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The Relationship Between the Risk of Type 2 Diabetes and Insomnia Severity and Sleep Duration in Academicians

Akademisyenlerde Tip 2 Diyabet Riski ile Uykusuzluk Şiddeti ve Uyku Süresi Arasındaki İlişki

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ABSTRACT

Introduction: Academicians, who frequently spend long hours in front of computer screens, may have lifestyles and sleep habits that differ from those of other professional groups and could entail a higher risk of diabetes.
Aim: This study aimed to ascertain the association between insomnia severity, sleep duration among academicians, and the risk of type 2 diabetes.
Method: This cross-sectional study was conducted with 125 individuals working as academicians at a state university between January and March 2020. Data collection tools included a Survey form, the Finnish Diabetes Risk Score, and the Insomnia Severity Index. Data analysis involved percentages, means, standard deviations, Pearson correlation, and regression tests.
Results: Among the academicians, 23.2% were at moderate risk and 12.0% were at high risk of diabetes. Additionally, 39.2% were below the insomnia threshold. Significant positive correlations were found between the Finnish Diabetes Risk Score and variables such as Insomnia Severity Index, age, body mass index, waist circumference, and daily sleep hours; a significant negative correlation was noted with daily sleep hours ($p < 0.05$). Regression analysis revealed a significant negative relationship between daily sleep hours and type 2 diabetes Risk ($\beta = -1.25$, $p < 0.001$).
Conclusion: The results demonstrated a clear and significant link between the severity of sleep deprivation, sleep duration, and diabetes risk among academicians. Therefore, adopting preventive strategies that emphasize lifestyle changes, including adequate sleep, is crucial for preventing diabetes development among academicians.

Keywords: Insomnia; nursing; sleep; type 2 diabetes.

ÖZ

Giriş: Özellikle uzun saatler boyunca bilgisayar ekranı başında çalışan akademisyenlerin yaşam tarzları ve uyku alışkanlıkları, diğer meslek gruplarından farklı olabilir ve diyabet riski taşıyabilir.
Amaç: Bu çalışma, akademisyenler arasında uykusuzluk şiddeti, uyku süresi ve tip 2 diyabet riski arasındaki ilişkiyi belirlemeyi amaçlamaktadır.
Yöntem: Bu araştırma Ocak ile Mart 2020 tarihleri arasında bir devlet üniversitesinde akademisyen olarak görev yapan 125 kişi ile kesitsel nitelikte gerçekleştirildi. Veri toplamada Anket formu, Finlandiya Diyabet Risk Anketi ve Uykusuzluk Şiddeti İndeksi kullanıldı. Verilerin analizinde, yüzdelik, ortalama, standart sapma, pearson korelasyon ve regresyon testleri kullanıldı.
Bulgular: Akademisyenlerin, %23,2'si orta ve %12,0'ı yüksek derecede olmak üzere diyabet riski bulunmuştur. Ayrıca %39,2'si uykusuzluk alt eşiğindedir. Finlandiya Diyabet Risk Anketi değişkeni ile uykusuzluk şiddeti indeksi, yaş, beden kitle indeksi, bel çevresi ve günlük uyku saati değişkenleri ile pozitif yönde; günlük uyku saati ile negatif yönde anlamlı bir ilişki bulunmuştur ($p < 0,05$). Regresyon analizi, günlük uyku saatleri ile diyabet riski arasında anlamlı bir negatif ilişki olduğunu gösterdi ($\beta = -1,25$, $p < 0,001$).
Sonuç: Araştırma sonuçlarımıza göre akademisyenlerde uykusuzluğun şiddeti ve uyku süresi ile diyabet riski arasında açık ve anlamlı bir bağlantı bulunmaktadır. Bu nedenle, yeterli uyku da dahil olmak üzere yaşam tarzı değişikliklerini vurgulayan önleyici stratejilerin benimsenmesi, akademisyenler arasında diyabet gelişiminin önlenmesi açısından önemlidir.

Anahtar kelimeler: Hemşirelik; uyku; uykusuzluk; tip 2 diyabet

Introduction

Typically arising in adults due to insulin resistance or insufficient insulin production by the pancreas, Type 2 Diabetes (T2DM) comprises approximately 90% of diabetic cases (World Health Organization [WHO], 2023). Factors contributing to the increase in T2DM include the adoption of a modern lifestyle associated with urbanization, physical inactivity, unhealthy dietary habits, and excess weight (Türkiye Society of Endocrinology and Metabolism, 2022). Moreover, there is growing acknowledgment of the influence that sleep behaviors and sleep disorders have on glycemic control (Reutrakul & Van Cauter, 2018).

The best form of rest for the body is sleep. Multiple variables influence the quality and duration of sleep. In addition to individuals' physical environments, work conditions, mental states, and personal characteristics, factors such as illnesses, emotional states, lifestyle, dietary habits, age, gender, medication use, smoking, alcohol and caffeine consumption, and the level of physical activity can influence the need for sleep (Martinez-Rodriguez & Santamaria, 2005; Ardıç, 2018). Due to the association between insufficient sleep duration (less than seven hours) and various chronic diseases, attention deficits, and increased accident risks, adults are advised to sleep for no less than seven hours (Watson et al., 2015). According to the "National Sleep Epidemiology Study in the Adult Community," which mapped out Türkiye's sleep patterns, it is reported that 11% of the population sleeps less than six hours, 30% sleeps more than eight hours, and 13% struggle to fall asleep (Ardic et al., 2013). Research has shown both insufficient and excessive amounts of sleep as variables that increase the risk of developing T2DM (Gottlieb et al., 2005; Jackson, Redline, Kawachi & Hu, 2013; Shan et al., 2015; Lee et al., 2023). In a prospective meta-analysis conducted by Shan et al. (2015), involving almost 500,000 adult participants, the follow-up lengths varied from 2.5 to 16 years. Research revealed that people who sleep less than seven hours per day experience a significant 9% rise in the risk of developing T2DM for every hour decrease in their typical sleep length. Similarly, for individuals sleeping more than eight hours, there was an approximate 14% increase in T2DM for each hour increase in sleep duration (Shan et al., 2015).

In sleep disorders, increased sympathetic activity and cortisol levels, along with changes in the release of hormones regulating energy balance, lead to metabolic disturbances. Alterations in the secretion of leptin and ghrelin lead to an increase in food consumption. These alterations contribute to an increase in body weight, obesity and an elevated likelihood of developing T2DM (Kessler, Nedeltcheva, Imperial & Penev 2010; Stamatakis & Punjabi, 2010; Tan, Chapman, Cedernaes & Benedict, 2018). Furthermore, both poor sleep quality and excessive sleep adversely affect glucose metabolism. Tare et al. (2014) and Pyykkönen et al. (2014) found that both inadequate and excessive amounts of sleep are associated with an increased vulnerability to T2DM. A study conducted on 4,402 Japanese patients diagnosed with T2DM unveiled that approximately 39% of them had a nightly sleep duration of fewer than 6.5 hours (Ohkuma et al., 2014). A cross-sectional study done with participants from Taiwan revealed a positive link between prolonged sleep duration and heightened insulin resistance (Chang, Koo, Kao & Chiang, 2012), whereas another study conducted in rural areas of China linked shorter sleep duration with heightened insulin resistance (Liu et al., 2011). Multiple systematic reviews have emphasized the influence of both the duration and quality of sleep on the regulation of blood sugar levels in both individuals with diabetes and those without diabetes. Reduced sleep duration and quality have been linked to decreased insulin sensitivity, elevated levels of fasting plasma glucose, and increased levels of HbA1c (Lee, Yen & Chin, 2017; Azharuddin, Kapur, Adil, Ghosh & Sharma, 2020).

It is believed that more research and awareness are needed regarding the relationship between diabetes, a highly prevalent and chronically managed disease worldwide and in Türkiye, and sleep duration. In this context, the intense work pace of academics at universities, long working hours to contribute scientifically, night shifts, and challenging working conditions can lead to decreased sleep duration and impaired sleep quality. This scenario has the potential to influence the risk of developing T2DM. It is crucial to understand the correlation between insomnia severity, sleep duration among academics, and the risk of T2DM, both for comprehending the health challenges within this professional cohort and for offering novel perspectives in combating diabetes on a broader scale.

Aim

This study aimed to ascertain the association between insomnia severity, sleep duration among academics, and the risk of T2DM.

Research Questions

1. Is there a relationship between insomnia severity and T2DM risk among academics?

2. What is the effect of daily sleep hours on T2DM risk and insomnia severity in academics?

Method

Study Design

The design of the research is cross-sectional between January and March 2020.

Study Setting

The study was carried out with academics employed at a state university in Ankara.

Study Population and Sample

The inclusion criteria for the study were being actively employed at the researched state university and voluntarily agreeing to participate. The sample of the study was determined using an appropriate method from the types of non-probability sampling (Christensen, Johnson & Turner, 2015). The population of this study consisted of a total of 125 faculty members working at a state university in Ankara. The sample size of the study was calculated using the formula $n = N \times \sigma^2 \times Z^2 / (N-1) \times d^2$, derived from the standard deviation value of the Finnish Diabetes Risk Test (FINDRISC) score found in the study conducted by Makrilakis (2010) (Standard Deviation (SD) = 15.47), where the population is known (Makrilakis, Liatis, Grammatikou,

Perrea & Katsilambros, 2010). A confidence level of 95% and a deviation d = 0.6 were accepted (Karasar, 2005) and N = (1124 × $(2.4)^2$ × $(1.9616)^2$ / 548 × 0.62) = 107 was found for sample size. Considering the potential sample loss, an additional 15% of the sample size was aimed to be reached, and thus, 125 participants were included in the study (Martínez-Mesa, González-Chica, Bastos, Bonamigo & Duquia, 2014).

Data Collection Tools

The data collection tools were a Survey Form, the FINDRISC, and the Insomnia Severity Index.

Survey Form: A survey form consisting of questions was created by the researchers based on literature reviews to evaluate academics' gender, education level, overall health assessment, daily working hours, sleep durations, exercise habits, and the presence of chronic diseases (Makrilakis et al., 2010; Çevik et al., 2016).

Finnish Diabetes Risk Test: Originally formulated by Lindström et al. in 1987, its validity and reliability were scrutinized in 1992, with further validation and reliability studies conducted by Kutlu, Sayın and Koçak in 2016. Endorsed for implementation in the Turkish population, FINDRISC aids in the identification of individuals at heightened risk of T2DM through straightforward inquiries addressing pertinent risk factors (Türkiye Society of Endocrinology and Metabolism, 2022). An individual's ten-year diabetes risk can be predicted using the FINDRISC, which yields a total score. Risk stratifications delineate groups as low (< 7), moderate (7 - 14), moderate-high (15 - 20), and high (> 20), with a cumulative score of 15 or more indicative of elevated T2DM risk, warranting enrollment in preventive programs (Lindström et al., 2003).

Insomnia Severity Index (ISI): This index, originally developed by Morin in 1993 and later refined by Bastien et al. in 2001, consists of seven items rated on a five-point Likert scale from 0 to 4. The Turkish validation and reliability of the scale were established by Boysan, Güleç, Besiroglu and Kalafat in 2010. The scale scores have a range of 0 to 28. Scores between 0 and 7 indicate the absence of clinically significant insomnia, while ratings between 8 and 14 suggest subthreshold insomnia. Scores between 15 and 21 indicate clinical insomnia of moderate severity, while ratings between 22 and 28 indicate clinical insomnia of severe severity. In the study conducted by Boysan et al., the internal consistency coefficient of the scale was found to be 0.79. In this study, the Cronbach's alpha value was determined to be 0.85 (Morin, 1993; Bastien, Vallières & Morin, 2001; Boysan, Güleç, Besiroglu & Kalafat, 2010).

Ethical Considerations

Before commencing the study, ethical approval was obtained from the Ethics Committee at Ankara Yıldırım Beyazıt University (Date: 22.11.2019 and No: 2019-511). Written consent was obtained from the participating volunteer academics after providing them with information about the research prior to the survey questions. Permission to use the scales in the research was obtained via email from the authors who developed the scales. The research adhered to the principles outlined in the Declaration of Helsinki.

Data Collection

After receiving ethical approval from the ethics committee, the researchers obtained the study data by conducting face-to-face interviews. The researchers took great care to conduct all interviews in tranquil and secure settings, thereby ensuring the participants' comfort. We collected the data between January and March 2020. The researchers conducted face-to-face interviews with the participants who willingly volunteered for the research. Each interview lasted between 20 and 25 minutes.

Data Analysis

Data analysis was conducted using Statistical Package for the Social Sciences Version 22.0 (IBM Corp., Armonk, NY, USA) and R-Project (R Core Team, 2023). The Shapiro-Wilk test was employed to assess the normality of the variables, guiding the selection of appropriate parametric tests. The Levene test was employed to assess the equality of variance. We employed descriptive statistics and Pearson correlation analysis. The regression findings are presented using data visualization methods provided by the sjPlot package (Lüdecke, 2023).

Results

It was determined that 56.8% had a doctoral degree, 60.8% had diabetes in their first and second-degree relatives, 78.4% slept less than seven hours, and 52.8% did not exercise (Table 1). The average daily sleep duration of the academicians was determined to be 6.24 ± 1.26 hours. The prevalence of hypertension among academicians was determined as 8%.

According to the aggregate results of the FINDRISC, 28.8% of the academics participating had a mild risk of diabetes, 23.2% had a moderate risk, and 12.0% had a high risk. Regarding the overall score on the ISI, 39.2% of the academics scored below the threshold for insomnia. Additionally, 16.8% exhibited moderate clinical insomnia, while 9.6% experienced severe clinical insomnia (Table 2).

The study assessed the relationships between individuals' FINDRISC, ISI, age, body mass index, waist circumference, and daily sleep duration factors. A noteworthy positive correlation was discerned between the FINDRISC variable and the ISI ($r = 0.634$; $p < 0.001$), age ($r = 0.223$; $p < 0.005$,), body mass index ($r = 0.184$; $p < 0.05$), and waist circumference ($r = 0.358$; $p < 0.001$) variables. Furthermore, a substantial negative correlation was evident between daily sleep duration and the ISI ($r = -0.453$; $p < 0.001$), indicating of a moderate to strong inverse relationship ($p < 0.001$) (Table 3).

It was confirmed that there was no multicollinearity issue among the independent variables based on the Variance Inflation Factor (VIF) values (VIF < 10) (James et al., 2013). This ensured that the regression model's assumptions were adequately met, allowing for reliable interpretations and conclusions. The regression analysis revealed a significant negative association between daily sleep hours and the FINDRISC score, indicating that longer sleep duration was associated with a lower risk of diabetes ($\beta = -1.25$, $p < 0.001$). The results of the research indicate that the variables that were analyzed, including age, hours spent sitting during the day, and average daily working hours, were not significantly related to the risk of diabetes in this model (Figure 1).

Table 1: Some Characteristics of Academics (n = 125)

Characteristics	Variables	n	%
Gender	Female	86	68.8
	Male	39	31.2
Marital Status	Married	87	69.6
	Single	38	30.4
Educational level	Master's Degree	54	43.2
	Doctorate	71	56.8
Title	Professor	11	8.8
	Associate Professor	6	4.8
	Assistant Professor	20	16.0
	Lecturer	25	20.0
	Research Assistant	63	50.4
Perception of Health	Excellent	16	12.8
	Good	82	65.6
	Moderate	20	16.0
	Poor	7	5.6
Average Daily Working Hours	4-8 hours	45	36.0
	9-12 hours	63	50.4
	13-16 hours	17	13.6
Hours Spent Sitting During the Day	1-3 hours	13	10.4
	4-6 hours	50	40.0
	7-9 hours	42	33.6
	10-12 hours	14	11.2
	13-15 hours	6	4.8
Average Daily Sleep Hours	4-5 hours	31	24.8
	6-7 hours	67	53.6
	8-9 hours	27	21.6
Time to Fall Asleep	Immediately	14	11.2
	5- 10 minutes	37	29.6
	11-20 minutes	23	18.4
	21dk- 1 hours	51	40.8
Presence of Sleep Problems	Yes	73	58.4
	No	52	41.6
Feelings Upon Awakening	Tired	85	68.0
	Energetic	5	4.0
	Rested	35	28.0
Satisfaction with Sleep Duration	Satisfied	47	37.6
	No Satisfied	78	62.4
Feeling Sleepy During the Day	Yes	55	44.0
	No	24	19.2
	Sometimes	46	36.8
Presence of High Blood Pressure	Yes	10	8.0
	No	115	92.0
Frequency of Exercise	3 times a week and above	14	11.2
	1-2 times a week	45	36.0
	Never	66	52.8
Presence of Chronic Illness	Yes	22	17.6
	No	103	82.4.
Weight	Thin-normal weight	68	54.4
	Overweight-obese	57	45.6
Waist Circumference	<94 for men <80 for women	76	60.8
	94-102 for men 80-88 for women	32	25.6
	>102 for men >88 for women	17	13.6
Presence of Diabetes in the Family	Diabetes absent	49	39.2
	Present in 1st Degree	42	33.6
	Present in 2nd Degree	34	27.2

n: Number; %: Percentage.

The regression analysis revealed a statistically significant inverse relationship between the number of hours slept per day and the ISI. This indicates that longer sleep duration has a significant effect on reducing insomnia severity. The beta coefficient for this relationship was -2.28, with a p value of less than 0.001. The investigation did not identify any statistically significant correlations between the ISI and other variables that were evaluated, including body mass index, daily sitting time, average daily working hours, and age. These factors did not significantly predict the severity of insomnia in this model (Figure 2).

Discussion

The discussion section of the study presents an analysis of the participants' characteristics, the mean values of the FINDRISC and ISI scores, the correlation between FINDRISC and ISI, and the impact of these findings.

Type 2 diabetes is a disease that can persist for many years without symptoms. Detecting the disease during the asymptomatic period allows for the management of risk factors, thereby delaying or preventing the onset of diabetes (Türkiye Society of Endocrinology and Metabolism, 2022). This study has revealed associations between insomnia severity and diabetes risk factors among academicians without diabetes. Sleep duration, sleep quality, and nocturnal sleep are emerging areas of research regarding diabetes and its risk (Xu, Song, Hollenbeck, Blair, Schatzkin & Chen, 2010; Reutrakul & Van Cauter, 2018; Wu et al., 2021).

Table 2: Presents the Risk Based on the Total Scores of Academics on Finnish Diabetes Risk Test and the Insomnia Severity Index (n = 125)

Scale	Total Score	Risk Level	n	%
FINDRISC	< 7	Low	43	34.4
	7 - 11	Mild	36	28.8
	12 - 14	Moderate	29	23.2
	15 - 20	High	15	12.0
	> 20	Very High	2	1.6
ISI	0 - 7	Insignificant level of insomnia	43	34.4
	8 - 14	Below insomnia threshold	49	39.2
	15 - 21	Clinical level of insomnia (moderate severity)	21	16.8
	22 - 28	Clinical insomnia (severe)	12	9.6

FINDRISC: Finnish Diabetes Risk Test; ISI: Insomnia Severity Index; n: Number; %: Percentage

Table 3: Correlations of some Variables, Finnish Diabetes Risk Test and Insomnia Severity Index Scores among Academics (n = 125)

		FINDRISC Total Score	ISI Total Score	Age	Weight	Body mass index
ISI	r†	0.634				
	p	< 0.001*				
Age	r†	0.223	-0.087			
	p	< 0.005 **	0.338			
Body mass index	r†	0.184	0.065	0.216		
	p	< 0.005 **	0.472	< 0.005 **		
Waist Circumference	r†	0.358	0.089	0.282	0.479	
	p	< 0.001*	0.323	< 0.005 **	< 0.001*	
Daily Sleep Duration	r†	-0,393	-0.453	-0.215	-0.025	-0.150
	p	< 0.001*	< 0.001*	< 0.005 **	0.779	0.094

FINDRISC: Finnish Diabetes Risk Test; ISI: Insomnia Severity Index; †: Pearson Correlation Analysis; *p < 0.001; **p < 0.05.

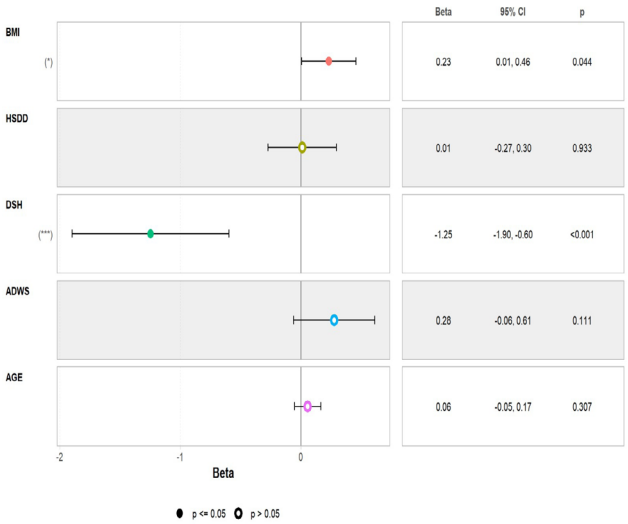

Figure 1: Regression model established with FINDRISC as the dependent variable

BMI: Body Mass Index; HSDD: Hours Spent Sitting During the Day; DSH: Daily Sleep Duration; ADWS: Average Daily Working Hours AGE: Age; FINDRISC: Finnish Diabetes Risk Test

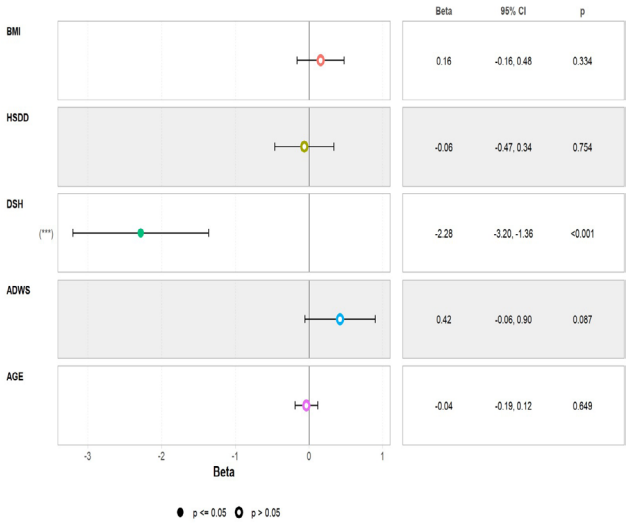

Figure 2: Regression model established with ISI as the dependent variable

BMI: Body Mass Index; HSDD: Hours Spent Sitting During the Day; DSH: Daily Sleep Duration; ADWS: Average Daily Working Hours AGE: Age; ISI: Insomnia Severity Index.

Diabetes encompasses both preventable and non-preventable risk factors. Age and genetic background are considered fixed risks, whereas lifestyle choices such as physical activity, diet, and managing obesity are adjustable risks. It was found that a significant portion (60.8%) of the academics surveyed had diabetes in their families among first - and second - degree relatives in the study. This observation aligns with findings by Kulak et al. (2019), where 55.5% of their subjects reported a familial predisposition towards T2DM. Similarly, Furthermore, a study conducted in Kuwait revealed that 71.9% of participants had a familial predisposition to diabetes (Awad & Alsaleh, 2015). This widespread familial prevalence suggests a higher probability of developing diabetes due to these non-modifiable genetic factors.

In this study, nearly half (45.6%) of the academicians were found to be overweight, which posed a significant risk for diabetes. Similar results have been reported in the literature (Çevik et al., 2016; Kulak et al., 2019). Çevik et al. (2016) reported an obesity rate of 32.7% in their study on determining diabetes risk factors. Being overweight was a known risk factor for diabetes; therefore, the overweight status of the participating academicians could be considered a risk for diabetes.

A notable percentage of the academics displayed waist circumferences that suggest a heightened susceptibility to diabetes in the study. This emphasizes the high occurrence of central obesity among this group, which is a recognized condition that increases the risk of diabetes and other metabolic problems. Similarly, in their study, Çevik et al. (2016) found that waist circumference measurements were higher, providing additional evidence for the link between greater waist circumference and health risks. These findings emphasize the necessity of focused efforts to tackle obesity and associated health concerns among academics.

In this study, a significant proportion of the participating academicians reported not engaging in any exercise, with 52.8% reporting no exercise and 36% reporting exercising 1-2 times per week. Various studies examining exercise behaviors in adults have reported different rates (Alebiosu et al., 2013; Çevik et al., 2016; Kulak et al., 2019). For instance, Çevik et al. (2016) reported a non-exercise rate of 74.6%, whereas a study conducted in Nigeria with 58,567 participants reported a non-exercise rate of 69.6% (Alebiosu et al., 2013). The finding that a significant number of academicians do not exercise for more than 30 minutes a day is concerning in terms of diabetes risk. These outcomes are thought to be associated with academics spending additional hours working at computers, leading to more sedentary behavior.

The study indicated that the prevalence of hypertension among academicians was 8%, which was comparatively lower than the rates reported in other studies. Naranjo, Rodríguez, Llera and Aroche (2013) reported a prevalence of 34.7%, while Awad and Alsaleh (2015) reported 13.4%. The lower prevalence of hypertension among academicians was a positive finding, suggesting better health outcomes for this professional group.

In this study, the diabetes risk levels of academicians were assessed using the FINDRISC questionnaire, with an average T2DM risk score of 10.4 ± 4.8. For 13.6% of the participating academicians, the likelihood of receiving a diagnosis of T2DM in the next 10 years was considered high. When reviewing studies using the same risk assessment tool (FINDRISC), it was noted that risk score levels varied significantly. While Makrilakis et al. (2010) found a risk score of 17.5 ± 2.4 in a study conducted in Greece, Makrilakis et al. (2011) reported a mean FINDRISC score of 12.6 ± 4.9, and Çevik et al. (2016) reported an average risk score of 11.99 ± 6.21 in a study conducted in northeastern Türkiye. The risk score levels in these studies indicated a moderate to high risk of T2DM. It is now well known that diabetes risk has been increasing every day, constituting a non-communicable epidemic (WHO, 2021). According to our study, 23.2% of academicians fell into the intermediate risk category, while 13.6% were classified as high or very high risk. This emphasizes the significance of implementing preventive measures.

The study found a positive correlation between age, body mass index, waist circumference, and the risk of diabetes. This finding aligns with previous research in similar contexts. Notably, Erdoğan and Coşansu (2017) also reported positive correlations between these metrics and diabetes risk, reinforcing the utility of the FINDRISC tool as a predictor of T2DM risk.

Additionally, the results indicated a clear relationship between reduced insomnia severity and lower diabetes risk, suggesting that higher levels of insomnia correlate with increased T2DM risk scores in this. This observation is consistent with existing literature that highlights the significant impact of sleep impairment on glucose metabolism (Olgun, 2012). Several studies have established a heightened risk of diabetes associated with sleeping fewer than five hours per night (Xu et al., 2010; Wu et al., 2021). These findings highlight the essential significance of sufficient sleep in decreasing the incidence of diabetes.

The findings of this study demonstrated a correlation between longer periods of sleep and a reduced likelihood of developing diabetes. This finding aligned with several studies in literature. For instance, Buxton and Marcelli (2010) found that an adequate amount of sleep was a crucial element in decreasing the likelihood of developing T2DM. Additionally, Knutson and Van Cauter (2008) emphasized the direct effects of sleep duration on metabolic functions and glucose regulation. These findings suggested that promoting adequate sleep could be a viable strategy for reducing diabetes risk.

Another significant finding of this study was that longer sleep duration significantly reduced the severity of insomnia. This result was consistent with numerous studies examining the impact of sleep duration on insomnia severity. For instance, Morin, Belleville, Bélanger and Ivers. (2006) highlighted the critical role of sufficient sleep duration in alleviating insomnia symptoms. Similarly, a recent study found that both insomnia and short sleep duration increased the risks of hypertension and diabetes (Johnson et al., 2021). These results underscored the importance of adequate sleep-in managing insomnia severity and related health risks.

This study also found that other variables, such as hours spent sitting during the day, average daily working hours, and age, did not have a statistically significant impact on either the FINDRISC or ISI. This finding paralleled some studies in literature. For example, Nilsson, Månsson and Nilsson (2004) indicated that sitting time did not have a direct effect on diabetes risk. Similarly, Vgontzas et al. (2008) found no significant impact of age and daily working hours on the severity of insomnia. These results suggested that factors other than sitting time, working hours, and age might play more crucial roles in predicting diabetes risk and insomnia severity.

Limitations

As a limitation of this study, potential confounding variables such as dietary habits, stress levels, or the use of sleep aids were not accounted for, which could influence both sleep patterns and diabetes risk.

Conclusion

This study highlights the significant association between insomnia severity, sleep duration, and the risk of T2DM among academicians. Additionally, the strong correlation of FINDRISC scores with age, waist circumference, and body mass index underscore the importance of focusing on modifiable risk factors such as obesity and inactive lifestyles to mitigate diabetes risk.

While the established risk factors for diabetes are well-documented, this study also identified reduced sleep duration as a significant risk factor. The majority of the academicians in this study were found to sleep less than the recommended seven hours, highlighting the essential role of adequate sleep duration in lowering diabetes risk within this population.

Given these insights, it is imperative to adopt preventive strategies that emphasize lifestyle changes, including regular exercise, healthy eating, and sufficient sleep. Nurses, in particular, play a vital role in this regard. Such measures are essential to curb the development of diabetes and promote better overall health among academicians.

Ethical Considerations: Ethical approval was obtained from the Ethics Committee of Ankara Yıldırım Beyazıt University for this study (Date: 22.11.2019 and No: 2019/511).

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