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The Relationship of Hba1c Levels with Sexual Function Disorders in Patients with Diabetes Mellitus in the Internment Room of Prof. Dr. H. Aloei Saboe Hospital Gorontalo City

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ABSTRACT

HbA1c is the result of glycemic control of DM patients over the last 2–3 months, so it is more accurate than just using a momentary blood glucose test. Poor HbA1c control has a significant impact on a variety of complications, including impaired sexual function. Sexual dysfunction in diabetic patients is not only influenced by physiological factors, but also by psychosocial factors such as depression, anxiety, and sexual self-perception disorders (sexual self-concept. The purpose of this study is to analyze the relationship between HbA1c levels and sexual function disorders in patients with diabetes mellitus in the internal room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City. The design of this study uses quantitative research with a cross sectional approach. The study population amounted to 74 DM patients with a sample of 42 respondents selected using purposive sampling techniques. The instruments in this study are questionnaires (IIEF) for men and (FSFI) for women. The statistical test used was the chi square test with the result of a p-value = 0.006 (< 0.05) where there was a relationship between HbA1c levels and impaired sexual function in patients with diabetes mellitus. Therefore, it is hoped that health care facilities need to integrate screening for sexual dysfunction disorders in the education program for DM patients

INTRODUCTION

Diabetes mellitus (DM) is a chronic metabolic disease characterized by hyperglycemia due to impaired insulin secretion, insulin action, or both. This disease is becoming a global health challenge with a significant increase in prevalence every year. *The International Diabetes Federation* (IDF) reports that in 2023 there are 537 million adults living with diabetes in the world, and this number is expected to increase to 643 million by 2030 and 783 million by 2045. In Indonesia, the prevalence of DM is also showing an increasing trend, from 2.18% in 2018 to 2.2% in 2023, with an estimated 19.5 million people living with diabetes. This increase does not only occur in the elderly group, but is also starting to be found in the productive age group, so that it has an impact on quality of life, work productivity, and the burden on the national economy and health (Ministry of Health of the Republic of Indonesia, 2024).

Productive age is an important phase in an individual's life because it is at the peak of social, economic, and reproductive activity. However, DM in this age group has the potential to cause various complications, especially if glycemic control is not optimal. One of the complications that often goes unnoticed is impaired sexual function. Sexual dysfunction can appear earlier in patients of productive age and have an impact on psychological well-being, marital harmony, and overall quality of life. Various studies have shown that impaired sexual function in DM patients is closely related to chronic hyperglycemia and the length of time they have diabetes (Sharma *et al.,* 2021).

Long-term glycemic control in DM patients is generally assessed through glycated hemoglobin (HbA1c) examination. The HbA1c test reflects blood glucose levels over the past 2–3 months and is a key indicator of

successful diabetes management. High HbA1c levels are associated with an increased risk of chronic complications such as neuropathy, vascular disorders, cardiovascular disease, as well as dysfunction of organs, including reproductive organs. A number of studies report that poor HbA1c control is significantly associated with an increased incidence of impaired sexual function in both men and women with diabetes mellitus (Li *et al.,* 2023; Yang *et al.,* 2022).

Impaired sexual function in diabetic patients is multifactorial, involving physiological and psychosocial factors. Chronic hyperglycemia can cause autonomic nerve damage, blood flow disorders, as well as hormonal imbalances that directly impact sexual response. In addition, psychological factors such as depression, anxiety, stress, and negative sexual self-perception also aggravate sexual dysfunction in DM patients. Unfortunately, sexual health issues are still often considered taboo so they are rarely expressed by patients or explored in clinical practice, especially in Indonesia (Mentari & Haryanto, 2024).

In Gorontalo Province, the prevalence of DM was recorded at 1.7%, with the number of sufferers reaching more than 18 thousand people in 2023. Data from Prof. Dr. H. Aloei Saboe Hospital in Gorontalo City shows that there will be 431 cases of hospitalization with DM throughout 2024. Based on the results of initial interviews with 10 patients, it showed that 6 patients who had HbA1c levels >6.5% admitted to experiencing sexual problems such as reduced sexual desire, difficulty in orgasm, pain during sexual intercourse, reduced frequency of sexual intercourse and difficult to erect and difficult to erect penis/difficult to tense, there were 2 patients who had HbA1c levels >6.5% but did not experience sexual problems, 2 other patients with HbA1c levels <6.5% said they still regularly had sexual intercourse. However, until now there has been no study that specifically examined the relationship between HbA1c levels and impaired sexual function in DM patients at the hospital.

Based on this background, this study aims to analyze the relationship between HbA1c levels and impaired sexual function in patients with diabetes mellitus in the Internal Room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City. The results of this study are expected to be the basis for the development of more comprehensive nursing and medical services, by paying attention to the aspect of sexual health as an integral part of the management of diabetes mellitus.

METHODS

This study is a quantitative research with the type of observational analytical research and ***a cross sectional*** **approach.** The correlational design was chosen because it aims to determine the relationship between the variable HbA1c level (independent variable) and sexual function disorders (dependent variable) in patients with Type 2 Diabetes Mellitus. The *cross sectional approach* is used because data collection is carried out at one time at the same time, so that it can describe the relationship conditions of the two variables at the time the study is carried out.

RESULTS

Univariate Analysis

Frequency Distribution of Respondent Characteristics by Age

Table 1. Distribution of Respondent Characteristics by Age

No.	Age	Frequency (n)	Percentage (%)
1	25-34 years old	16	38,1
2	35-49 years old	26	61,9
Total		42	100

Source : Primary Data (2025)

Based on table 1 above, the distribution of respondent characteristics based on age in the Internal Room of Prof. Dr. H. Aloei Saboe Hospital in Gorontalo City is mostly 35-49 years old as many as 26 respondents (61.9%) and a small percentage of respondents in the age group of 25-34 years as many as 16 respondents (38.1%).

Frequency Distribution of Respondent Characteristics by Gender

Table 2 Distribution of Respondent Characteristics by Gender

Yes	Gender	Frequency (n)	Percentage (%)
1	Male	18	42,9
2	Women	24	57,1
Total		42	100

Based on table 2. The above shows the distribution of respondent characteristics based on gender in the Internal Room of Prof. Dr. H. Aloei Saboe Hospital Gorontalo City that respondents with male gender as many as 18 respondents (42.9%) and female gender as many as 24 respondents (57.1%), these results show that most of the respondents are women.

Frequency Distribution of Respondent Characteristics by length of time of DM

Table 3 Distribution of Respondent Characteristics by length of DM

Yes	Long Suffering from DM	Frequency (n)	Percentage (%)
1	> 5 years	24	57,1
2	≤ 5 years	18	42,9
Total		42	100

Source : Primary Data (2025)

Based on table 3 above, it shows the distribution of respondent characteristics based on the length of time they have suffered from DM in the Internal Room of Prof. Dr. H. Aloei Saboe Hospital Gorontalo City that respondents who have suffered from DM for a long time for > 5 years as many as 24 respondents (57.1%) and for ≤ 5 years as many as 18 respondents (42.9%), it can be seen that most respondents suffer from DM > 5 years.

Frequency Distribution of Respondent Characteristics by Comorbidities

Table 4 Frequency Distribution of Respondent Characteristics by Comorbidity

Yes	Comorbidities	Frequency (n)	Percentage (%)
1	Anemia	2	4,8
2	Dyslipidemia.	9	21,4
3	Hypertension	9	21,4
4	Diabetic Neuropathy	3	7,1
5	Thyroiditis	6	14,3
6	None	13	31,0
Total		67	100

Source : Primary Data (2025)

Based on table 4 above shows the distribution of respondent characteristics based on comorbidities suffered by DM patients in Internal Room Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City That respondents who suffered from other diseases or comorbidities were 29 respondents (69.0%) with data on hypertension disease 9 respondents (21.4%), dyslipidemia 9 respondents (21.4%), thyroiditis 6 respondents (14.3%), diabetic neuropathy 3 respondents (7.1%), anemia 2 respondents (4.8%) and those who did not have comorbidities as many as 13 respondents (31.0%), it was seen that respondents mostly had comorbidities such as hypertension and dyslipidemia.

Frequency distribution based on the results of HbA1c levels in patients with diabetes mellitus

Table 5 Frequency Distribution Results HbA1c levels in patients Diabetes Mellitus

Yes	HbA1c Rate	Frequency (n)	Percentage (%)
1	Normal	23	54,8
2	Height	19	45,2
Total		42	100

Source : Primary Data (2025)

Based on Table 5 above, it can be seen that the results of the HbA1c levels of respondents were mostly in the normal category, namely 23 respondents (54.8%), for the high category as many as 19 respondents (45.2%).

Distribution of the frequency of sexual dysfunction in patients with diabetes mellitus

Table 6 Frequency Distribution impaired sexual function in patients Diabetes Mellitus

Yes	Sexual Dysfunction	Frequency (n)	Percentage (%)

1	Good	25	59,5
2	Less	17	40,5
Total		42	100

Source : Primary Data (2025)

Based on Table 6 above, it can be seen that the results of sexual function disorders are mostly good, namely 25 respondents (59.5%), while those who are less are 17 respondents (40.5%).

Bivariate Analysis

The relationship between HbA1c levels and impaired sexual function in patients with Diabetes Mellitus in the Internal Room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City

Table 7. Analysis of the relationship between HbA1c levels and sexual function disorders in patients with Diabetes Mellitus in the Internal Room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City

Sexual Dysfunction	HbA1c Rate				Quantity		*p-value*
	Normal		Height				
	f	%	f	%	f	%	
Good	18	42,9	7	16,7	25	59,5	0,006
Less	5	11,9	12	28,6	17	40,5	
Quantity	23	54,8	19	45,2	42	100,0	

Source : Primary Data (2025)

Based on table 7, it shows that most of the respondents who have normal HbA1c levels and have good sexual function are as many as 18 respondents (42.9%), then respondents with high HbA1c levels and have poor sexual function as many as 12 respondents (28.6%), respondents with normal HbA1c levels and have poor sexual function as many as 5 respondents (11.9%) and respondents with high HbA1c levels and have good sexual function as many as 7 respondents (16.7%). The results of *the chi-square* test showed that the *p-value was* 0.006, which means that there is a significant relationship between hbA1c levels and impaired sexual function.

DISCUSSION

HbA1c Levels in Diabetes Mellitus Patients in the Internal Room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City

Based on the results of the study conducted on 42 respondents, it was known that as many as 23 respondents (54.8%) had normal HbA1c levels, while 19 respondents (45.2%) had high HbA1c levels. These results show that more than half of the respondents have achieved good glycemic control, but there is still a large proportion (almost half) who have not managed to control their blood sugar levels optimally. The HbA1c test is used to assess the average blood glucose level in the last 2–3 months, This test is more stable than the measurement of blood glucose at any time, because it is not affected by the consumption of food for a moment. Thus, HbA1c is a key parameter in monitoring therapy effectiveness, patient adherence, and the risk of long-term complications in people with diabetes.

High HbA1c levels in 19 diabetic respondents indicated poor glycemic control, which could be caused by various factors, both in terms of individual characteristics and comorbidities. According to *American Diabetes Association* (ADA, 2023), HbA1c levels <5.7% are considered normal, 5.7–6.4% indicate a risk of prediabetes, and ≥6.5% indicate the presence of diabetes mellitus. A high HbA1c value indicates chronic exposure to excess glucose, causing tissue damage due to the process of protein glycation.

Based on the results of the study, high HbA1c levels were found in most of the respondents who had age characteristics of 35–49 years (61.9%), this result is in line with the research by Rahman (2022) and Chen *et al.* (2023) which suggests that the risk of high HbA1c levels increases significantly after the age of 35. The range of age characteristics is made based on productive age. Sexually productive age is the age range in which an individual reaches biological maturity and has optimal reproductive ability. This range is influenced by biological, hormonal, and social factors. Fertility peaks generally occur between the ages of 20–35 (Utomo *et al*., 2021). After the age of 35, the quality of the ovum decreases so that the chances of pregnancy decrease and the risk of complications increases (Kusumaningrum & Wahyuni, 2022). Meanwhile, the peak of male fertility occurs around the age of 25–35 years. After the age of 40, sperm quality and testosterone levels begin to decline significantly (Suryanto & Nugroho, 2021).

In addition, the long-standing characteristics of suffering from DM can be associated with an increase in HbA1c, with most respondents suffering from DM for more than five years (57.1%). Research by Rahman (2022) showed that patients with long-term DM >5 years had twice the chance of developing HbA1c ≥8% compared to those newly diagnosed for less than 5 years. Research by Rahman (2022) and Chen *et al.* (2023) suggests that the risk of high HbA1c levels increases significantly after the age of 35, especially in patients with a diabetes

duration of >5 years and the presence of comorbidities such as hypertension and dyslipidemia.

In the group with high HbA1c levels, the data also showed the presence of comorbidities such as dyslipidemia (21.4%) and hypertension (21.4%). This condition plays an important role because it increases insulin resistance through endothelial dysfunction and disruption of blood flow to muscle tissue, which worsens the ability of cells to absorb glucose (Esposito & Giugliano, 2022). According to Chen *et al.* (2023), DM patients with dyslipidemia had an average HbA1c level 1.2% higher than patients without dyslipidemia, due to the effects of lipotoxicity that worsened pancreatic beta cell function. In addition, diabetic neuropathy (7.1%) and thyroiditis (14.3%) also aggravate metabolic imbalances. Thyroid disorders cause abnormalities in carbohydrate metabolism, while neuropathy disrupts the autonomic system that regulates glucose balance (Wang, 2024).

Some of the respondents in this study (54.8%) had HbA1c levels within normal limits. This indicates better glycemic control capabilities. In terms of characteristics, normal HbA1c levels were more common in respondents with DM ≤5 years (42.9%). This is in accordance with the findings Park (2023) which states that the shorter duration of the disease means that the beta cells of the pancreas have not been severely damaged, so the body can still produce endogenous insulin adequately.

Normal HbA1c levels reflect optimal glycemic control, which positively impacts the vascular and metabolic health of respondents. Respondents with normal HbA1c had a lower risk of microvascular complications such as retinopathy, nephropathy, and neuropathy. In addition, this condition is also related to better sexual function, since blood flow to the reproductive organs remains smooth and the autonomic nervous system functions normally. (Matsuda, 2024) reports that long-term HbA1c control below 6.5% is associated with increased testosterone hormone levels and decreased erectile dysfunction in male patients with type 2 diabetes. In the long term, maintaining a normal HbA1c not only lowers the number of complications, but also improves quality of life, extends life expectancy, and reduces long-term treatment costs for patients and the health system.

Overall, the results showed that most of the respondents had normal HbA1c levels, but the prevalence of those experiencing high HbA1c levels was still quite large. Researchers assume that this condition indicates that some respondents are not able to control blood glucose optimally. Causative factors include respondent characteristics (age), length of time suffering from DM and comorbidities. The impact of high HbA1c levels is not only related to metabolic complications but also affects sexual function due to vascular and neurological disorders. In contrast, normal HbA1c levels provide protection against long-term complications.

Sexual function disorders in Diabetes Mellitus patients in the Internal Room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City

Based on the results of the study conducted on 42 respondents, it is known that more than half of the respondents still have good sexual function (59.5%), with a proportion of 61% in the "good" category in men and 58% in women. However, there are still 39% of men and 42% of women with "less" results. This figure illustrates that while some respondents are able to maintain their sexual function through good glycemic control and a healthy lifestyle, others experience disruption due to long-term complications of diabetes. Impaired sexual function is a condition in which a person experiences difficulty in one or more phases of sexual response, including the phase of desire, arousal, orgasm, or resolution. Impaired sexual function is a chronic complication that is often overlooked in people with DM, both men and women.

Respondents with the "less" category showed low scores mainly on physiological aspects such as erection quality, lubrication, and orgasm. Based on the data obtained, the lowest scores were found in IIEF items 3 and 4 which assessed the ability to maintain erections and erection satisfaction, as well as FSFI items 5 and 6 which assessed the ability to achieve and maintain lubrication and orgasm. Theoretically, this can be explained through the theory of endothelial dysfunction, in which chronic hyperglycemia results in endothelial damage of blood vessels thereby reducing the release of *nitric oxide (NO)* which plays a role in vasodilation of the penis and vagina. NO deficiency leads to local perfusion disorders and difficulty maintaining an erection or lubrication (Esposito & Giugliano, 2022).

In addition, the diabetic neuropathy theory explains that uncontrollably high blood glucose levels damage the peripheral nerves that regulate sexual sensation and the response of genital reflexes. This is reinforced by Karaca (2021) which suggests that patients with DM duration of more than 10 years have a 2.5 times higher risk of sexual dysfunction due to autonomic nerve damage. The long-term impact of this disorder is not only physiological but also psychosocial, the patient becomes anxious, loses confidence, and is at risk of depression and relationship tension with a partner (Pang, 2021). Clinically, it also has the potential to worsen blood sugar control because chronic stress can increase cortisol secretion and worsen insulin resistance.

Respondents with "good" results showed the ability to maintain high passion, satisfaction, and emotional intimacy. Based on the results of the questionnaire, respondents with good scores tended to have HbA1c <7%, carry out therapy with discipline, and receive emotional support from their partner. Their average IIEF total score ranges from 48–55, while FSFI is at 28–32. Some recent studies also support these results. Singh *et al. (*2023) in a clinical study in men with type 2 diabetes mellitus found an average IIEF score of 52.1 ± 6.8 in the group with good glycemic control and 43.7 ± 9.3 in the group with poor control. While Chen *et al*. (2023) reported that women with HbA1c <7% had an average FSFI score of 31.6 ± 3.9, much higher than the group with HbA1c ≥8%

(26.4 ± 4.7).

The most frequently answered questions (high scores) were IIEF item 1 (sexual desire) and FSFI item 2 (arousal), indicating that basic sexual desire is still fairly preserved despite the occurrence of physiological disorders. Theoretical analysis shows that sexual desire is influenced by psychological and hormonal components (dopamine, testosterone, estrogen). In most respondents, despite the complications of diabetes, the neuroendocrine system that regulates libido has not been completely disrupted. This is in accordance with (Gao, 2022) which mentions that sexual drive is not always reduced in diabetic patients, as long as psychological factors and partner relationships are maintained.

On the IIEF questionnaire, answers to the respondents' sexual desire and orgasm domains showed that the majority were still able to achieve orgasm, although some experienced a decrease in sexual arousal. In addition, most respondents answered in the category of "quite capable" to "always capable" to maintain an erection. As for the FSFI questionnaire, the answer to the Sexual desire domain was that the majority of female respondents showed moderate to high levels of desire. As for the lubrication domain, the response to these two domains is more varied. Some respondents answered that it was difficult to maintain lubrication or difficulty reaching orgasm, which was likely affected by impaired blood flow to the genitals due to diabetic neuropathy or decreased estrogen levels.

From a theoretical point of view, this "good" condition can be explained through a biopsychosocial model, in which sexual function is influenced not only by the physiology of the body, but also by psychological and social aspects. Harmonious emotional relationships and open communication with partners can modulate positive neuroendocrine responses through the release of dopamine and oxytocin, which increase sexual arousal and satisfaction. This proves that interventions to maintain sexual function in DM respondents must be holistic—focusing not only on medical control, but also on mental and relational balance.

The researcher assumes that although most of the respondents of Diabetes Mellitus at Prof. Dr. H. Aloei Saboe Gorontalo Hospital still have good sexual function, there is a significant prevalence with moderate to severe disorders. Physiological factors such as damage to blood vessels and nerves, as well as psychosocial factors such as stress and partner relationships, play a major role in these outcomes. The most frequently answered questions incorrectly describe the presence of vascular and neurological disorders typical of diabetes, while the most answered correctly indicate that psychological and emotional aspects can still be maintained

The relationship between HbA1c levels and impaired sexual function in patients with Diabetes Mellitus in the Internal Room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City

The results of this study found a significant relationship (p = 0.006) between HbA1c levels and impaired sexual function, where as many as 18 respondents (42.9%) with normal HbA1c levels had good sexual function. These results show that optimal blood sugar level control plays a role in maintaining sexual function. HbA1c is an indicator of glycemic control over the past 2–3 months; Normal levels (≤6.5%) indicate stable blood glucose and minimal risk of vascular complications.

Physiologically, good glycemic control maintains vascular endothelial homeostasis and autonomic nerve function, both of which play an important role in the erection process, vaginal lubrication, orgasm, and sexual arousal. Stable blood glucose also reduces the formation of glycation end products (AGEs) that can damage peripheral nerve tissue. According to (Ismail et al., 2024) in *Diabetes Research and Clinical Practice*, type 2 DM patients with HbA1c below 7% had an average IIEF and FSFI score 15–20% higher than those with an HbA1c above 8%. This condition reflects that good regulation of glucose metabolism maintains a balance of reproductive hormones, including testosterone, prolactin, and estrogen, which support libido and sexual satisfaction.

In addition to biological factors, respondents with good glycemic control tended to have a more stable quality of life, confidence, and psychological state, which helped improve the psychosomatic aspects of sexual functioning. Partner support and the ability to manage stress also play a role in maintaining a healthy sexual response even though respondents live with chronic DM.

The results of the study also showed that as many as 7 respondents (16.7%) showed high HbA1c levels but still had good sexual function. This phenomenon can be explained through several physiological and psychosocial compensatory factors. In some cases, the increase in HbA1c levels may be temporary, for example as a result of short-term stress, a momentary high-carbohydrate diet, or temporary non-adherence to therapy, so complications have not yet established significantly.

In addition, some respondents may have strong psychological resilience, regular physical activity, or emotional support from a partner who can maintain sexual function even if glycemic control is suboptimal. This is in accordance with integrative psychosexual theory, in which the components of emotions, interpersonal relationships, and self-perception can strengthen or weaken sexual function regardless of physiological factors. Research Rosen & Riley (2022) in *Journal of Sexual Medicine* report that men with high HbA1c but have levels of relationship satisfaction and *Self-esteem* good ones still show a high IIEF score. This confirms that psychological aspects and interpersonal relationships play an important role in maintaining sexual function, even

under suboptimal physiological conditions. This condition may also reflect the presence of compensatory hormonal factors in some patients, such as testosterone levels that are still quite high or good sensitivity of androgen receptors, so the effects of hyperglycemia on libido are not too significant.

In the category of normal HbA1c levels and lack sexual function, there were 5 respondents (11.9%), namely respondents with normal HbA1c but experiencing impaired sexual function. This phenomenon confirms that good glycemic control does not always guarantee normal sexual function, as there are other multifactorial factors that also influence. Some possible causes include age, hormonal disorders, depression, psychological stress, relationship disorders, as well as side effects of antihypertensive drugs or antidepressants commonly used by DM respondents. In women, normal HbA1c levels are not always followed by a balance of the hormone estrogen, which plays an important role in maintaining lubrication and sexual arousal.

In addition, diabetic neuropathy that has occurred due to a long history of DM (>5 years) can be *irreversible*, so that even though blood glucose has been controlled, the nerve and endothelial damage that has occurred has not been completely recovered. This theory is supported by Feldman *et al*. (2022) which states that damage from chronic oxidative stress to peripheral nerve tissue takes a long time to recover, even after sugar levels are stabilized.

Most of the respondents with high HbA1c levels (12 respondents or 28.6%) experienced impaired sexual function. These results are the clearest picture of the influence of chronic hyperglycemia on the physiological and psychological function of DM respondents. High HbA1c levels signal poor glycemic control, which leads to increased oxidative stress, vascular endothelial damage, and decreased production of nitric oxide (NO), an important molecule in the mechanism of erection and genital lubrication. In addition, high sugar levels cause microangiopathy and autonomic neuropathy, which inhibit nerve impulses and blood flow to the genital organs. These results are in line with research by Abdellatif *et al.*, (2025), which reported that patients with HbA1c >7.5% were 2.3 times greater risk of sexual dysfunction compared to patients with HbA1c <6.5%. This correlation suggests that poor glycemic control has a direct impact on vascular and peripheral nerve function.

The biological explanation of this relationship involves a non-enzymatic glycation mechanism in endothelial proteins, which leads to decreased production *nitric oxide* (NO), thereby inhibiting the vasodilation needed in the erection process and sexual response. Pallin *et al.*, (2025) in *Diabetes Care* also confirms that high HbA1c increases the risk of autonomic neuropathy that affects sexual function. São Paulo *et al.*, (2025) added that HbA1c levels also correlate with levels of the hormone asprosin which affects energy metabolism and sexual desire. These results reinforce that glycemic control affects not only vascular complications, but also hormonal aspects involved in the human sexual response.

One of the complications of diabetes mellitus, namely diabetic neuropathy with symptoms of increased HbA1c levels can result in sexual dysfunction (Laksita *et al.*, 2021). Another study in Germany proved there was a link between erectile dysfunction and HBA1c in male patients with DM. Another study in Ethiopia suggests there is a significant link between glycemic control and erectile dysfunction (Gobena *et al.*, 2023). Research conducted by Shakeri in Iran found a significant association with increased HbA1c levels with female sexual dysfunction DM (Puspitasari *et al.,* 2024). Research in India explains there is a significant relationship between HbA1c levels and women's sexual function. Another study in Poland found that there was a link between increased HbA1c levels and female sexual dysfunction. Cieri *et al.* (2025) added that an increase in HbA1c results in microcirculatory damage that impacts the perfusion of genital tissue and decreases the ability to erectile and lubricate in women.

Overall, the results of this study show that there is a significant relationship between HbA1c levels and impaired sexual function in Diabetes Mellitus respondents ($p = 0.006$). Researchers assume that poor glycemic control has been shown to increase the risk of sexual dysfunction in both men and women. This relationship was reinforced by the characteristics of respondents with productive age and a long time suffering from relatively long DM.

CONCLUSION

Based on the results of research in the Internal Room of Prof. Dr. H. Aloei Saboe Hospital Gorontalo City, it is known that HbA1c levels in patients with diabetes mellitus are mostly in the normal category and sexual function disorders are mostly in the good category. The results of *the Chi-Square* test showed a *p value* of 0.006 ($p < 0.05$), so it can be concluded that there is a significant relationship between HbA1c levels and impaired sexual function in patients with Diabetes Mellitus in the Internal Room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City.

ADVICE

This research is expected to be a reference for health workers to integrate screening for sexual dysfunction disorders as part of routine services for patients with diabetes mellitus, especially in patients with HbA1c levels ≥7%, as well as provide comprehensive education on the importance of glycemic control. Patients with diabetes mellitus are advised to keep HbA1c levels within controlled limits through the application of a healthy diet, regular physical activity, and adherence to recommended therapies, and are expected to

communicate complaints related to sexual function openly to health workers for appropriate and early treatment. In addition, researchers are further advised to conduct studies with a longitudinal or cohort design and involve a wider population to evaluate the causal relationship between glycemic control and impaired sexual function more comprehensively.

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