

Sleeping Disturbance and its Associated Risk Factors Among Type 2 Diabetes Mellitus Patients Attending in a Tertiary Level Hospital in Dhaka City Bangladesh

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Abstract

Original Research Article

Objective: Poor sleep quality is an unreported and unrecognized problem which can affect the prognosis of diabetes patients. The aim of this study was to assess the prevalence of poor sleep quality and its associated factors among patients with diabetes mellitus in a tertiary care hospital in Dhaka. **Methods:** A hospital-based cross-sectional study was conducted among 343 diabetes mellitus patients at the Razarbagh Central Police Hospital from October 2021 to March 2022. A convenience sampling method was used to reach the study subjects. An interviewer-administered questionnaire was used for data collection. Pittsburgh sleep quality index was used for assessing sleep quality. **Result:** The overall prevalence of poor sleep quality was 81.85%. Multivariable analysis of the factors found that married person (AOR: 6.10, 95% CI: 1.03-35.93, p= 0.04), alcohol consumption (AOR: 12.11, 95% CI: 1.39-65.53, p= 0.02), no physical exercise (AOR: 11.99, 95% CI: 1.26-78.93, p= 0.03), HbA1c (AOR: 3.48, 95% CI: 1.21-21.71, p= 0.01) and low HDL (AOR: 18.60, 95% CI: 6.73-94.56, p= 0.04) were significantly associated with poor sleep. **Conclusion:** In this study, more than 80% patients had poor sleep quality. Drinking alcohol, smoking type 2 diabetes mellitus, and poor glycemic control were factors in poor sleep quality.

Keywords: Sleeping disturbance, diabetes mellitus, smoking, alcohol consumption, poor glycemic control.

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INTRODUCTION

Sleep is a fundamental biological process that is absolutely necessary for maintaining life [1]. A state of unconsciousness from which a person may be woken by sensory or other stimuli is the definition of this condition [2]. It is at this period that the body secretes a large number of essential hormones, which influence the processes of development, sleep, energy regulation, metabolic function, and endocrine function [3, 4]. To maintain a healthy body, one of the most essential things we need is to get sufficient amounts of restful sleep of a high enough quality to satisfy our physiological needs in terms of length, timing, and consistency, in addition to the absence of sleep disorders [5].

People who have diabetes mellitus are at a larger risk than the general population of having symptoms of sleep disruption. These symptoms might be connected with the diabetes itself or with the problems that arise as the illness develops [6]. The metabolic disorder known as diabetes mellitus (DM) has been linked to irregular sleeping habits [7-10]. Over the course of the last several decades, the scale of sleep disruptions and deprivation has been significantly rising all over the globe [11]. This trend has occurred concurrently with the global rise in the prevalence of diabetes and obesity. The findings of many research suggest that the incidence of sleep disturbances among persons who have type 2DM varies from 38 to 97%. This results in an increased load on caregivers and a decrease in Quality of life for patients [10-13].

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Inadequate sleep has been linked to a wide variety of detrimental health effects as well as an increased chance of death. It has a negative impact on cognitive function and has a significant negative impact on workplace productivity because of absenteeism [14]. People who have type 2 diabetes have a greater chance of having poor sleep quality, according to the results of a number of research. These factors include being female, having a low income, having a longer duration of the illness, having poor glycemic control, and having hypertension [11, 12, 15].

MATERIAL & METHODS

A cross sectional study was conducted between 25-65 years of patients who have type 2 diabetes mellitus. The data was collected from the outpatient department of Central Police Hospital Rajarbagh, Dhaka. The study was conducted among 343 patients for 6 months duration from October 2021 to March 2022. Respondents were selected by convenience sampling.

Questionnaires were used to examine participants' socio-demographics, clinical and biochemical indicators, and HbA1C levels. The level of HbA1C less than or equal to 6.5% is considered good glycemic control, while a level of HbA1c greater than 6.5% is considered poor glycaemic control. The "poor sleep quality group," (PSQI) questionnaire assesses the quality of sleep, sleep efficiency, sleeping length, sleeping hours efficiency, sleep disruption, use of sleep medicine, and day dysfunction.

Following the gathering of data, it was examined and verified for consistency and error minimization. Following that, the information will be transferred to an appropriate master sheet for processing and analysis. Data was entered into a computer and

saved in STATA 16 program. The collected data's quality and reliability will be double-checked. Frequency tables were used to summarize categorical variables. Chi-square test was used to compare the proportions of categorical variables. A multivariable logistic regression model was carried out to find out the factors associated poor sleep quality. A P value < 0.05 was considered statistically significant.

Inclusion Criteria

- Diagnosed with T2DM for more than 3 years; medical records will be used to confirm this.
- Must be 25 years age or over

Exclusion Criteria

- Gestational diabetes (GDM)
- Severe heart diseases
- Lung diseases
- Cerebral disease and other mental disorders

RESULT

Sociodemographic characteristics:

Table 1: Distribution of the respondents by age (n=343)

Age (years)	Percentage (%)
≥ 50	63.27
<50	36.73

Table 1 above shows, majority of the respondents belonged to age group ≥ 50 years (63.27%) while only 36.73% of them belonged to age group <50 years.

Majority of the respondents (69.10%) were male and 30.90% were female.

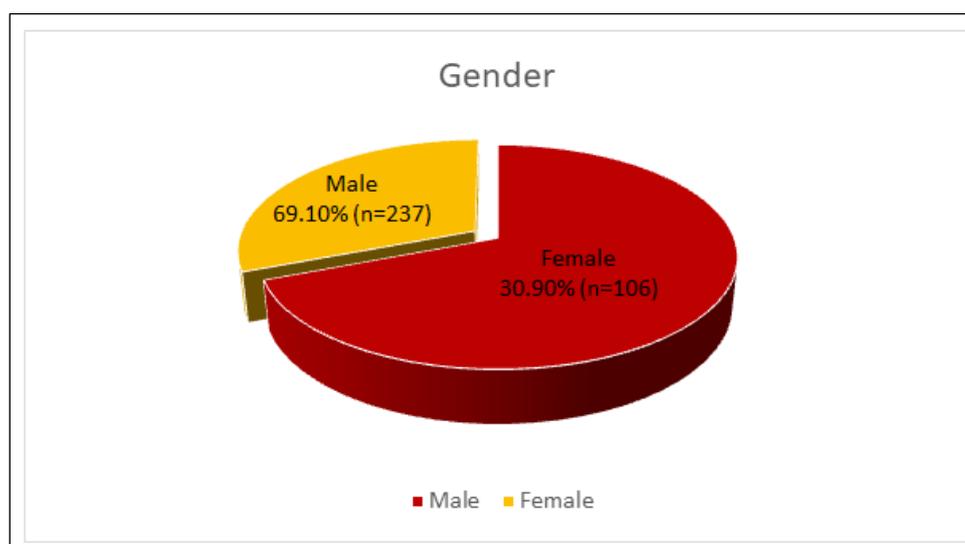


Figure 1: Distribution of the respondents by gender (n=343)

Table 2: Association of the Socio-Demographic Factors with the Quality of Sleep (n=343)

Socio-Demographic Factors	Good Sleep	Poor Sleep	P-value
	n (%)	n (%)	
Age Group (Years)			
<50	20 (15.87)	106 (84.13)	0.40
≥50	41 (19.52)	169 (80.48)	
Gender			
Male	42 (18.10)	190 (81.90)	0.97
Female	19 (18.27)	85 (81.73)	
Marital Status			
Single	17 (32.69)	35 (67.31)	<0.01*
Married	44 (15.49)	240 (84.51)	
Number of Family Members			
≤4	29 (20.14)	115 (79.86)	0.41
>4	32 (16.67)	160 (83.33)	
Education			
No formal education	04 (15.38)	22 (84.62)	0.02*
SSC/HSC	39 (15.54)	212 (84.46)	
Graduation or above	18 (30.51)	41 (69.49)	
Family Income (taka)			
<50000	19 (15.97)	100 (84.03)	0.44
≥50000	42 (19.35)	175 (80.65)	
Smoking			
Yes	05 (8.47)	54 (91.53)	0.03*
No	56 (20.22)	221 (79.78)	
Alcohol Consumption			
Yes	11 (33.33)	22 (66.67)	0.01*
No	50 (16.50)	253 (83.50)	
Physical Exercise			
Yes	12 (29.27)	29 (70.73)	0.04*
No	49 (16.61)	246 (83.39)	
Hypertension			
Yes	27 (18.12)	122 (81.88)	0.98
No	34 (18.18)	153 (81.82)	
BMI			
Normal weight	26 (18.31)	116 (81.69)	0.74
Overweight	24 (16.78)	119 (83.22)	
Obese	11 (21.57)	40 (78.43)	

*P-value <0.05 is significant

Table 1 above shows, the association of the socio-demographic factors with the quality of sleep. Marital status ($p<0.01$), education ($p=0.02$), smoking ($p=0.03$), alcohol consumption ($p=0.01$) and physical

exercise ($p=0.04$) were significantly associated with the quality of sleep.

Clinical characteristics:

Table 2 shows, almost 45% of the participants had Hypertension.

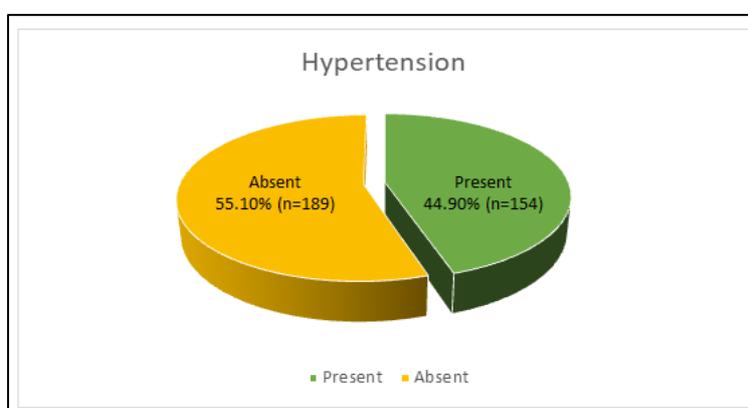
**Figure 2: Distribution of respondents by Hypertension (n=343)**

Table 3 demonstrates, among all the participants, 42.57% were overweight and 14.87% were obese.

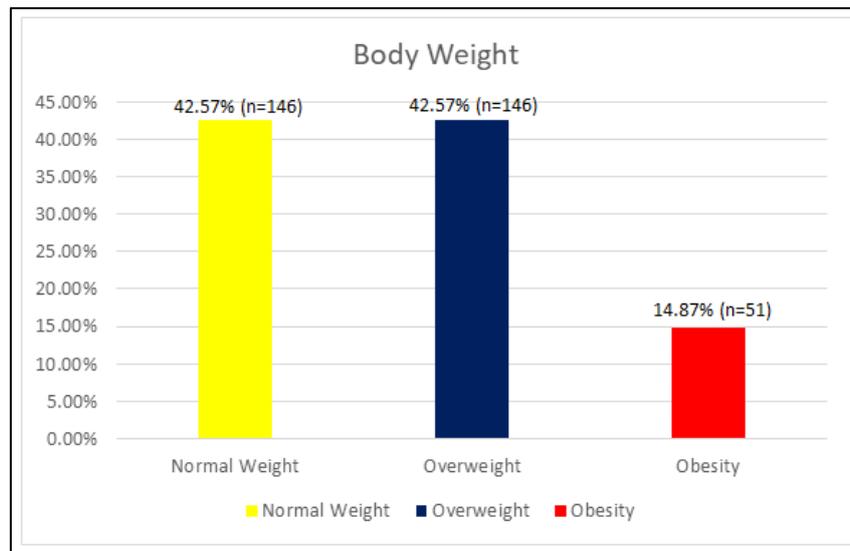


Figure 3: Distribution of respondents by BMI (n=343)

Figure 4 illustrates, nearly 82% of the diabetic patients had poor sleep quality in this study.

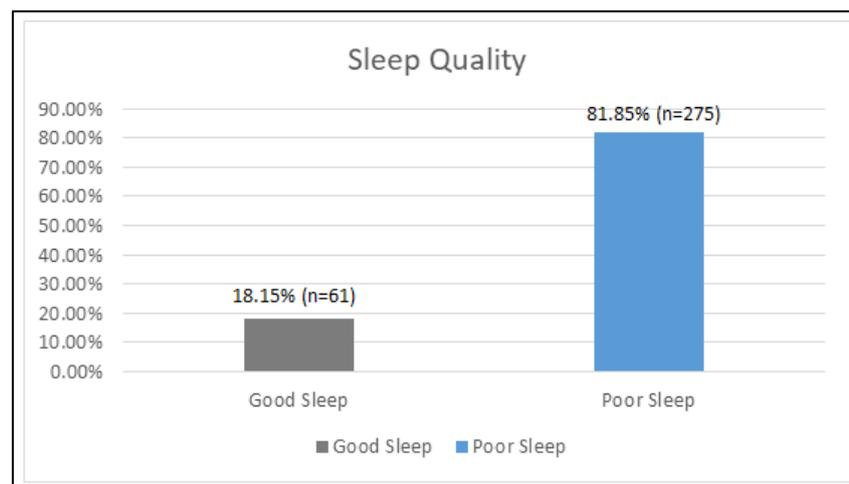


Figure 4: Distribution of respondents by Sleep Quality (n=343)

Table 3: Association of the Laboratory Investigations with the Quality of Sleep

Laboratory Investigations	Good Sleep	Poor Sleep	P-value
	n (%)	n (%)	
HbA1c			
<6.5	15 (33.33)	30 (66.67)	<0.01*
≥6.5	44 (15.33)	243 (84.67)	
Triglyceride			
Normal	07 (19.44)	29 (80.56)	0.75
High	25 (17.24)	120 (82.76)	
Total Cholesterol			
Normal	21 (17.80)	97 (82.20)	0.95
High	11 (17.46)	52 (82.54)	
HDL			
Normal	29 (20.14)	115 (79.86)	0.04*
Low	03 (6.98)	40 (93.02)	
LDL			
Normal	10 (18.52)	44 (81.48)	

Laboratory Investigations	Good Sleep	Poor Sleep	P-value
	n (%)	n (%)	
High	21 (16.94)	103 (83.06)	0.79
Serum Creatinine			
Normal	48 (18.75)	208 (81.25)	0.13
High	06 (10.53)	51 (89.47)	
SGPT			
Normal	31 (13.78)	194 (86.22)	0.66
High	05 (16.67)	25 (83.33)	
Uric Acid			
Normal	19 (18.27)	85 (81.73)	0.03*
High	02 (4.88)	39 (95.12)	

Table 3 above shows HbA1c ($p<0.01$), HDL ($p=0.04$) and Uric Acid ($p=0.03$) were significantly associated with the quality of sleep.

DISCUSSION

The results of this research showed that people with type 2 diabetes had a much higher prevalence of poor sleep quality (81.85%). The findings of research carried out in Turkey (77.4%), Saudi Arabia (72%), the United States (84%) and Sudan (97.1%) are consistent with this conclusion [12, 13, 16, 17].

The present study did not find any evidence of an age-related increase in the prevalence of sleep disorders among diabetics. According to previous studies, the patient's age is a contributing factor to their poor sleep [18-20]. The variation is probably because the research population varied in terms of health and illness. While the present study did not find a statistically significant correlation between education and sleep quality, two of the previous studies observed a link between education and sleep duration, sleep efficacy, and the dosage of sleep medication [18, 19].

In addition, it correlates strongly with exercise, but not with other demographic variables such as age, education level, or household income. Other studies discovered a strong correlation between sleep problems and a variety of demographic and lifestyle characteristics in people with diabetes, including marital status, occupation, age, sex, and level of physical activity. Some of these characteristics, including exercise frequency, insulin usage, length of illness, age, and gender, were investigated by previous studies as possible predictors of the prevalence of sleep disorders [20-23].

However, it was a cross sectional study with the relatively limited sample size. In addition, the findings of this study could be associated with information and selection bias. Due to limitation of resources and lack of financial support data collection might not be appropriate.

CONCLUSION

Poor sleep quality may be improved by early management services, which may include health education. These services are often included in the normal care of diabetes mellitus. Patients who consume alcohol, use cigarettes, have comorbid conditions, or exhibit signs of depression need specialized instruction as well.

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