RESEARCH PAPER

Sleep Quality among Type 2 Diabetes Patients with Controlled and Uncontrolled blood sugar: A Comparative Study

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ABSTRACT

The objectives were to describe the quality of sleep among patients with type 2 diabetes with controlled and uncontrolled blood sugar, to correlate sleep quality with blood sugar and to find associations with background factors. A descriptive correlational comparative design with purposive sampling (N=200) was adopted from Government Headquarters Hospital, Erode district. Data were collected using a Pittsburgh Sleep Quality Index. Results revealed a low positive correlation between global sleep quality and fasting blood sugar in the controlled group. Marital status (controlled group) and frequent urination (uncontrolled group) showed significant associations with sleep quality ($p<0.05$). Hence, routine sleep assessment is recommended for glycaemic management in type 2 diabetes.

Keywords: Sleep quality, Type 2 diabetes mellitus, Controlled blood sugar, Uncontrolled blood sugar.

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INTRODUCTION

Sleep Quality among Type 2 Diabetes Patients with Controlled and Uncontrolled blood sugar: A Comparative Study

Sleep quality is a critical determinant of metabolic health, particularly in patients with type 2 diabetes mellitus (T2DM). Poor sleep can impair glucose metabolism, increase insulin resistance, and contribute to poor glycaemic control. Approximately one in two people with T2DM experiences sleep problems due to unstable blood sugar levels and accompanying diabetes-related symptoms such as nocturia, hyperglycaemia, and hypoglycaemia during the night, which can lead to insomnia and next-day fatigue [1]. Moreover, as with many chronic conditions, depression or stress about the disease may also keep the afflicted person awake at night [2].

Type 2 diabetes is a chronic metabolic disorder characterized by hyperglycaemia resulting from insulin resistance and relative insulin deficiency. Globally, in 1990, 200 million people had diabetes, and by 2022, the number increased to 830 million [2]. Compared to high-income countries, the prevalence has been increasing more quickly in low- and middle-income countries [1]. Among the various factors influencing blood sugar control, sleep quality has emerged as an important but often underestimated variable. Recent evidence suggests that patients with poor sleep quality have significantly worse glycaemic control, as measured by HbA1c (8.7 ± 1.9 vs. 7.2 ± 1.2; $p < 0.01$), and more frequent diabetes-related complications compared to those with adequate sleep quality [3].

Despite growing evidence linking sleep disturbances to poor glycaemic outcomes, limited research has specifically compared sleep quality between controlled and uncontrolled type 2 diabetic patients and examined its association with background factors such as demographics and environmental symptoms. Therefore, the present study was undertaken to describe sleep quality, correlate it with blood sugar levels, and identify associations with background factors among type 2 diabetic patients with controlled and uncontrolled blood sugar.

OBJECTIVES

- To describe the quality of sleep among type 2 diabetes patients with controlled and uncontrolled blood sugar in OPD at Erode government hospital.
- To correlate the quality of sleep and blood sugar among controlled and uncontrolled type 2 diabetic patients in OPD at Erode government hospital.
- To find the association between quality of sleep and back ground factors like age, gender, marital status, nature of work, education, duration of diabetes , body mass index, regularity of checking blood glucose among type 2 diabetes patients with controlled and uncontrolled blood sugar in OPD at Erode government hospital.

RESEARCH HYPOTHESES

RH1 – There will be a significant difference in quality of sleep among type 2 diabetic patients with controlled and uncontrolled blood sugar.

RH2 – There will be a significant correlation between quality of sleep and blood sugar among type 2 diabetic patients with controlled and uncontrolled blood sugar.

RH3 – There will be a significant association between quality of sleep and background factors among type 2 diabetic patients with controlled and uncontrolled blood sugar.

MATERIALS AND METHODS

Approach: Quantitative research approach.

Design: Correlational comparative design.

Study variable: Quality of sleep and blood sugar levels.

Background variables: Age, gender, marital status, residency, type of family, income, education, occupation, duration of diabetes, medication adherence, environmental factors (frequent urination, thirst, etc.).

Setting: The study was conducted at Government Headquarters Hospital, Erode district.

Tools: Quality of sleep was measured by using Pittsburgh Sleep Quality Index (1989) ; blood sugar levels measured via fasting blood glucose

Sample: Around 200 type 2 diabetic patients who met the inclusion criteria were selected as samples by purposive sampling technique.

Sampling Technique: Non-probability purposive sampling technique was used to select the samples for the present study.

Criteria for sample selection:

Inclusion Criteria

- Who were diagnosed to have type 2 diabetes mellitus for at least 2 years.
- Who were attending to the OPD at Government hospital, Erode
- Aged between 40 and 60 years.
- Both males and females
- Who were willing to participate in the study

Exclusion Criteria

- Who developed any diabetic complications
- Who were with other systemic disease conditions
- Who were with mental or neurological problems

VALIDITY OF THE TOOL / ETHICAL CONSIDERATION

The validity of the tool was judged by 2 medical experts and 3 nursing experts from other hospitals and nursing colleges. The opinions and suggestions on the applicability of the content were modified and finalized. The correlation coefficient for quality of sleep and blood sugar was r = 0.95, indicating high reliability.

Ethical clearance was obtained from the Institutional Ethics Committee. Permission was obtained from the Medical Superintendent, Government Headquarters Hospital, Erode district. Informed written consent was obtained from each participant after explaining the purpose and procedure of the study. Confidentiality of the data was assured and maintained throughout the study. Participants were informed of their right to withdraw at any time without any consequences.

DATA COLLECTION PROCEDURE

Permission was obtained from the concerned authorities at Government Headquarters Hospital, Erode district. Data collection was done among 200 type 2 diabetic patients attending the outpatient department and inpatient wards. Approximately 20–25 minutes were spent to elicit data from each participant. On the first day, demographic variables, background factors, and quality of sleep were assessed by a structured interview questionnaire prepared by the investigator. Fasting blood sugar levels were recorded from the patients' medical records or measured using a glucometer. Confidentiality was maintained throughout the procedure. Data were analyzed by using descriptive and inferential statistics (SPSS version 20).

RESULTS

SECTION – I: DATA ON BACKGROUND FACTORS AMONG TYPE 2 DIABETIC PATIENTS WITH CONTROLLED AND UNCONTROLLED BLOOD SUGAR.

TABLE-1-Frequency, percentage and $\chi 2$ distribution regarding background factors of type 2 diabetic patients with controlled and uncontrolled blood sugar.

Background factors	Type 2 diabetes				$\chi 2$
	Controlled blood sugar (n = 100)		Uncontrolled blood sugar (n = 100)		
	No	%	No	%	
Age					
a) 31- 40 yrs	4	4	9	9	2.133
b) 41 – 50 yrs	33	33	31	31	(P=0.545
c) 51 – 60 yrs	31	31	31	31	)
d) 61 – 70 yrs	32	32	29	29	NS
Gender					1.426
a) Male	30	30	38	38	(P=0.232
b) Female	70	70	62	62	)
					NS
Marital Status	2	2	2	2	0.80
a) Single	76	76	81	81	(P=0.670
b) Married	-	-	-	-	)
c) Divorced	22	22	17	17	NS
d) Widow	-	-	-	-	
e) Widower					
Education					0.00
a) Literate	49	49	49	49	(p=1.00)
b) Illiterate	51	51	51	51	NS
Body mass index	5	5	8	8	**5.927**
a)	70	70	80	80	**(p=0.052**
Malnourished	25	25	12	12	**)**
b) Normal					**S**
c) Obese					
Environmental factors	3	3	0	0	
a) New	6	6	0	0	**17.173**
environment	27	27	15	15	**P(0.004)**
b) Noise	3	3	7	7	**S**
c) Presence of	43	43	61	61	
mosquitoes	18	18	17	17	
d) Night shift work					
e) Frequent urination					
f) None					

S: Significant **N.S:** Non-Significant

Table 1 reveals the background factors among type 2 diabetic patients with controlled and uncontrolled blood

sugar. Regarding age, majority of controlled group 33(33%) were in 41-50 years and uncontrolled group 31(31%) were in 51-60 years. The obtained χ^2 value 2.133 (p=0.545) was not significant. Regarding gender, majority in both groups were females (70% and 62%). Regarding marital status, majority were married (76% and 81%). Regarding education, 51% in both groups were illiterate. Regarding BMI, the obtained χ^2 value 5.927 (p=0.052) was significant. Regarding environmental factors, majority of uncontrolled group 61(61%) reported frequent urination, and the obtained χ^2 value 17.173 (p=0.004) was significant. It was inferred that both groups were comparable.

Figure 3, shows the frequency and percentage distribution of controlled and uncontrolled type 2 diabetic patients according to nature of work.

Majority of type 2 diabetic patients with controlled blood sugar 49(49%) were not working (house wife) and least 8(8%) were heavy workers. Majority of type 2 diabetic patients with uncontrolled 38(38%) were not working (house wife) .and least 11(11%) were a heavy worker. The obtained $\chi 2$ value 4.446 (P=0.217) was not significant. Therefore, the group was comparable with regard to nature of work.

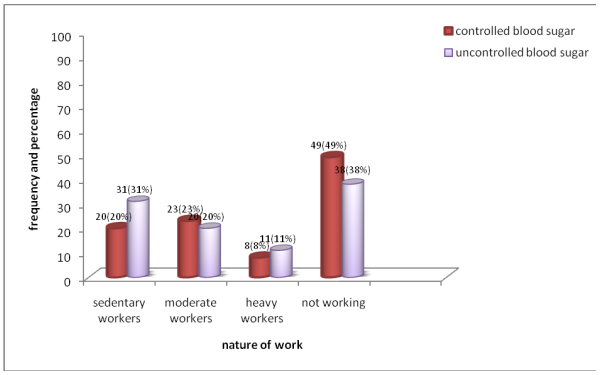

Fig. 3: Frequency and percentage distribution of type 2 diabetic patients according to nature of work

Figure 4, shows frequency and percentage distribution of controlled and uncontrolled type 2 diabetic patients according to duration of type 2 diabetes.

Regarding **duration of type 2 diabetes,** majority of type 2 diabetic patients with controlled blood sugar 83(83%) were suffering from diabetes for two years and more and least17 (17%) was less than two year. Majority of type 2 diabetic patients with uncontrolled 75(75%) were having diabetes two years and more and least 25(25%) was less than two year. The obtained $\chi 2$ value 1.929 (p=0.165) was not significant. Therefore, the group was comparable with regard to duration of type 2 diabetes.

It was inferred that majority of type 2 diabetic patients suffering from diabetes for two years and more in controlled blood sugar group than the uncontrolled blood sugar.

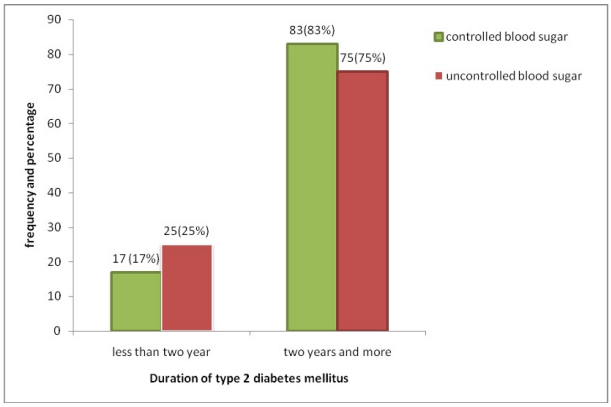

Fig. 4: Frequency and percentage distribution of type 2 diabetic patients according to duration of type 2 diabetes

SECTION – II: DATA ON QUALITY OF SLEEP AMONG TYPE 2 DIABETIC PATIENTS WITH CONTROLLED AND UNCONTROLLED BLOOD SUGAR

For the purpose of the study, the following null hypothesis was stated.

H01 – There will be no significant difference in Quality of sleep between type 2 diabetic patients with controlled and uncontrolled blood sugar.

TABLE – 2 Mean, S.D, mean difference and 't' value between sleep pattern and type 2 diabetes with controlled and uncontrolled blood sugar.

Sleep Pattern	Type 2 Diabetes		Mean Difference	't' value
	Controlled Blood Sugar (N=100)	Uncontrolled Blood Sugar (N=100)		

	Mean time (mts)	S.D	Mean time (mts)	S.D		
1. Bed time	9.93	1.133	10.04	0.800	-0.113	-0.815 (p=0.416) NS
2. Fall asleep	33.25	27.093	40.70	32.837	-7.450	-1.750 (p=0.082) NS
3. Get up	5.32	0.984	5.40	0.926	-0.079	-0.588 (p=0.557) NS
4. Hours sleep	5.14	1.400	4.03	1.210	1.110	**5.999 (p=0.01) S**
5. Global sleep index	7.72	3.499	10.62	3.606	-2.900	**-5.771 (P=0.01) S**

S: Significant **N.S**: Non-Significant

Table - 2 reveals the Mean, S.D, mean difference and 't' value between sleep pattern and type 2 diabetes with controlled and uncontrolled blood sugar.

There was significant difference in the hours of sleep between the controlled and uncontrolled type 2 diabetic patients t=5.99($p<0.01$) and the global sleep index. t = -5.77 ($p < 0.01$). Therefore the null hypothesis was rejected. It was inferred that type 2 diabetic patients with controlled blood sugar slept significantly more and had less disturbance in sleep (global sleep index).

TABLE – 3: Frequency, percentage and χ^2 distribution regarding quality of sleep among type 2 diabetic patients with controlled and uncontrolled blood sugar.

Quality of sleep	Type 2 diabetes				χ^2
	Controlled blood sugar (n = 100)		Uncontrolled blood sugar (n = 100)		
	No	%	No	%	
1.Subjective sleep quality					
a. Very good	24	24	14	14	
b. Fairly good	28	28	15	15	**17.097 (p=0.001) S**
c. Fairly bad	36	36	37	37	
d. Very bad	12	12	34	34	
2. Sleep latency					
a. ≤ 15 minutes	31	31	26	26	6.978 (p=0.073) NS
b. 16 – 30 minutes	50	50	41	41	
c. 31 – 60 minutes	17	17	24	24	
d. > 60 minutes	2	2	9	9	
3. Sleep duration					
a. >7 hours	4	4	1	1	**38.850 (p=0.001) S**
b. 6-7 hours	20	20	1	1	
c. 5-6 hours	43	43	25	25	
d. <5 hours	33	33	73	73	
4. Sleep efficiency					
a. > 85%	25	25	10	10	**27.223 (p=0.001) S**
b. 75-84%	22	22	6	6	
c. 65-74%	15	15	11	11	
d. <65%	38	38	73	73	
5. Sleep disturbance					
a. Not during the past month	14	14	9	9	**17.475 (p=0.001) S**
b. Less than once a week	77	77	58	58	
c. Once or twice a week	9	9	33	33	

Quality of sleep	Type 2 diabetes				χ^2
	Controlled blood sugar (n = 100)		Uncontrolled blood sugar (n = 100)		
	No	%	No	%	
6. Day time dysfunction	45	45	30	30	7.340
a. Not during the past month	38	38	39	39	(p=0.062
b. Less than once a week	9	9	14	14	)
c. Once or twice a week	8	8	17	17	NS
d. Three or more times a week					

Table: 3 reveals the Frequency, percentage and $\chi 2$ distributions regarding quality of sleep among type 2 diabetic patients with controlled and uncontrolled blood sugar. Regarding subjective **sleep quality**, more number of type 2 diabetic patients with controlled blood sugar reported very good(24%) and fairly good (28%) than the type 2 diabetes patients with uncontrolled blood sugar (14%) and (15%) respectively. The obtained $\chi 2$=17.097 ($p<0.001$) was highly significant. Therefore, there was a significant association between good quality of sleep and controlled blood sugar among type 2 diabetes patients. Regarding **sleep latency,** the more number of type 2 diabetic patients with controlled(50%) and uncontrolled blood sugar(41%) were reported that time taken to fall asleep was 15 – 30 minutes . the obtained $\chi 2$ = 6.978 ($p>0.01$) was not significant. Therefore, there was no significant association between sleep latency and controlled blood sugar among type 2 diabetes patients. Regarding **sleep duration**, the more number of type 2 diabetic patients with controlled blood sugar (43%) were slept 5 – 6 hours per night, whereas uncontrolled blood sugar (73%) were slept <5 hours per night .The obtained $\chi 2$= 38.850 ($p<0.01$) was highly significant. Therefore there was a significant association between sleep duration and uncontrolled blood sugar among type 2 diabetes patients. Regarding **sleep efficiency**, the more number of type 2 diabetic patients with uncontrolled blood sugar (73%)were reported <65% of total time taken to sleep in bed than the type 2 diabetic patients with controlled blood sugar .The obtained $\chi 2$=27.223 ($p<0.01$) was highly significant. Therefore, there was a significant association between sleep efficiency and uncontrolled blood sugar among type 2 diabetes patients. Regarding **sleep disturbance**, the more number of type 2 diabetic patients with controlled blood sugar(77%) reported that sleep disturbance were present less than once a week than the type 2 diabetic patients with uncontrolled blood sugar(58%). The obtained $\chi 2$= 17.475 ($p<0.01$) was highly significant. Therefore, there was a significant association between the sleep disturbance and controlled blood sugar among type 2 diabetic patients. Regarding **day time dysfunction**, the more number of type 2 diabetic patients with controlled blood sugar (45%) reported that day time dysfunction were not during the past month than the type 2 diabetic patients with uncontrolled blood sugar(39%). The obtained $\chi 2$=7.340 ($p>0.01$) was not significant.

SECTION – III: DATA ON THE CORRELATION BETWEEN QUALITY OF SLEEP AND THE BLOOD GLUCOSE AMONG CONTROLLED AND UNCONTROLLED TYPE 2 DIABETIC PATIENTS.

For the purpose of the study, the following null hypotheses were stated.

H_{02} - There will be no significant correlation between the quality of sleep and fasting blood sugar among controlled and uncontrolled type 2 diabetic patients.

H_{03} - There will be no significant correlation between the quality of sleep and post prandial blood sugar among controlled and uncontrolled type 2 diabetic patients.

TABLE – 4 Mean, S.D, and 'r' value on quality of sleep and fasting blood sugar among controlled and uncontrolled type 2 diabetic patients.

Group	Type – 2 Diabetic Patients	
	Controlled Blood Sugar (N=100)	Uncontrolled Blood Sugar (N=100)
Mean fasting blood sugar	**91.92 mg/dl**	**162.48 mg/dl**

Quality of sleep	Mean	S.D	'r'	Mean	S.D	'r'
Global	7.72	3.499	**0.224 (P=0.025) S**	10.62	3.606	0.103 (p=0.306) NS

S: Significant N.S: Non-Significant

Table 4 reveal the correlation between the quality of sleep and fasting blood sugar among controlled and uncontrolled type 2 diabetic patients. There was a low significant positive correlation between the global quality of sleep and fasting blood sugar among type 2 diabetic patients with controlled blood sugar r=0.224 (p=0.025). Also there was no correlation between uncontrolled blood sugar and global quality of sleep among type 2 diabetic patients (p>0.05). It was inferred that there was significant positive correlation between the global quality of sleep and controlled blood sugar among type 2 diabetic patients.

TABLE - 5 : Mean, S.D, and 'r' value on quality of sleep and post prandial blood sugar among controlled and uncontrolled type 2 diabetic patients.

Group	Type – 2 Diabetic Patients					
	Controlled Blood Sugar (N=100)			Uncontrolled Blood Sugar (N=100)		
Mean post prandial blood sugar	143.22 mg/dl			287.84 mg/dl		
Quality of sleep	Mean	S.D	'r'	Mean	S.D	'r'
Global	7.72	3.499	0.084 (P=0.409) NS	10.62	3.606	0.153 (p=0.127) NS

S: Significant N.S: Non-Significant

Table 5 reveal the correlation between the quality of sleep and post prandial blood sugar among controlled and uncontrolled type 2 diabetic patients. There was no correlation between post prondial blood sugar and global sleep quality among controlled and uncontrolled type 2 diabetic patients (p>0.05).

SECTION – IV: DATA ON ASSOCIATION BETWEEN QUALITY OF SLLEP AND BACKGROUND FACTORS AMONG TYPE 2 DIABETIC PATIENTS WITH CONTROLLED AND UNCONTROLLED BLOOD SUGAR.

For the purpose of the study, the following null hypotheses were stated.

H_{04} : There will be no significant association between quality of sleep and background factors in type 2 diabetic patients with controlled and uncontrolled blood sugar.

TABLE – 6: Linear regressions regarding the association between the global quality of sleep and background factors in type 2 diabetic patients with controlled and uncontrolled blood sugar.

Background Factors	Type 2 Diabetic Patients					
	Controlled Blood Glucose (N=100)			Uncontrolled Blood Glucose (N=100)		
	Standar-dised co-efficient (β)	't' value	Significance (p<0.05)	Standar-dised co-efficient (β)	't' value	Significance (p<0.05)
1. Age	-0.46	-0.520	0.604 (NS)	-0.035	-0.356	0.723 (NS)
2. Gender	0.008	0.078	0.938 (NS)	0.159	1.498	0.138 (NS)
3. Marital status	0.223	2.263	**0.026 (S)**	-0.18	-0.174	0.862 (NS)
4. Nature of work	-0.015	-0.145	0.885 (NS)	0.129	1.167	0.246 (NS)
5. Education	-0.057	-0.53	0.595 (NS)	0.167	1.595	0.114 (NS)

		4				
6. Duration of diabetes	0.005	0.057	0.955 (NS)	-0.054	-0.547	0.586 (NS)
7. Body mass index	0.105	1.189	0.237 (NS)	-0.072	-0.818	0.416 (NS)
8. Environmental factors	0.547	6.259	**0.001 (S)**	0.367	4.005	**0.001 (S)**
9. Test blood glucose	0.149	1.649	0.103 (NS)	0.039	0.398	0.692 (NS)

S: Significant N.S: Non-Significant

Table 6 reveals the standardized co-efficient (β) and 't' value regarding the global quality of sleep and background factors in type 2 diabetic patients with controlled and uncontrolled blood sugar based on linear regression . There was a significant association between the Marital status t=2.263 (p=0.026**),** Environmental factors t=6.259 (p<0.001) and the global quality of sleep among type 2 diabetic patients with controlled blood sugar. However , background factors such as age, Gender, Nature of work, education, duration of diabetes, body mass index, and regularity of checking blood sugar had no association with global quality of sleep among type 2 diabetic patients with controlled blood sugar (p>0.05). Also Environmental factor was significantly associated with global quality of sleep t=4.005 (p=0.001) among uncontrolled type 2 diabetic patients. It was inferred therefore the quality of sleep among type 2 diabetic patients with controlled blood sugar was influenced by marital status and environmental factors.

DISCUSSION

Type 2 diabetic patients with controlled blood sugar significantly slept more than the type 2 diabetic patients with uncontrolled blood sugar t=5.99 (p<0.01). Above findings were supported by the study at **Boston University School of Medicine (2021)** found that people who slept less than six hours a night had blood sugar problems compared to those who got eight. This illustrates the cycle of sleep deprivation raising blood sugar, and unstable blood sugar in turn compromising quality sleep.

Type 2 diabetic patients with uncontrolled blood sugar group had significantly high global sleep index than the type 2 diabetic patients with controlled blood sugar t=-5.77(p<0.01). Above findings were supported by the study University of Chicago Medical Center (2021) found that "Poor sleep quality in people with diabetes was associated with worse control of their blood glucose levels,"

Type 2 diabetic patients with controlled blood sugar had significantly very good sleep quality than the type 2 diabetic patients with uncontrolled blood sugar $\chi 2=17.097$ (p<0.01). Above findings were not supported by the Ning Zhang, et al., (2022) The results showed that those who experienced restless sleep or insomnia had significantly worse markers of blood sugar control. The glucose levels of poor sleepers were 23 percent higher and their insulin levels were elevated by 48 percent. The researchers calculated that this meant poor sleepers were 82 percent more insulin resistant than those who slept soundly.

Type 2 diabetic patients with controlled blood sugar had significantly high sleep duration (5-6 hours) than the type 2 diabetic patients with uncontrolled blood sugar (< 5 hours), $\chi 2=38.850$ (p<0.01).Above findings were supported by the Diabetes Care Journals (2019), Short and long sleep durations increase the risk of developing diabetes, independent of confounding factors. Sleep duration may represent a novel risk factor for diabetes. Lou.P. (2022) reported that subjects had 6 or fewers hours of sleep. Darkish, et.al., (2021) reported that majority of type 2 diabetes had less than 6 hours sleep.

Type 2 diabetic patients with uncontrolled blood sugar had significantly less sleep efficiency (<65%) than the type 2 diabetic patients with controlled blood sugar group $\chi 2=27.223$ (p<0.01). Above findings were supported by Tung TH at Linkou Chang Gung et al., (2019),This study demonstrated that both poor sleep quality and less-efficient sleep are significantly correlated with worse glycaemic control in patients with type 2 diabetes.

Type 2 diabetic patients with controlled blood sugar had significantly less sleep disturbance than the uncontrolled blood sugar group $\chi 2=17.475$ (p<0.01). Above findings were supported by Van Harlingen (2011), Adult patients with long-standing type 2 diabetes mellitus have

disturbed subjective sleep quality and a higher risk for OSA compared with control participants. Subjective sleep disturbances are part of the complex syndrome of long-standing type2 diabetes.

There was a low significant positive correlation between the global quality of sleep and fasting blood sugar among type 2 diabetic patients with controlled fasting blood sugar r=0.224 (p=0.025). The above finding was supported by the studies of the American Association for the Advancement of Science. A study conducted between 1996 and 2003 determined that short-sleepers have a significantly higher risk of developing impaired fasting blood sugar than regular sleepers.

There was no correlation between the quality of sleep and post prandial blood sugar among controlled and uncontrolled type 2 diabetic patients (p>0.05). Marital status was significantly associated with global quality of sleep among type 2 diabetic patients with controlled blood sugar t=2.263 (p<0.01). Majority of type 2 diabetic patients were married 76(76%) in controlled blood sugar group as a influencing factor of quality of sleep. Selected factors such as age (t=-0.604) ; gender (t=0.078) ; nature of work (t=-0.145) ; education (t=-0.534) ; duration of diabetes (t=0.057) ; body mass index (t=1.189) ; test blood sugar (t=1.649) had no association with quality of sleep among type 2 diabetic patients (p>0.05) with controlled blood sugar.

Above findings was supported by the study of Pean luo, et al., (2022) found that poor sleep quality and short sleep duration were associated with an increased prevalence of diabetes in the Chinese population, independently of potential confounders such as age, obesity, family history of diabetes, alcohol consumption, smoking, physical activity and other diseases.

Environmental factor was significantly associated with global quality of sleep t=4.005 (p<0.001) among type 2 diabetic patients with uncontrolled blood sugar. Majority of type 2 diabetic patients with uncontrolled blood sugar group reported frequent urination 61(61%) as a disturbing factor of global quality of sleep. Selected factors such as age (t=-0.356) ; gender (t=1.498) ; marital status (t=-0.174) ; nature of work (t=1.167) ; education (t=1.595) ; duration of diabetes (t=-0.547) ; body mass index (t=-0.818) ; and test blood sugar (t=0.398) had no association with quality of sleep among type 2 diabetic patients (p>0.05)with uncontrolled blood sugar. The above findings were supported by a German study by Kohlhuber, et al.,., the results of this poor sleep quality reach far beyond the short-term consequences of reduced cognitive performance and general tiredness. Their study showed that the long-term consequences of repeated sleep loss due to environmental noise.

IMPLICATIONS

The finding of the study has following implications in nursing

- Type 2 diabetic patients can be encouraged to sleep before 10pm
- Type 2 diabetic patients can be encouraged to regular blood sugar check up
- Type 2 diabetic patients can be encouraged to avoid noise environment
- Night shifts may be avoided among the type 2 diabetic patients
- A better control of blood sugar is needed to prevent nocturia among type 2 diabetic patients.

RECOMMENDATIONS

- A similar study can be conducted with large group
- A similar study can be conducted as a case control study among hospitalized patients.
- A similar study can be conducted among type 2 diabetes using self administered schedule

CONCLUSION

The study concluded that type 2 diabetic patients with controlled blood sugar group slept significantly more and had fewer disturbances in sleep. Less sleep duration and low sleep efficiency (total time sleep in bed) were had a strong influence on poor sleep quality among type 2 diabetes with uncontrolled blood sugar group. Frequent urination and night shift as a disturbing factor of global sleep quality. So nurses have to encourage the diabetic patients to avoid night shifts and a better control of blood sugar is needed to prevent nocturia.

SOURCE OF SUPPORT : None

CONFLICT OF INTEREST: None

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