, and lifestyle variables such as smoking, drinking, and inactivity are the main risk factors for ED in diabetics.<sup>3,8</sup>

The most prevalent psychological issue in the world, ED can cause sadness, social isolation, confidence loss, and self-esteem loss.<sup>9</sup> In addition, it has a considerable negative impact on life quality and marital and marital relationship dissatisfaction.<sup>10</sup> However, some of these detrimental effects can be minimized with good illness management. For instance, multiple studies have revealed that roughly one-third of men with ED experience improved sexual function as a result of lifestyle therapies such as counseling, quitting smoking, weight loss, nutrition, and exercise, as well as optimal glycemic control through diet.<sup>4</sup> Unless the patient is expressly questioned about potential symptoms by the healthcare professional, ED in diabetic individuals is frequently left untreated.

As the number of people with DM rises, there has been less research conducted in Africa and Ethiopia on the prevalence of ED. Therefore, the purpose of this study was to describe the incidence of ED and its contributing factors in diabetes patients who were being followed up at Mettu Karl Comprehensive Specialized Hospital (MKCSH).

## Patients and methods

### Study area, design, and period

From April 6, 2022 to May 6, 2022, a cross-sectional study was done to interview and evaluate medical records regarding sexual dysfunction among diabetes patients. The Mettu Karl Compressive Specialized Hospital, Mettu Town, and Oromia Region served as the study's locations. The hospital only offers one clinic for diabetic care.

### Study participants and eligibility criteria

Incomplete medical records, critically ill patients with diabetic ketoacidosis or hyperosmolar hyperglycemic state, confused, or in septicemia as in an infected diabetic foot

were excluded. Male diabetic patients at MKCSH with age 18 years, duration of diabetes 1 year, and willingness to participate were included. A total of 307 diabetic mellitus patients were included using a consecutive sampling technique by considering the magnitude of the ED from the previous study which was 60.4%.<sup>11</sup>

### Data collection process and management

The data was gathered using a semi-structured data gathering method. A clinical pharmacist was appointed to oversee the data gathering procedure while two nurses, one medical doctor, and one other person were hired for the task. Prior to conducting regular data gathering, the data collecting tool underwent pretesting at the adjacent Bedele General Hospital to ensure consistency. According to the STROCSS (Strengthening of the Reporting of Cohort Studies in Surgery) guidelines, the work has been reported.<sup>12</sup> To ensure the consistency of the data, 5% of the questionnaire was pretested.

### Statistical analysis

The data were entered into a computer using EPI-data version 3.1. The principal investigators had daily checked and cleaned the data. The data were then exported to Statistical Package for Social Sciences (SPSS) 24.0 for analysis. Multivariable logistic regression was used to analyze the variable by using crude odds ratio and adjusted odds ratio (AOR) with 95% confidence interval (CI). All variables associated with the ED at a  $p$ -value  $\leq 0.25$  on the bivariate analysis were entered into a multivariable logistic regression analysis to control for confounders. Finally, the predictors of ED were declared if a  $p$ -value was  $\leq 0.05$ .

**Ethics approval and consent-to-participate.** The Mettu University's Research Ethics Review Committee (RERC), with reference number MEU/CHS/RERC101/2022, granted ethical permission. Written informed consent was obtained from patients. For subjects with no formal education, written consent was taken from their legally authorized representatives. The study protocol was carried out in conformity with the Helsinki Declaration. With the unique reference number "researchregistry 8096," the study was registered on researchregistry.com.

### Operational definitions

- *ED*: Explained by a total score of  $\leq 21$  from 5 items of ED questionnaire.<sup>11</sup>
- *Sever ED*: International Index Erectile Function (IIEF) scoring less than 1–7.
- *Moderate ED*: IIEF scoring between 8 and 11.

- *Mild ED*: IIEF scoring above 12–21.
- *Comorbid illness*: Existence of additional chronic illnesses, including hypertension, cardiac disease, dyslipidemia, psychosis, renal disease, HIV, cancer, asthma, and multiple sclerosis.
- *Poor glycaemic control*: Current fasting blood glucose level greater than 130 mg/dl.
- *Physical activity*: Patients with diabetes who participated in at least 30 min of physical activity daily or participated in a specific exercise session were considered to have adequate physical activity; otherwise, the patient was classified as having inadequate physical activity.
- *Social drug use*: The lifestyle of the patients was assessed during the patient interview. If the patients responded “Yes” to the smoking cigarette, drinking alcohol and chewing a khat, the patients were recorded as smoker, alcohol drinker, and khat chewer, respectively.

## Results

### Sociodemographic characteristics of male diabetic patients

Of the study participants about two-thirds 214 (69.5%) of them were greater than 45 years and about half 154 (50.2%) of them were from rural areas. Regarding their marital status about two-thirds 200 (65.5%) of them were married. About one-third 104 (33.9%) of them were college and above by their educational level. In relation to their occupation, about one-fourth 77 (25.1%) of them were farmer and government employee, respectively (Table 1).

### Clinical characteristics of male diabetic patients

Among the study participants, 257 (83.7%) have normal Body Mass Index (BMI) index whereas 250 (81.4%) of them were patients with type 2 DM. Regarding their medications, about two-thirds, 199 (64.8%) of them were on insulin injection. Of the diabetic patients, about two-thirds, 194 (63.3%) of them had good glycaemic control. The presence of a comorbidity was reported among 205 (66.8%) patients (Table 2).

### Social drug use and lifestyle characteristics of the DM patients

Among the participants, 279 (90.9%) were never-drink-alcohol currently and, about one-third of them, 101 (32.9%) were currently a smoker, and 17 (5.5%) of them were chat chewer (Table 3). Regarding to their physical exercise, about three-fourths of them were physically inactive 245 (79.8%).

**Table 1.** Sociodemographic characteristics of male DM patients attending MKCSH from April 6, 2022 to May 6, 2022.

Variables	Category	Frequency	Percentage (%)
Age (in years)	18–25	18	5.9
	26–35	25	8.1
	36–45	50	16.3
	>45	214	69.7
Area of residence	Rural	154	50.2
	Urban	153	49.8
Marital status	Single	43	14.0
	Married	200	65.1
	Divorced	29	9.4
	Widowed	35	11.5
Income level (in Birr)	Less than 1000	144	46.91
	1001–3000	63	20.52
	>3000	140	45.6
Educational level	No formal education	15	4.9
	Elementary	116	37.8
	High school	72	23.5
	College and above	104	33.8
Occupational status	Farmer	77	25.1
	Merchant	36	11.7
	Private	17	5.5
	Government employee	77	25.1
	Student	22	7.2
	Daily labor	21	6.8
	Other*		18.6

\*Others include daily labor and housewife.

### Prevalence of ED among male diabetic patients

From the total of study participants, 252 (82.1%) were found to have had the ED and 55 (17.9%) are not. In relation to their severity, 92 (30%) were in mild state, 118 (38.4%) were in moderate, and 43 (14.6%) were in severe ED. About half of them, 148 (48.2%) had difficulties of penetration after erection of their penis and about 122 (39.7%) of them were never satisfied with sexual intercourse (Table 4).

### The predictors of ED among male diabetic patients

In binary logistic regression analysis, variables like penis injury, physical exercise, area of the residence, presence of diabetic complication, smoking cigarettes were not entered to multivariable logistic regression analysis because their *p*-values are greater than 0.25. The results of multivariable logistic regression analysis revealed that patients whose age was >40 years was 4.8 times more likely to have ED than age <40 years (AOR: 4.8 (1.27–18.32), 95% CI, *p*=0.023). Similarly patients who had a type 2 DM were 5.8 more likely

**Table 2.** Clinical characteristics of male DM patients.

Variables	Category	Frequency	Percentage (%)
BMI	Under weight	8	2.6
	Normal	257	83.7
	Over weight	42	13.7
Type of DM	Type 1	57	18.6
	Type 2	250	81.4
Duration of DM	1–5	144	46.9
	6–10	136	44.3
	>10	25	8.1
Medication	Metformin	55	17.9
	Insulin	199	64.8
	Metformin + glibnclimide	53	17.3
Glycemic control	Good controlled	194	63.3
	Poor controlled	113	36.8
Blood pressure	Normal	61	19.9
	Pre-hypertensive	84	27.4
	Stage 1 hypertension	105	34.2
	Stage 2 hypertension	57	18.6
Penis injury	Yes	41	13.4
	No	26.6	86.6
Presence of comorbidity	Yes	205	66.8
	No	102	33.3
Type of comorbidity	Hypertension	115	37.5
	Heart failure	10	3.3
	Chronic kidney disease	25	8.1
	Stroke	4	1.3
	Ischemic heart disease	20	6.5
	Asthma	19	6.2
	Other**	16	5.2
	None	98	31.9

\*\*Others include arrhythmia and epilepsy.

**Table 3.** Lifestyle characteristics of diabetic mellitus patients attending MKCSH.

Variables	Category	Frequency	Percentage (%)
Pervious alcohol use	Yes	251	81.8
	No	58	18.2
Current alcohol use	Yes	28	9.1
	No	279	90.9
Pervious cigarette use	Yes	13	4.2
	No	293	95.8
Current cigarette use	Yes	101	32.9
	No	206	67.1
Previous chat use	Yes	109	35.5
	No	198	64.5
Current chat use	Yes	17	5.5
	No	290	94.5
Physical exercise	Yes	62	20.2
	No	245	79.8

to develop ED (AOR: 5.8 (1.96–17.73), 95% CI,  $p=0.001$ ). Finally diabetic male patients that had two or more disease were two times more riskier to have had ED than who did not have (AOR: 3.425 (1.608–7.295), 95% CI,  $p=0.001$ ) (Table 5).

## Discussion

The study revealed that the prevalence of sexual dysfunction among DM patients was 82.1%. This was higher than previous studies done in Jamaica (64%),<sup>13</sup> the Northwest Amhara region (69.5%), Dessie (58.5%), and Jimma (60.4%).<sup>11,14,15</sup> This may be due to variation in study period, study method, lifestyle, and sociodemographic characteristics of the participants.

The results of the current study show that age was significantly associated with sexual dysfunction; 4.8 times more likely than those under 40 to have sexual dysfunction (AOR:

**Table 4.** The ED characteristics among male diabetic patients attending MKCSH.

Variables	Category	Frequency	Percentage (%)
Confidence of patient	No	75	24.4
	Very low	113	36.8
	Low	37	12.1
	Moderate	51	16.6
	High	31	10.1
Penetration of penis	No	39	12.7
	Never	148	48.2
	Few	67	21.8
	Sometimes	27	8.8
	Most times	26	8.5
Erection of penis	Unable	55	17.9
	Never	105	34.2
	Few times	63	20.5
	Sometimes	38	12.4
	Most times	32	10.4
Completion of sex	Always	14	4.6
	Unable	50	16.3
	Extremely difficult	110	35.8
	Very difficult	64	20.8
	Difficult	28	9.1
Satisfaction level	Slightly difficult	40	13.0
	None	15	4.9
	No	57	18.6
	Never	122	39.7
	Few times	52	16.9
	Sometimes	15	4.9
	Most times	47	15.3
	Always	14	4.6

4.8 (1.27–18.32), 95% CI). This is in line with studies done in Tanzania, Jamaica, and Southeast Ethiopia.<sup>16–18</sup>

This can be explained by age-related physiological changes in the testicles and declining sex hormones in older men. Among diabetic patients, indeed, as age increases, the risk of developing peripheral neuropathy, hypertension, and impotency would also increase, which might be the reason for the increased odds of ED.

The current study shows that patients having a comorbidity were three times more likely to develop ED (AOR: 3.425 (1.608–7.295), 95% CI) than their counterparts. The finding was congruent with the study of Jimma, Jamaica, and Tanzania that showed patients with other concomitant medical conditions increase the risk of developing ED.<sup>11,13,16</sup>

This might be because different comorbid illnesses could solely alter the sexual function of individuals, for instance, renal disease results in significant endocrine disturbances, including hypo-gonadism due to reduced renal clearance, the drugs used to manage those comorbid illnesses have a proven side effect on sexual function, for instance, antihypertensive drugs reduce blood flow to the reproductive organs of men that ultimately affects the penile erection capacity and the psychological impact of having a chronic illness.

The current study shows that with reference to Type 1 Diabetes Miletus, the odds of sexual dysfunction among Type 2 Diabetes Miletus patients were 5.8 times higher (AOR: 5.8 (1.946–17.73)). This finding is in line with a study conducted in Tanzania, Jamaica, and southwestern Ethiopia.<sup>16–18</sup> As ED and type II diabetes share similar risk factors like aging, obesity, and high blood pressure, ED might be a common clinical entity among type II diabetes patients, which could explain the observed variation. Regarding surgical therapy, inflatable penile prosthesis placement, scratch technique, and postoperative vacuum therapy are as a combined approach to definitive treatment of ED.<sup>19</sup>

### *Strength and limitation of the study*

As the strength, the social drug use was assessed and, as the limitation, Fasting blood sugar (FBS) was used instead of HbA1C to assess the glycemic control.

### **Conclusion**

This study showed that the magnitude of ED is found to be high; majority of DM patients experienced moderate ED.

**Table 5.** Binary and multivariable logistic regression analysis showing the factors associated with ED among patients of diabetic mellitus in MKCSH, 2022.

Variable	Category	ED		COR 95% CI	p-Value	AOR	p-Value
		Yes	No				
Age	18–40	17	26	1		1	
	>40	235	29	2.9 (1.16–7.68)	0.000	4.8 (1.27–18.32)	0.023
Type of DM	Type 1	23	34	1		1	
	Type 2	229	21	1.16 (8.0–32.22)	0.000	5.8 (1.96–17.73)	0.001
Presence of comorbidity	Yes	189	16	7.312 (3.825–13.979)		3.425 (1.608–7.295)	0.001
	No	63	39	1		1	
Area of residence	Rural	135	19	2.186 (1.190–4.017)	0.23	2.46 (1.117–5.45)	0.25
	Urban	117	36	1		1	
Penis injury	Yes	35	6	0.759 (0.303–1.905)	0.557	–	–
	No	217	49	1		–	–
Physical exercise	Yes	93	19	2.565 (1.345–4.892)	0.304	–	–
	No	209	36	1		–	–
Diabetic complication	Yes	200	12	0.073 (0.036–0.147)	0.400	–	–
	No	52	43	1		–	–
Previous cigarette use	Yes	81	20	1.206 (0.656–2.220)	0.546	–	–
	No	171	35	1		–	–

COR: crude odd ratio; AOR: adjusted odd ratio; p-value: significant association.

Age, type of DM, and the presence of the comorbidity were factors associated with ED. Therefore, assessment and management of ED in the diabetic clinic should be part of routine medical care during follow-up visits with diabetic patients. Besides this, health-care providers should emphasize on screening and treating older patients, type 2 DM patients, and patients presented with a concomitant disease like hypertension and renal disease.

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### Author contributions

FB contributes in the preparation of proposal, methodology, and statistical analysis. LF was participated in preparing the first draft of the manuscript. BG and FD contributed to the editing of the manuscript. All authors checked and confirmed the final version of the manuscript.

### Availability of data and materials

The materials used while conducting this study are obtained from the corresponding author on reasonable request.

### Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Ethics approval

Ethical approval was obtained from the Mattu University's Research Ethics Review Committee (RERC), with reference number MEU/CHS/RERC101/2022. The participants' parents provided their parents with written, fully informed consent. The study protocol was carried out in conformity with the Helsinki Declaration.

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### Informed consent

Written informed consent was obtained from patients. For subjects with no formal education, written consent was taken from their legally authorized representatives.

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### Supplemental material

Supplemental material for this article is available online.

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