

Managing Type 2 Diabetes through Diet and Exercise: Effects on Sleep and Sexual Health in Men from Mazar-e-Sharif, Afghanistan (1398-1399)

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ABSTRACT

The control of type 2 diabetes by diet, exercise and its positive effects on sleep and sexual performance of men in the conditions of Afghanistan in the city of Mazar-e-Sharif between the years 1398-1399 among 200 referring patients in private home examination and Balkh hospital of the Faculty of Medicine of the Balkh University of Afghanistan.

Keywords- control of type 2 diabetes, exercise and its effects on sleep and sexual performance of men in Afghanistan.

I. INTRODUCTION

Diabetes is one of the most common diseases IN WORLD and about 285 million people in the world are suffering from this disease, which is expected to reach 439 million people by 2030 (1). In Iran, more than 3 million people have diabetes (2).

Officials of the Afghan Ministry of Health say that 5.8% of the Afghan population is at risk of diabetes. On the occasion of World Diabetes Day, the Ministry of Health of this country has made it possible for free diabetes examination in Kabul.

II. DIABETES IS THE EIGHTH CAUSE OF HUMAN DEATH?

Maternal diabetes is considered one of the non-communicable diseases and the eighth cause of human death worldwide. This disease can lead to blindness, heart diseases or other health problems. According to the statistics of the Ministry of Public Health of Afghanistan, 422 million people worldwide are suffering from diabetes, of which 199 million are women.

According to speculations, this figure will increase to 600 million tons by 2035.

Dr. Syed Habib Arwal, head of non-communicable disease control in Afghanistan's Ministry of Public Health, told DW that in a survey conducted in 2010, 2.3 percent of Afghans were suffering from diabetes, but new surveys show that these figures has gone up. Mr. Arwal said: "Unofficial figures so far show that 5.8 percent of Afghans are at risk of diabetes."

The Ministry of Public Health of Afghanistan has said that nearly 20,000 people die annually in this country as a result of diabetes. This ministry is trying to prevent the deaths of this disease with an awareness campaign.

According to the ministry's press release, Dr. Mamousi Zivar, Deputy Ministry of Public Health, said that a total of more than 849,000 people in Afghanistan suffer from this disease and 19,773 people die every year due to this disease.

Sleep and whole grain bread reduce the risk of diabetes. In 2017, the number of people with diabetes reached more than 450 million people worldwide. With a healthy way of life, the risk of type 2 diabetes can be reduced.

Researchers from a Japanese university have found out in their new research on mice that even sleeping less than six hours a night increases the risk of developing diabetes.

World Health Organization: 2.7 million Afghans suffer from diabetes

The Ministry of Public Health of Afghanistan warned on the World Health Day about the increase in the incidence of diabetes in this country. Officials in the ministry said that about eight and a half percent of the Afghan population suffers from this disease.

Dr. Richard Peppercorn, the representative of the World Health Organization in Afghanistan, said that about half a billion people in the world are suffering from diabetes, and most of these patients have type 2 diabetes, which can be diagnosed and treated.

But Mr. Peppercorn said that the eastern Mediterranean region, including Afghanistan, has the highest rate of diabetes in the world, and according to him, only in this region, 43 million people have diabetes.

The latest statistics published by the World Health Organization about diabetes:

The number of people with diabetes has increased from 108 million in 1980 to more than 425 million.

- The global prevalence of diabetes in people over 18 years old has increased from 4.7% in 1980 to 8.5% in 2014.

The prevalence of diabetes is higher in poor and low-income countries.

Diabetes is the main cause of blindness, kidney failure, heart attack, stroke and amputation of lower limbs.

In 2016, 1.6 million deaths were directly related to diabetes, and another 2.2 million deaths were attributed to high blood glucose. About half of the deaths due to high blood glucose are reported in people less than 70 years old.

2 million and 700 thousand people in Afghanistan suffer from diabetes

Type 2 diabetes in Iranian people over 60 years old was reported to be more than 22% in 2012 (3). Diabetes is one of the most common non-communicable diseases of the century. This disease is considered not only as the most important cause of cardiovascular disorders, blindness; It also plays a role in the incidence of sexual impotence and sleep quality (4). The chronic nature of diabetes affects the patient's body, mind, and individual and social functioning; Therefore, it is very important to examine the different aspects of health and quality of life in these patients (5). About 90% of diabetics have type 2 diabetes (6). Behavioral and environmental factors such as weight gain, obesity, and exercise are among the main factors of type 2 diabetes (7). The risk of sexual dysfunction in diabetic patients increases due to the occurrence of neurological, vascular, hormonal problems and suffering from other chronic diseases such as kidney disease, blood pressure and

obesity (8). Sexual dysfunction is the most common complication of diabetes related to sex (9). Sexual dysfunction in diabetic men is in the form of decreased libido, ejaculation dysfunction, erectile dysfunction and finally, sexual dysfunction. In diabetic women, this disorder includes sexual dissatisfaction, orgasm and lubrication disorders. These disorders are caused by psychological, hormonal, nervous and vascular problems (10). Studies have shown that factors such as diet, sleep and drug treatment affect erectile dysfunction. Based on the studies, the lowest prevalence of erectile dysfunction is in Britain and Italy with 35% and the highest prevalence in Japan with 90% (11). In Iran, the prevalence of erectile dysfunction in type 2 diabetic men is estimated at 18.8%, 45% of them have severe erectile dysfunction, 37% have moderate erectile dysfunction, and 18% have mild erectile dysfunction (8). In the study conducted at Imam Hospital and Tobay Clinic in Sari, the prevalence of sexual dysfunction in diabetic women was reported as 78.7%, which includes: 58% lubrication problems, 50% decreased libido, 50% problems with arousal, 47.3% pain, 32.7% complained of orgasm disorder and 42.7% of sexual dissatisfaction (1).

Sleep is a basic human need that is necessary to maintain energy, appearance and physical well-being (13). Insomnia causes hormonal, behavioral and physical disorders and also reduces the quality of a person's life (13). Illness can affect the quality and quantity of sleep. And poor sleep quality causes low quality of life. Inadequate sleep quality is evident in type 2 diabetes and disturbed sleep is more frequent in type 2 diabetes (14). On the other hand, sleep disorder increases the activity of sympathetic nerves, increases the level of cortisol in the evening and increases the level of growth hormone, leading to an increase in insulin resistance and a decrease in glucose tolerance (15). Research by American researchers shows that people who sleep less than 6 hours a night are more prone to abnormal blood sugar disorders and type 2 diabetes. The results have shown that those who lack sleep are more likely to suffer from increased fasting blood sugar and type 2 diabetes (14). Diabetes is a self-management disease; Because 99% of care is the responsibility of the patient (16). Self-efficacy can enable a person to adopt health-promoting behaviors and abandon harmful health behaviors (18). Self-efficacy is actually a person's belief and expectation based on his capacity to influence the desired outcome through individual efforts that a person monitors nutrition and physical activities using self-efficacy tools in order to control blood sugar and can prevent the complications of these diseases (18, 19). Healthy sexual activity plays an important and fundamental role in the mental health of men and women, family formation and stability, prevention of disputes, misunderstandings and the collapse of marital relationships, as well as its unfortunate consequences (20), therefore, knowing the factors affecting sexual performance in the way of planning care for Diabetic patients, education and

follow-up of these patients is essential. This study was conducted with the aim of investigating the correlation between the self-efficacy of type 2 diabetic patients with their sleep quality and sexual performance.

III. ANALYSIS METHOD

This descriptive-correlational study was conducted on type 2 diabetic outpatients on sexual function in Mazar-e-Sharif, Afghanistan.

It was done in 1399---2018. The samples were selected according to having type 2 diabetes and willingness to participate in the study. The minimum sufficient volume for the number of 300 patients of the customers hospital of Balkh University Faculty of Medicine was estimated to be 200 using Cochran's formula with an error percentage of 0.05.

Inclusion criteria include:

Being married, having a history of type 2 diabetes for at least 5 years, willing to participate in the study and being over 35 years old.

Those who had recently received sexual health education.

Exclusion criteria include:

Also, people with type 1 diabetes, cancer and mental disorders were excluded from the study.

After explaining the purpose of the research, they completed the questions of the questionnaire by the individual interview method, then the information related to the experiment was extracted from the patients' files. In order to comply with research ethics and subjects' rights, both orally (before implementation) and in writing (on top of the questionnaire), the volunteers were assured.

The requested information in the questionnaires is only for research purposes and there is no need to mention the name, surname and other personal characteristics except for the determination of gender. Data collection was done 6 days a week at a specific time for 3 months. Data were analyzed using SPSS version 20 statistical software, frequency distribution tables, mean \pm standard deviation (for data description) and Pearson correlation coefficient (for data analysis). The significance level was considered 0.05.

IV. LIMITATIONS OF THIS STUDY

The patient's failure to cooperate with the researcher on traditional customs and traditions of the country can be pointed to the lack of a control group, cross-sectional data collection, and failure to examine people's behaviors, such as observing diet and exercise as an objective and accurate method instead of using a questionnaire.

The research materials and methods in the research were:

1- Demographic questionnaire: This questionnaire contains 11 questions including: age, marital status,

gender, education, income, family economic status, occupation, history of illness, type and duration of illness, examination of patient tests in terms of FBS-FBS2 level. It was HBA1C-CR-HB-TG-CHOLESTEROL.

2- Sleep quality questionnaire: This questionnaire originally has 9 items, but because question 5 contains 10 sub-items; Therefore, the whole questionnaire has 19 items, including things such as quality of sleep (mind from the person's point of view), the amount of sleep at night and the sufficiency of sleep from the person's point of view. Also, this tool measures things like falling asleep more than 30 minutes late, using sleeping pills to fall asleep, waking up in the middle of the night due to frequent urination, shortness of breath, feeling cold, hot, and waking up due to pain and any of the members during the last month. It is examined and scored with a 4-point Likert scale from 0 to 3.

The grading method is as follows: no sleep problem (score zero), moderate sleep problem (score 1), serious sleep problem (score 2),

3- Self-efficacy scale in diabetes management: This scale was created in 1999 by Vander et al. This questionnaire contains 19 questions that measure the patient's ability to follow the diet, the level of physical activity and measure blood sugar. Questions are scored on an 11-point Likert scale from "I can't at all", a score of 0, to "I definitely can't", a score of 10. The range of scores is between 0-190. The findings of the reliability analysis showed that all four factors have internal consistency coefficient, acceptable and significant retesting over time. Also, all four subscales and the whole questionnaire have an acceptable internal consistency coefficient.

These results were consistent with the research findings of McDowell et al. (2005), Sturt, Hearnshaw and Wakelin (2002). The internal reliability findings confirm this psychometric principle that Cronbach's alpha value increases as the number of questions increases; This means that Cronbach's alpha of the whole scale is higher than its subscales ($r=0.8$). These findings were consistent with the results of Vuein's study (2006). Therefore, it can be concluded that the Iranian version of DMSES has favorable psychometric components (22).

4- Sexual performance tool in women: This multidimensional tool was first developed by Rozen et al. in 2000. FSFI is a tool used internationally. This questionnaire has 19 questions and measures women's sexual performance in terms of sexual desire (2 items), sexual stimulation (4 items), wetting (4 items), orgasm (3 items), satisfaction (3 items) and pain (3 items). look into it. The scores considered for each question were sexual desire (1-5), sexual arousal, vaginal moisture, orgasm, sexual satisfaction and pain (0-5). The total scores of each dimension by calculating the coefficient, sexual desire coefficient (0.6), sexual arousal (0.3), vaginal moisture (0.3), orgasm (0.3), sexual satisfaction (0.4) and pain (0.4) is obtained. The range of the

dimension of sexual desire is 1.2-6 points and other dimensions are 0-6 points and the range of the total score of sexual dysfunction is 1.2-36 points. A higher score indicates a better sexual function. Cutoff points for sexual desire (2.1), sexual arousal (2.8), vaginal moisture (2.8), orgasm (2.6), sexual satisfaction (3), pain (3) and for total performance index score Gender is (28). The validity and reliability of the Persian version of this tool has been confirmed by Mohammadi (2013), Fakhri (2013) and Ghaseminia (2013) ($r = 0.8$) (23).

5- International Erectile Function Scale: This scale includes 5 questions whose answers are graded on a 5-point Likert scale from 1 to 5 points. The range of scores is between 5-25 points and a score less than 21 indicates erectile dysfunction. Finally, based on the score obtained from the scale, people are classified into four categories: severe erectile dysfunction (5-105), moderate erectile dysfunction (11-15), mild erectile dysfunction (16-20), and normal status (21-25). The reliability coefficient of this scale in Bener's study was 0.96 (24). In this study, for the reliability of 4 questionnaires, the test-retest method was used, and for this purpose, the questionnaires were given to 10 patients with type 2 diabetes in two stages, 10 days apart, and the correlation of the two tests for the self-efficacy scale It was calculated as 0.84 in diabetes management, 0.77 for

sexual function in women, 0.87 for international erectile function scale, and 0.81 for sleep quality.

V. FINDINGS

Among 200 patients with diabetes, there were 101 women with an average age of 52.3 ± 8.8 years and 99 men with an average age of 54.9 ± 7.5 years, 23.5% of whom had university education and 76.5 % were undergraduates. The average duration of the disease was 9.4 ± 5.7 , and more than half of the patients, 56.5%, had less than 10 years of their disease. The average number of children was 3 ± 2 . Most of the patients (38%) had high blood lipids and 32.5% had no other disease apart from diabetes (Table 1). Among the studied variables, age above 60 years and below 49 years had a significant correlation with sexual performance in men and women ($p < 0.001$), and the correlation coefficient was -0.55 in men and -0.61 in women; This means that sexual performance declines with age. Sexual function also showed a significant correlation with the disease duration variable ($p < 0.001$), and the correlation coefficient was -0.34 in men and -0.37 in women; That is, with the increase in the duration of the disease, the sexual performance decreased.

Table No. 1: Demographic characteristics and some information related to type 2 diabetes patients in Balkh University Faculty of Medicine customers hospital from 2018 to 2019

Variable	Floors	Number	Percent
Age (years)	Less than 40	11	5/5
	49-40	55	27.5
	50-59	67	33.5
	More than 60	67	33.5
sex	Men	99	49.5
	women	101	50.5
number of children	without children	19	9.5
	One or two children	74	37
	Three or four children	60	30
	Five or more	47	23.5
Education	literate	35	17.5
	Elementary	43	21.5
	Guidance	29	14.5
	high school	46	23
	university	47	23.5
Chronic Diseases	none	65	32.5
	blood pressure	35	17.5
	fat	76	38
	Kidney	5	2.5
	Heart	14	7
	Other	5	2.5

duration of illness	Less than 10 years	113	56.5
	10 to 14 years	50	25
	15 to 19 years	24	12
	20 years and more	13	6.5

The average score of self-efficacy in men was 143.7±2 and in women was 147.8±24.8.

The mean score of erectile dysfunction was 11.7 ± 5.7. 91.9% of men with type 2 diabetes had erectile dysfunction, of which 44.4% had severe erectile dysfunction, 23.2% had moderate erectile dysfunction, and 24.2% had mild erectile dysfunction. (Table No. 2).

Table No. 2: Classification of erectile dysfunction

Classification	Frequency	Percent
Intense	44	4.44
Medium	23	2.23
Mild	24	2.24
Normal	8	1.8
Total	99	100

Pearson's correlation coefficient test results; It showed a statistically significant correlation between self-efficacy (p<0.002) and erectile dysfunction in men with type 2 diabetes, and the correlation coefficient was 0.31. The average sleep quality score was 7.6±4.7 in men and 8.1±4.8 in women. The results of the test

showed a statistically significant correlation between self-efficacy (p<0.003) and sleep quality in type 2 diabetes patients, and the correlation coefficient was -0.21; That is, with the increase in self-efficacy, the score of sleep quality decreased; In other words, sleep quality improved (Table 3).

Table No. 3: Correlation between self-efficacy variables and sexual performance

Indicator performance	Efficacy	Male sexual
Efficacy	r=0.31	p>0.002
Function	r=0.33	-
Women's sexual performance	r=0.33	p>0.001
sleep quality	r=0.21	p>0003

The average score of women's sexual performance index was estimated as 14.6±9.4 (range 1.2-36) and 100% of women had a sexual performance index less than 30.2 (Table 4).

Table No. 4: Sexual performance index score

Index Number	Number	Maximum Score	Minimum Score	Mean± Standard Deviation
Male sexual performance	99	24	5	7.5±7.11
sexual desire	101	6	0	1.2±2.5
arousal	101	6	0	2.4±1.7
humidity	101	5.4	0	2.2±1.5
orgasm	100	6	0	2.3±1.5
satisfaction	99	6	0	2.5±1.9
the pain	99	6	0	2.5±1.9
Women's sexual performance	99	30.2	0	14.6±9.4

61.4% decreased sexual desire, 66.3% decreased sexual arousal, 77.2% decreased vaginal moisture, 73.3% failed to orgasm, 72.3% experienced sexual dissatisfaction, and 72.3% experienced pain during intercourse. They were. The results of Pearson's correlation coefficient showed a statistically significant correlation between self-efficacy (p<0.001) and sexual dysfunction in women with type 2 diabetes, and the correlation coefficient was determined as 0.33. Also, statistically significant correlation between self-efficacy and sexuality, 0.37; sexual arousal, 0.33; Sexual satisfaction was 0.35 and pain was 0.35. No statistically

significant correlation was observed between vaginal moisture (0.18) and orgasm (0.26) (Table 5).

Table No. 5: Frequency of sexual disorder in different dimensions and correlation between self-efficacy variables and women's sexual performance

Indicator	Percent	Women's self-efficacy
sexual desire	4.61	p=0.00, r=0.37
sexual arousal	3.66	p=0.100, r=0.33
vaginal moisture	2.77	p=0.770, r=0.18
orgasm	3.73	p=0.010, r=0.26

sexual satisfaction	3.72	p=0.00, r=0.35
the pain	3.72	p=0.00, r=0.35

VI. DISCUSSION AND CONTROVERSY

In the present study, it was conducted with the aim of determining the correlation between self-efficacy and sleep quality and the incidence of sexual dysfunction in type 2 diabetic patients and diabetic men. The results showed that it is possible to predict the correlation between sexual dysfunction and sleep problems in a positive way based on self-efficacy. Wu et al reported that self-efficacy plays an important role in adherence to self-care behaviors and better control of type 2 diabetes. In fact, knowing and cultivating self-efficacy with its components can be an effective strategy to increase the feeling of efficiency and effectiveness in diabetic patients and act as a buffer against diabetes (28). The findings of the present study, along with the results of other clinical studies, showed more evidence of the close relationship between the effect of self-efficacy in performing self-care behaviors in type 2 diabetic patients. In other words, with the increase in self-efficacy, the ability to deal with chronic diseases such as diabetes increases and complications such as sleep problems and sexual dysfunction decrease. In the present study, type 2 diabetes had a negative effect on sexual performance, and with increasing self-efficacy, sexual performance improved. In fact, the feeling of self-efficacy, in addition to having a positive effect on diabetes management and compliance with medical orders to cure diabetes, can reduce diabetes-related complications, such as increasing sleep problems and reducing healthy sexual function. Having healthy and safe sexual relations increases satisfaction and life satisfaction in couples, and this also has a reciprocal effect on improving sleep quality and increasing self-efficacy. In research, it has been shown that in men, hyperglycemia causes erectile dysfunction by changes in penile vessels, decreased blood circulation, endothelial cell dysfunction, and as a result, reduced nitric oxide production and insufficient relaxation of melasma muscle fibers (7). In women, diabetes reduces the hydration of the mucous membranes of the body, such as the vagina, and causes a decrease in lubrication during sexual intercourse and dyspareunia. Hyperglycemia increases the risk of genital and urinary infections in women, which leads to an increase in dyspareunia in diabetic women (7). This finding is consistent with the results of our findings and the study of Basok and Nowosielski (29,30). Diabetes has a negative effect on women's sexual performance by causing hormonal, vascular, nervous and psycho-social disorders (29). Also, diabetes causes a change in the level of androgen, estrogen and sex hormones connected to globin, and this

has an adverse effect on sexual performance (30); Therefore, having high self-efficacy can target and correct the negative effects of diabetes, i.e. the decrease in sexual performance in women and men, as well as the decrease in sleep quality. It seems that self-efficacy as a psychological ability can affect health problems and chronic diseases such as type 2 diabetes and minimize its complications.

Zhu et al stated that patients with type 2 diabetes have a high percentage of sleep disorders, which has a negative effect on blood glucose control (34). Lou et al also showed that in patients with type 2 diabetes, unfavorable sleep is common, which has an inverse relationship with quality of life (4). Rafalson et al also stated that the blood glucose disorder in people who sleep less at night is 3 times more common in people with normal sleep duration (35).

It is worth mentioning that important differences can be seen between people's attitudes and beliefs, despite their similarities. These differences include not performing self-care behaviors correctly, such as not adhering to diet, mobility, dependence on treatment in response to self-efficacy.

The findings of this research showed that self-efficacy can play a role in type 2 diabetic patients and predicts the process of sexual dysfunction and sleep problems; Of course, this finding needs more replication. Therefore, self-efficacy is an important factor in better sexual satisfaction and improving sleep quality in type 2 diabetic patients. Self-efficacy in the management of type 2 diabetes leads to reduction of sexual performance problems, reduction of sleep problems and prevention of mental and emotional damage caused by type 2 diabetes. Also, reducing conflicts, improving relationships and achieving satisfaction in marriage, for the durability and stability of the family, is done with self-efficacy in diabetes management, and self-efficacy makes coping with diabetes easier and the complications caused by diabetes, such as sleep problems and sexual function, are reduced. In this study, sexual performance in type 2 diabetic patients had a significant relationship with age and duration of the disease. This finding with the results of Teles et al.'s study; Lindau et al. and Geirsson, who showed that aging causes changes in penile organs, decreased blood circulation, decreased androgens, and as a result increased erectile dysfunction in these patients, were consistent (37-39). Evidence shows that increasing age and duration of illness also affects sexual performance, which is somewhat normal, but overall, it seems that a clear correlation has been established between self-efficacy, sexual dysfunction, and sleep quality.

The important role of this research was to provide research confirmations regarding the correlation of self-efficacy with sexual dysfunction and sleep quality in type 2 diabetic patients. In the present study, it was not possible to access type 1 diabetic patients in the sample size, since such complications are also possible

in type 1 diabetes, so it is recommended to conduct a correlation of self-efficacy with sleep problems and sexual function in type 1 diabetic patients. to give more clarity to the findings of this research. Also, the findings of this study could only be generalized to type 2 diabetic patients and did not include other patients.

VII. CONCLUSION

The results of the present study showed that type 2 diabetes has an effect on sexual performance and sleep quality, and self-efficacy in managing diabetes has an impact on people's expectations regarding their ability to act in future situations in the field of sexual performance and sleep quality. There is also a significant correlation between self-efficacy and sleep quality and sexual performance in people with type 2 diabetes.

The results of scientific research have shown that insufficient sleep is a risk factor for type 2 diabetes.

PROPOSAL

In the conditions of Afghanistan, I propose the following:

- I suggest that other studies be conducted on comparing type 2 diabetic patients and healthy groups, as well as investigating the relationship between self-efficacy and other important aspects of life in these patients.
- Based on the information of the Ministry of Public Health of Afghanistan, the use of unhealthy foods, lack of physical activity and weight gain are the main causes of diabetes. The ministry recommends that maintaining a normal weight, daily exercise, using low-fat foods and avoiding smoking are important to prevent this disease.
- Sleep and whole grain bread reduce the risk of diabetes. I recommend eating it for diabetic patients
- In order to prevent the risk of diabetes, we must prioritize regular and good sleep.
- "Regular exercise, eating healthy food and avoiding smoking are the key ways to fight diabetes.
- Exercise for 40 minutes daily and avoid fatty foods and smoking.
- Most of these diseases can be treated with regular physical movements, proper and healthy food and improving the environment, which I suggest.
- prevention
- There are different ways to prevent the formation of diabetic ulcers:
- Avoiding smoking, keeping glucose, blood pressure and cholesterol under control, exercising to stimulate blood flow, keeping feet

clean, checking feet every day for scratches and cracked skin, drying feet after bathing. I propose

- I recommend massage therapy in diabetes.
- Different massage styles can be effective in lowering blood sugar
- I suggest that specialized massages such as foot massage are effective on type 2 diabetes.
- Massaging different areas, including legs and abdomen, is also effective in reducing blood sugar.
- But it should be kept in mind that massage should be done carefully and with low pressure for diabetics.

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