

The Effect of Sexual Education with the Plissit Method on Sexual Function Disorders in Type 2 DM Patients at the Limboto Health Center

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Article Info

Article history:

Received 16 Dec, 2025

Revised 19 Jan, 2026

Accepted 04 Mar, 2026

Keywords:

Diabetes Mellitus, Sexual Disorders, PLISSIT Method

ABSTRACT

Diabetes Mellitus is a chronic disease that is progressive and has a serious impact on the body's metabolic system. The PLISSIT model stands for four levels of intervention, namely Permission, Limited Information, Specific Suggestions, and Intensive Therapy. This study aims to determine the effect of sexual education with the PLISSIT method in reducing sexual function disorders in type 2 DM patients at the Limboto Health Center. The research method is using a quasi-experimental approach. The design used is a one group pretest-posttest design. The sample was taken using a non-probability sampling technique with a purposive sampling technique from a total population of 398 respondents to 44 respondents. The research instrument using Sexual Education with the PLISSIT Method was carried out according to SOP procedures and used IIEF and FSFI Questionnaires to measure the level of sexual disorders in men and women. The results showed that there was a statistically significant difference between the Pre FSFI and Post FSFI scores with a Z value of -5.061 and a significance value (p-value) of 0.000. Because the p value < 0.05, the Pre IIEF and Post IIEF p values are .000, where $p < \alpha$ (0.05) is obtained, so it is concluded that H1 is accepted, meaning that there is an Effect of Sexual Education with the PLISSIT Method on Sexual Function Disorders in Type 2 Diabetes Mellitus Patients at Limboto Health Center. This research is expected to integrate sexual education of the PLISSIT method in the routine services of type 2 DM patients, especially in health education sessions and chronic disease clinics.

INTRODUCTION

Diabetes Mellitus is now one of the leading causes of global deaths, which is very worrying. Based on a report from the World Health Organization (WHO), in 2021, diabetes directly caused around 1.6 million deaths worldwide. More worryingly, almost half of those deaths, about 47%, occurred in individuals under the age of 70. In addition, serious complications due to diabetes also contribute to global mortality (WHO, 2024).

Meanwhile, the International Diabetes Federation (IDF) in 2024 reports that about 589 million adults aged 20 to 79 will be living with diabetes globally. Of these, the Southeast Asian region accounts for around 78.3 million cases. Indonesia, in particular, is listed as the only country in Southeast Asia that is ranked in the top 10 countries with the highest number of diabetics in the world. It is estimated that there will be around 19.5 million people with diabetes in Indonesia by 2024, a figure that shows the urgency of more serious treatment of this disease (IDF, 2024).

Based on data from the Ministry of Health of the Republic of Indonesia in 2021, the number of people with diabetes in Indonesia reached 19.5 million people and is expected to continue to increase to 28.5 million people in 2045. Meanwhile, the results of the 2023 Indonesian Health Survey (SKI) show that the prevalence of diabetes mellitus is still a serious health issue, with 11.7% of the population aged 15 years and older having

high blood sugar levels, both diagnosed and undiagnosed (Safinatin Najiyah et al., 2024).

Based on data obtained from the Gorontalo Provincial Health Office, Gorontalo residents suffering from DM in 2023 are in Bone Bolango Regency with a total of 5,469 cases, followed by Gorontalo Regency with 4,547 cases, North Gorontalo Regency 2,825 cases, Pohnato Regency 1,671 cases, Gorontalo City 1,426 cases, and Boalemo Regency with 1,281 cases (Gorontalo Provincial Health Office, 2023).

Diabetes mellitus is often considered the dominant disease affecting the elderly. However, the facts on the ground show that the productive age group is also inseparable from this risk. In the productive age group, DM sufferers face a double burden, namely having to stay active in work, play a role in the family, while maintaining their reproductive health and sexual life. Furthermore, the threat of diabetes mellitus can even appear from a young age. Modern lifestyles such as lack of physical activity, consumption of high-calorie foods, stress, and smoking habits and lack of sleep make the productive age more susceptible to this disease. This condition proves that diabetes is no longer just a degenerative disease that only appears in old age, but has now become a serious problem that also threatens the younger generation and the productive age (Moch Rizal, 2021).

The results of a systematic review and meta-analysis conducted by (Gebeyehu et al., 2023) show that impaired sexual function is a fairly common complication experienced by diabetic patients worldwide. Impaired sexual function in patients with type 2 diabetes mellitus is a real but often overlooked complication. Many patients are reluctant to talk about sexual complaints because they are considered taboo, while health workers often feel unprepared to discuss them openly. As a result, this aspect is rarely detected and treated, although it has a major impact on the quality of life of patients. In Indonesia, limited research and cultural influences further reinforce the lack of attention to this issue, so interventions that are able to bridge communication and sexual handling in clinical practice are needed (Murphy et al., 2024; Rahayu et al., 2020).

In the context of health services, this condition not only demands special attention to patients, but also emphasizes the importance of the role of nurses in providing more comprehensive care. Therefore, an intervention approach is needed that does not only focus on the physical aspect, but also includes the psychosocial and sexual dimensions of the patient. One of the approaches that can be used is sexual education using the PLISSIT method. This method is a systematic approach developed by Jack Annon in 1976 designed to assist health workers in dealing with sexual problems systematically. This method consists of four stages of intervention: Permission, Limited Information, Specific Suggestions, and Intensive Therapy, and aims to bridge communication between patients and health workers on sexual issues that are often considered taboo, including in the context of nursing care for patients with chronic conditions such as type 2 diabetes mellitus (Oskay et al., 2011; Damayanti et al., 2023).

The application of the PLISSIT model is in line with the importance of sexual education as an integral part of the management of type 2 diabetes mellitus which also provides psychosocial support for patients. This is in line with the fifth pillar in diabetes management according to the American Diabetes Association (ADA), namely education and psychosocial support (Hartono & Ediyono, 2024).

Based on the results of initial observations at the Limboto Health Center, of the ten patients with diabetes mellitus of productive age (15-49) who routinely participate in the PROLANIS program (chronic disease management program), five people admitted to experiencing complaints during sexual intercourse. Two female patients reported dryness in the genital area and pain during intercourse, one other woman had difficulty reaching orgasm, one female patient admitted to experiencing a decrease in sexual arousal, while one male patient reported difficulty maintaining an erection in sexual activity. All of these patients were unaware that the complaints they experienced were related to complications of diabetes mellitus. When accessing health services, nurses' attention is more focused on metabolic aspects, so the issue of sexual function tends to be neglected. In addition, cultural influences, awkwardness, and the assumption that sexual topics are taboo make patients reluctant to talk about them openly, even to health workers.

RESEARCH METHODS

Research Design

The research method is using a quasi-experimental approach. The design used is a one group pretest-posttest design. Sampling using the Non-probability sampling with techniques purposive sampling From a total population of 398 respondents to 44 respondents. The research instrument using Sexual Education with the PLISSIT Method was carried out according to SOP procedures and used IIEF and FSFI Questionnaires to measure the level of sexual disorders in men and women

RESULTS

Table 1 Characteristics of Respondents

Categories	n	%
Gender		
1. Male	8	18,2
2. Women	36	81,8
Age		
1. Young Adults (20-29 years)	0	0
2. Adults (30-49 years old)		
3. Old Adults (50-59 years old)	44	100
Marital Status		
1. Married	0	0
2. Unmarried		
Jobs		
1. Civil Servants/TNI/Polri/BUMN/BUMD	100	100
2. Private employees	0	0
3. IRT		
4. Miscellaneous	15	34,1
Education		
1. SD	1	2,3
2. Junior High School	26	59,1
3. High School	2	4,5
4. Diploma/Bachelor's		
Long Suffering from Diabetes Mellitus	3	6,8
1. <5 years old	11	25,0
2. >5 years	15	34,1
Medications Consumed	15	34,1
1. None		
2. Oral		
3. Insulin	39	79,5
4. Oral & Insulin	9	20,5
Smoking		
1. Yes	7	15,9
2. No	32	72,7
Disease Complications	1	2,3
1. Erectile abnormalities	4	9,1
2. Complaints during sexual activity	3	6,8
	41	93,2
	8	18,2
	36	81,8

Based on table 1. The characteristics of the respondents can be seen to be concluded that the gender in this study as large is female which is female which is 36 respondents (81.8%) aged 30-49 years (adult) totaling 44 respondents (100%) with marital status in this study all patients are married which is 44 respondents (100%). Some female respondents worked as IRTs totaling 26 respondents (59.1%) with high school and diploma/undergraduate education levels totaling 15 respondents (34.1%), as most suffered from Diabetes Mellitus <5 years which amounted to 39 respondents (79.5%) and had drugs consumed, namely oral drugs totaling 32 respondents (72.7%). Almost most of the respondents did not smoke, namely 41 respondents (93.2%) and as a majority had complications of the disease complained during sexual activity which amounted to 36 respondents (81.8%)

Univariate Analysis

Table 2 Distribution of research samples based on pre-test and post-test IIEF and FSFI

Univariate Analysis	Quantity	
	n	%
FSFI Pre-Test		
Normal	3	8,3
FSD	33	91,7
FSFI Post-Test		
Normal	3	8,3
FSD	33	91,7
Pre-test IIEF		
Normal	2	25,0
Lightweight	3	37,5
Light-Moderate	1	12,5
Medium	1	12,5
Weight	1	12,5
Post-test IIEF		
Normal	4	50,0
Lightweight	2	25,0
Light-Moderate	1	12,5
Medium	1	12,5
Sexual Dysfunction		
Normal	7	
Disruption	37	

Based on table 2. The results of the FSFI pre-test were obtained by most of the respondents, namely 33 respondents (91.7%) who had an FSD score and a small part, namely 3 respondents (8.3%) had a normal score. The IIEF pre-test was obtained as many as 3 respondents (37.5%) who had a light score and a small part, namely 1 respondent (12.5%) had a light-medium, medium score and a heavy score. Based on the FSFI post test, most of the respondents, namely 33 respondents (91.7%) who had an FSD score and a small number, namely 3 respondents (8.3%) had a normal score. The IIEF pre-test was obtained as many as 4 respondents (50.0%) who had normal scores and a small part, namely 1 respondent (12.5%) had a mild-medium score and a moderate score. s Some of the men were 4 respondents (50.0%) who had a disorder score and 33 female respondents had a disorder score. Some men have a normal score of 4 respondents and women, namely 3 respondents who have a normal score.

Bivariate Analysis

Table 3. The Effect Of Sexual Education With The Plissit Method On Sexual Function Disorders

Sexual Education with the PLISSIT Method	FSFI				Sig. (2-tailed)
	FSD		Normal		
	N	%	N	%	
Pre-Test	33	91,7	3	8,3	,000
Post Test	33	91,7	3	8,3	

DISCUSSION**The Rate of Sexual Function Disorders in Type 2 Diabetes Mellitus Patients Before Being Given Sexual Education with the PLISSIT Method in Women**

Based on the results of the study conducted on 44 respondents at the Limboto Health Center, it was found that there were 33 female respondents (91.7%) who had an FSD score. This suggests that many respondents have levels of stress, worry, anxiety, or personal discomfort with their current sexual functioning.

Based on the respondents' answers to the FSFI, especially in the domains of sexual desire (question number 1) and lubrication (question number 5). Low sexual desire can be influenced by various factors, such

as chronic health conditions, hormonal changes, psychological stress, fatigue, and emotional factors in relationships with partners. The majority of respondents also reported infrequent or inconsistent lubrication frequency. The answer reflects a disturbance in the lubrication domain, which is physiologically related to the female sexual response. Insufficient lubrication can cause discomfort during sexual intercourse, decrease sexual satisfaction, and ultimately negatively impact overall sexual function.

The findings of this study are in line with the studies of Enzlin et al. (2009) and Nowosielski et al. (2010) which stated that women with diabetes mellitus have a higher risk of impaired sexual function, especially in the domain of desire and lubrication. The study confirms that sexual dysfunction in women with diabetes is multifactorial, involving a combination of metabolic, hormonal, vascular, and psychosocial factors.

Based on research conducted on 44 respondents at the Limboto Health Center, as many as 3 respondents (8.3%) had a normal score. Based on respondents' answers to the FSFI questionnaire, respondents with normal scores showed the ability to experience sexual stimulation consistently during sexual activity. In addition to the adequate frequency of stimulation, respondents also assessed that the intensity of stimuli experienced was at a moderate to high level, which supports the optimal sustainability of sexual activity.

This is in line with a study by Ismail et al., (2021), who introduced a new grading system for female sexual dysfunction, researchers reported that the majority of participants had sexual dysfunction 339 women (67.8%) were classified as having FSD while the rest (about 32.2%) were in the non-dysfunction category and the total FSFI score in the dysfunction group was much lower than in the non-dysfunction group.

The Rate of Sexual Function Disorders in Type 2 Diabetes Mellitus Patients Before Being Given Sexual Education with the PLISSIT Method in Men

Based on research conducted on 44 respondents at the Limboto Health Center, it was found that there was a small percentage of men, namely 1 respondent (12.5%) had a mild-medium, medium score and a severe score.

Based on the research conducted by the researcher, the respondents' answers to IIEF questionnaires number 2 and 3 were obtained describing the existence of levels of erectile dysfunction, ranging from mild to moderate to severe. Lower scores on both questions directly contributed to a decrease in the total score of the erectile function domain, so respondents could be classified into different levels of erectile dysfunction.

In respondents with mild-moderate erectile dysfunction, previous research explained that this condition generally still allows erections to occur, but the quality and consistency decrease, for example, erections are not always hard enough or difficult to maintain until the end of sexual intercourse. Studies by Rosen et al. and McCabe et al. suggest that mild-moderate erectile dysfunction is often associated with psychological stress, fatigue, performance anxiety, or lifestyle factors such as smoking and low physical activity. At this stage, sexual function has not been completely disrupted, but it has begun to have an impact on sexual satisfaction and male confidence.

Based on research conducted on 44 respondents at the Limboto Health Center, 3 respondents (37.5%) had a light score for men. In a study conducted by Ponzolzer et al., (2005), it was shown that most men with erectile dysfunction were at a mild degree, making it the most common category compared to the heavier degrees. This happens because erectile dysfunction generally develops gradually. In the initial phase, physiological changes such as decreased blood flow to the penis, hormonal response disorders, and nervous disorders due to metabolic factors have not completely eliminated the ability to erection, so the disturbances that appear are still mild. In addition to biological factors, psychological factors such as stress, performance anxiety, fatigue, and work pressure also play a role in the emergence of mild erectile dysfunction that tends to fluctuate, so more men fall into this category.

The Rate of Sexual Function Disorders in Type 2 Diabetes Mellitus Patients After Being Given Sexual Education with the PLISSIT Method in Women

Based on the results of a study conducted on 44 respondents at the Limboto Health Center after being given an intervention, it was found that 33 female respondents (91.7%) who had an FSD score experienced a slight increase in score after being given an intervention. Categorically, there was no change in the number of respondents from the sexual dysfunction category to the normal category. Nevertheless, the FSFI score showed an improvement in almost all female respondents, especially in the domains of desire, stimulation, and sexual satisfaction. These findings indicate a quantitative improvement in sexual function, although the increase has not yet reached the FSFI cutoff value to be classified as normal sexual function.

This is in line with research by Abdelkhaliek et al., (2024), which showed that the mean FSFI value increased significantly from 19.5 (\pm 3.7) before intervention to 23.3 (\pm 4.1) after counseling, indicating improvement in sexual function. Sharma and Ghosh (2021), examined 120 women with type 2 diabetes mellitus and evaluated sexual function using FSFI. The study concluded that sexual dysfunction was more common in women with longer duration of DM, poor blood sugar control (high HbA1c), and the presence of complications of peripheral neuropathy.

Based on the results of a study conducted on 44 respondents at the Limboto Health Center after being given an intervention, it was found that there were 3 female respondents (8.3%) who had normal scores.

In a general population study in the Netherlands, A Survey of Female Sexual Functioning in the General Dutch Population (2017), which involved 521 sexually active women aged 20–80 years, the results showed that most of these women had sexual function within the normal range. Factors associated with "normal" sexual function include relatively younger age, adequate frequency of sexual activity, and absence of chronic diseases/extreme hormonal changes (Lammerink et al., 2017).

Levels of Sexual Function Disorders in Type 2 Diabetes Mellitus Patients After Being Given Sexual Education with the PLISSIT Method in Men

Based on the results of the study conducted on 44 respondents at the Limboto Health Center after being given intervention, it was found that in men, a small percentage, namely 1 respondent (12.5%) had a mild-medium score and a moderate score.

In respondents with mild–moderate erectile dysfunction, research by Rosen et al. (1997) and amplified by McCabe and Althof (2014) showed that sexual counseling interventions such as PLISSIT generally provided significant improvements in IIEF scores, especially in the domain of the ability to achieve and maintain an erection. At this level, erectile dysfunction is often influenced by psychological factors such as performance anxiety, stress, and lack of sexual information, so that the Permission and Limited Information stages in PLISSIT are quite effective in improving erectile function, although in some respondents the improvement has not completely restored erectile function to the normal category.

Based on the results of the study conducted on 44 respondents at the Limboto Health Center after being given intervention, it was found that in men most of the respondents, namely 4 respondents (50.0%) had a normal score.

Based on research conducted by Birowo et al. (2019), it shows that most male respondents are in the category of normal erectile function, while only a small percentage experience erectile dysfunction. These findings were analyzed in relation to the characteristics of respondents who were relatively younger, the majority were married, had a good level of education, and had minimal severe chronic comorbidities. This condition plays a role in erectile function because vascular, hormonal, and psychological integrity is still relatively maintained.

Levels of Sexual Function Disorders in Type 2 Diabetes Mellitus Patients with Sexual Education With PLISSIT Method in Men and Women

The results of this study show that impaired sexual function occurs in both sexes even with different distributions and intensities. In male respondents, 4 people (50.0%) showed a disorder score, while the other 4 people had a normal score based on IIEF criteria to assess male sexual function. These findings indicate that half of all male respondents in the sample experienced some level of disruption that could impact their quality of sexual life.

In female respondents, it was found that 33 people had a disorder score while only 3 showed normal scores based on FSFI. This illustrates that the majority of women in this study sample experienced impaired sexual function that was measurable in various domains of sexual function such as desire, stimulation, lubrication, orgasm, satisfaction, and pain, which overall lowered the FSFI score.

In general, sexual dysfunction is not a single phenomenon that relies on a single factor, but rather is a multidimensional condition that is influenced by biological, psychological, social, and medical factors. Other research suggests that the prevalence of sexual dysfunction can vary greatly depending on the characteristics of the population studied. For example, in studies of patients with type 2 diabetes, it was found that there was a high prevalence of sexual dysfunction, although most respondents did not actively engage in sexual intercourse within a given period, which made it difficult to assess with IIEF and FSFI but showed that sexual problems remained significant among diabetic patients (Rosen et al., 2000).

Analyzing the Difference in the Degree of Sexual Function Disorders Before and After Sexual Education Intervention with the PLISSIT Method in Women

Based on the results of the Wilcoxon Signed Ranks Test, there is a statistically significant difference between the Pre FSFI and Post FSFI scores with a Z value of -5.061 and a significance value (p-value) of 0.000. Because the p < value is 0.05, it can be concluded that there is a significant difference between FSFI scores before and after the intervention. From the Ranks table, it can be seen that as many as 33 subjects (91.67%) experienced an increase in FSFI scores from pre-test to post-test with a mean rank of 17.00 and a sum of ranks of 561.00. None of the subjects experienced a decrease in score (negative ranks = 0), while 3 subjects (8.33%) had the same score between pre-test and post-test. H1 is accepted, meaning that there is an Effect of Sexual Education with the Plissit Method on Sexual Function Disorders in Type 2 Diabetes Mellitus Patients at Limboto Health Center.

Educational interventions using the PLISSIT method have been proven to be effective in improving sexual function in both women (FSFI) and men (IIEF). The PLISSIT method consisting of Permission, Limited Information, Specific Suggestions, and Intensive Therapy works by helping individuals or couples understand physiological changes due to illness, reduce sexual anxiety, and provide specific strategies to overcome the

obstacles experienced.

This is in line with research conducted by Abdollahi et al. (2019), Examining the effects of PLISSIT in women with type 2 DM. After 4 weeks of PLISSIT education, there was a significant increase in FSFI scores, and the percentage of women with FSD decreased significantly. Researchers concluded that PLISSIT is effective because it reduces sexual anxiety and improves knowledge.

Analyzing the Difference in the Degree of Sexual Function Disorders Before and After Sexual Education Intervention with the PLISSIT Method in Men

Based on the results of the paired t-tets test, it was shown that in the male group before the intervention was carried out to provide sexual education with the plissit method, it had an average of 16.5000 ± 4.62717 . After the intervention was carried out, sexual education by the plissit method changed where the average was 6.02376 ± 9.6250 . Thus there was an average change of 10.47624. With a p value of .000, where $p < \alpha$ (0.05) was obtained, so it was concluded that H1 was accepted, meaning that there was an Effect of Sexual Education with the Plissit Method on Sexual Function Disorders in Type 2 Diabetes Mellitus Patients at Limboto Health Center.

Educational interventions using the PLISSIT method have been proven to be effective in improving sexual function in both women (FSFI) and men (IIEF). The PLISSIT method consisting of Permission, Limited Information, Specific Suggestions, and Intensive Therapy works by helping individuals or couples understand physiological changes due to illness, reduce sexual anxiety, and provide specific strategies to overcome the obstacles experienced.

Based on research conducted by Karimi et al., (2019), it shows a decrease in sexual dysfunction after education with the PLISSIT method in line with various previous studies that confirm the effectiveness of this approach in improving sexual function in patients with chronic diseases, including type 2 diabetes mellitus. The PLISSIT model comprehensively addresses the psychological components, couple's communication, as well as biological limitations that contribute to sexual dysfunction

CONCLUSION

Based on the FSFI pre-test, most of the respondents, namely 33 respondents (91.7%) had an FSD score and a small part, namely 3 respondents (8.3%) had a normal score. The IIEF pre-test was obtained as many as 3 respondents (37.5%) who had a light score and a small part, namely 1 respondent (12.5%) had a light-medium, medium score and a heavy score. Based on the FSFI post test, most of the respondents, namely 33 respondents (91.7%) who had an FSD score and a small number, namely 3 respondents (8.3%) had a normal score. The IIEF pre-test was obtained as many as 4 respondents (50.0%) who had normal scores and a small part, namely 1 respondent (12.5%) had a mild-medium score and a moderate score. From the results of data analysis using SPSS Version 26, it was found that there was a statistically significant difference between the Pre FSFI and Post FSFI scores with a Z value of -5.061 and a significance value (p-value) of 0.000. Because the p value < 0.05 , the Pre IIEF and Post IIEF p values are .000, where $p < \alpha$ (0.05) is obtained, so it is concluded that H1 is accepted, meaning that there is an Effect of Sexual Education with the PLISSIT Method on Sexual Function Disorders in Type 2 Diabetes Mellitus Patients at Limboto Health Center.

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