

ORIGINAL ARTICLE

The Relationship Between Type D Personality, Bedtime Procrastination and Sleep Quality

D Tipi Kişilik, Uyku Vaktini Erteleme ve Uyku Kalitesi Arasındaki İlişki

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How to cite ?

Uygur H, Demiroz D, Uygur ÖF, Duman A. The Relationship Between Type D Personality, Bedtime Procrastination and Sleep Quality. Genel Tıp Derg. 2024;34(1):104-108

ABSTRACT

Background/Aims: Bedtime procrastination (BP) is an unhealthy sleep behavior, but its relationship with Type D (distress) personality has never been examined. This study aimed to investigate the relationship between Type D Personality, BP, and Sleep Quality in university students.

Methods: In this cross-sectional study, we applied the sociodemographic sleep data form, Type D personality scale (DS-14), Bedtime Procrastination Scale (BPS), Pittsburgh Sleep Quality Index (PSQI) (subjective sleep quality and daytime dysfunction subscales), Insomnia Severity Index (ISI), and Epworth Sleepiness Scale (ESS). All participants were divided into two groups: Type D personality and non-Type D personality. Sleep variables and scales were compared between these two groups. Additionally, correlation analysis was performed between the scales and the subdimensions of Type D personality.

Results: We completed our study with 209 university students (66%, n = 138 female and 34%, n=71 male). The mean age was 22.17 ± 4.33, and 51.2% of the participants had Type D personality. Sleep quality was poor and insomnia was more severe in participants with Type D personality. Participants with Type D personality had more delayed bedtime. Negative affectivity was associated with poor sleep quality, more severe insomnia and BP, but social inhibition was not associated with BP.

Conclusion: Clinicians should consider the negative affectivity sub-dimension of Type D personality contributing to BP behavior among university students when planning interventions to reduce BP behavior.

Keywords: Type D Personality, Bedtime Procrastination, Negative Affectivity, Sleep Quality

ÖZ

Amaç: Uyku vaktini erteleme (UVE) sağlıksız bir uyku davranışdır, ancak D tipi (stresli) kişilikle ilişkisi daha önce hiç incelenmemiştir. Bu çalışma, üniversite öğrencilerinde D Tipi Kişilik, UVE ve Uyku Kalitesi Arasındaki ilişkiyi araştırmayı amaçlamıştır.

Yöntemler: Bu kesitsel çalışmada katılımcılara Sosyodemografik uyku veri formu, D Tipi Kişilik Ölçeği (DS-14), Uyku Vaktini Erteleme Ölçeği (UVE), Pittsburgh Uyku Kalitesi İndeksi (PUKİ) (öznel uyku kalitesi ve gündüz işlev bozukluğu alt ölçekleri), Uykusuzluk Şiddeti İndeksi (UŞİ) ve Epworth Uykululuk Ölçeği (EUÖ) uygulandı. Tüm katılımcılar D tipi kişiliğe sahip olanlar ve olmayanlar olmak üzere iki gruba ayrıldı. Bu iki grup arasında uyku değişkenleri ve ölçekler karşılaştırıldı. Ayrıca ölçekler ve D tipi kişiliğin alt boyutları arasında korelasyon analizi uygulandı.

Bulgular: Çalışmamızı 209 üniversite öğrencisi (%66, n=138 kadın ve %34, n=71 erkek) ile tamamladık. Ortalama yaş 22.17 ± 4.33 idi ve tüm katılımcıların %51,2'si D tipi kişiliğe sahipti. D tipi kişiliğe sahip katılımcılarda uyku kalitesi kötüydü, uykusuzluk daha şiddetliydi. D Tipi kişiliğe sahip katılımcılar uyku vaktini daha fazla erteliyorlardı. Olumsuz duygulanım, kötü uyku kalitesi, daha şiddetli uykusuzluk ve UVE ile ilişkiliydi ancak sosyal inhibisyon UVE ile ilişkili değildi.

Sonuç: Klinisyenler, UVE davranışını azaltmaya yönelik müdahaleleri planlarken, üniversite öğrencilerinde UVE davranışına katkıda bulunan D Tipi kişiliğin olumsuz duygulanım alt boyutunu dikkate almalıdır.

Anahtar Kelimeler: D Tipi Kişilik, Uyku Vaktini Erteleme, Olumsuz Duygulanım, Uyku Kalitesi

Introduction

Good sleep is vital for physical and mental health in young people (1). However, many researchers have found that poor sleep quality is a widespread problem among university students (2). In addition, these researchers showed that poor sleep quality seriously impacts university students' school performance and social life by causing fatigue, learning difficulties, and attention problems (3-5). Factors such as sex, chronotype and educational and psychological distress can influence sleep quality in college students (6-10). Type D personality, namely distressed personality, tends to experience negative emotions and avoid personal interaction (11). In parallel with

these two traits, Type D is identified as the synergistic union of two features: negative affectivity (NA) and social inhibition (SI) (12). Type D personality has been predicted to cause many adverse health problems, especially cardiac diseases. It is also predisposed to depression, anxiety, and social phobia (13,14). Studies conducted in recent years have shown that Type D personality can trigger insomnia in many different populations such as heart patients, police officers, university students, and nurses (15,16). Recent research found that adolescents with Type D personality had an increased risk of having poor sleep quality and reduced total sleep duration (17). Additionally, Akram et al.

detected that the NA subdimension contributes more to insomnia than SI (18).

Procrastination is a typical attitude among university students (19). It is generally defined as procrastination when an individual voluntarily delays a job despite knowing it will have negative outcomes (20). Much research has focused on academic procrastination-related behaviors in college students (20). In recent years, studies on bedtime procrastination (BP) behavior before going to bed have attracted attention (21). BP was first described by Kroese et al. (22). BP is an individual's inability to go to bed at the planned time without external reasons that justify these behaviors (22). Many studies showed that BP is ubiquitous among university students and is frequently caused by excessive adverse outcomes (insufficient sleep, insomnia and poor sleep quality) in undergraduate students (23,24). Therefore, searching for related factors to BP among university students is necessary to improve sleep quality. However, to our knowledge, there is no research about the association of BP with Type D personality. This study aimed to determine the relationship between BP, sleep quality, and Type D personality among university students.

Material and Methods

Study Procedure

This cross-sectional study is conducted on university students among whom bedtime procrastination is most common. A total of 209 volunteers were included in the survey carried out on the Ataturk University Central campus between 01.02.2023 and 01.04.2023. The inclusion criteria for the study were being a university student and volunteering to participate. There were no exclusion criteria for our research. We received approval for our study from the ethics committee of Atatürk University Faculty of Medicine (Date 26.01.2023, Decision number:71). We applied the following six instruments to the participants. The sociodemographic sleep data form (we prepared about age, gender, weight, height, sleep habits etc.), Type D personality scale (DS-14), Insomnia Severity Index (ISI), Bedtime Procrastination Scale (BPS), Pittsburgh Sleep Quality Index (PSQI) (only two subscales; subjective sleep quality, daytime dysfunction), Epworth Sleepiness Scale (ESS).

Measures

Type D Personality Scale

We evaluated Type D personality using the 14-item DS14. The scale contains two 7-item subdimensions to assess NA (e.g., "I often feel unhappy") and SI (e.g., "I am an introvert kind of person"), with a total score of 28 on each sub-scale (11). Traditionally, individuals who score ten or more on both subscales are classified as Type D (11).

Bedtime Procrastination Scale

The BPS is a brief, self-rated scale used to assess BP. The BPS contains nine items and nine different scenarios of BP behaviors. Each item ranges from 1 (almost never)

to 5 (almost always) according to the frequency of experiencing each scenario. The higher score presents a worse BP (22).

Pittsburgh Sleep Quality Index

The PSQI is the widely used scale to evaluate sleep quality in the literature. It comprises seven subdimensions: sleep time, sleep latency, sleep disturbance, sleep efficiency, use of sleep drugs, sleep quality, and daytime sleep dysfunction. Each subsection is scored between 0 and 3 points. High scores present poor sleep quality (29,30). It is common in some studies where the participants are asked only some of the seven subsections. In our study, we asked participants questions about sleep quality and daytime sleep dysfunction subsections.

Insomnia Severity Index

The ISI has seven items evaluating the severity of insomnia symptoms over the past two weeks. Items are on a 5-point Likert scale, and higher scores show higher insomnia severity (31,32).

Epworth Sleepiness Scale

ESS is an 8-item self-report scale that detects daytime sleepiness. Items assess the tendency to fall asleep in everyday daytime situations, obtaining a composite sleepiness severity score (33). The eight items on the IDS are rated on a Likert scale from 0 = no chance to 3 = high chance, producing a total score ranging from 0 to 24. The ESS has shown good internal consistency (33). A total score >10 identifies excessive daytime sleepiness. We yielded a Cronbach's alpha of 0.80 for ESS in our study.

Statistical Analysis

We analyzed data using SPSS 20.0. We performed descriptive statistical analysis to determine the characteristics of sociodemographic variables (gender, age, marital status, sleep status). Continuous variables were shown as the mean plus the standard deviation, and categorical variables were offered through frequency. Correlation analyses were performed with Pearson correlation analysis in cases of normal distribution and with Spearman correlation analysis in cases where there was no normal distribution. We divided the study sample into Type D personality and non-Type D according to DS-14. We first compared sociodemographic and sleep values between these two groups. Second, we compared BP, sleep quality, insomnia severity index, and daytime sleepiness scores. Subsequently, we conducted a correlation analysis between Type D personality subdimensions (NA or SI), BP, and other instruments.

Results

Participants

We completed our study with 209 university students (66%, 138 female and 34%, 71 male). The mean age was 22.17 ± 4.33 , and the mean Body Mass Index (BMI) was 22.98 ± 3.54 . The vast majority of participants were not married, and most lived with their families. Table

Table 1. Sociodemographic and clinic variables of all participants

Age (years)	22.17 (4.33)
BMI (kg/m ²)	22.98 (3.54)
	n (%)
Sex	
Male	71 (34)
Female	138 (66)
Marital status	
Not married	200 (95.7)
Married	9 (4.3)
Living	
Alone	24 (11.5)
With family	39 (18.7)
With friends	146 (69.9)
Smoking	
Yes	32 (15.3)
No	177 (84.7)
Alcohol use	
Yes	22 (10.5)
No	187 (89.5)
D type personality	
Yes	107 (51.2)
No	102 (48.8)

Table 2. Comparison of those with and without type D personality in terms of BP and other sleep and demographic variables

Variables	D type personality (n= 107)	Non- D type personality (n=102)	p
Age	22.07 ± 4.57	22.27 ± 4.09	0.72
Gender (female/male)	85/22	53/49	< 0.001
BMI	22.52 ± 3.70	23.46 ± 3.32	0.06
BPS	29.10 ± 7.72	25.81 ± 7.47	< 0.001
ISI	10.73 ± 5.48	7.77 ± 4.42	< 0.001
PSQI-Sleep Quality	1.63 ± 0.66	1.38 ± 0.67	< 0.001
PSQI-Daytime Dysfunction	1.55 ± 0.91	1.12 ± 0.83	< 0.001
ESS	8.68 ± 5.01	7.32 ± 4.07	0.03

BMI: Body Mass Index; BPS: Bedtime Procrastination Scale; ISI: Insomnia Severity Scale; PSQI: Pittsburg Sleep Quality Index; ESS: Epworth Sleep Scale

Table 3. Correlation of negative affectivity (NA) and social inhibition (SI) with bedtime procrastination and other sleep variables

	1	2	3	4	5	6	7
NA	-						
SI	0.56**	-					
BPS	0.23**	0.08	-				
ISI	0.43**	0.15*	0.49**	-			
PSQI-Sleep Quality	0.33**	0.07	0.49**	0.65**	-		
PSQI-Daytime Dysfunction	0.36**	0.14*	0.47**	0.62**	0.55**	-	
ESS	0.13*	0.09	0.08	0.16*	0.01	0.16*	-

NA: Negative Affectivity; SI: Social Inhibition; BPS: Bedtime Procrastination Scale; ISI: Insomnia Severity Scale; PSQI: Pittsburg Sleep Quality Index; ESS: Epworth Sleep Scale

1 presents the sociodemographic clinic variables of all participants. 51.2% of the participants had Type D personality (they scored 10 points or more on the NA and SI subscales).

Sleep Variables of Participants

Thirty-five participants (16.8%) slept less than 6 hours. On weekdays, 66% of the participants went to bed after midnight, while on the weekends, 80.4% of the 168 participants went to bed after midnight. The mean ISI of the participants was 9.29 ± 5.20 , the mean PSQI score for sleep quality was 1.51 ± 0.68 , the mean PSQI daytime dysfunction score was 1.34 ± 0.90 , the mean BPS was 27.49 ± 7.76 , the mean DS-14 score was 25.04 ± 11.94 and the mean ESS score was 8.01 ± 4.61 . Thirty-five participants (16.8%) slept less than 6 hours. On weekdays, 66% of the 138 participants went to bed after midnight, while on the weekends, 80.4% of the 168 participants went to bed after midnight.

Comparison of participants with Type D personality and non-Type D personality in terms of BP and other sleep variables

We compared age, gender, BMI, BPS, ISI, PSQI sleep quality, PSQI daytime dysfunction, and ESS scores between participants with Type D personality and non-Type D personality. There was no significant difference in age and BMI between the two groups. There were statistically significantly more females in participants with Type D personality than non-Type D. Participants with Type D personality had significantly higher BPS, ISI, PSQI sleep quality, PSQI daytime dysfunction, and ESS scores than non Type D participants. Table 2 compares participants with Type D personality to non Type D concerning BP and other sleep variables.

Correlation of NA and SI with bedtime procrastination and other sleep variables

We conducted a correlation analysis between NA and SI, BP and other sleep parameters. NA was statistically significantly associated with BP ($r = 0.23$, $p < 0.001$), insomnia severity ($r = 0.43$, $p < 0.001$), sleep quality ($r = 0.33$, $p < 0.001$), and daytime dysfunction ($r = 0.36$, $p < 0.001$), no significant correlation was detected between SI and BPS and sleep quality. A lower significance level correlation was found between SI and insomnia severity ($r = 0.15$, $p < 0.01$) and daytime dysfunction ($r = 0.19$, $p < 0.01$). Table 3 presents correlation details between NA, SI, BP, insomnia severity, sleep quality, and daytime dysfunction.

Discussion

This research is the first paper to evaluate the association between Type D personality traits and BP and sleep quality among university students. The major findings of this study are (i) 51.2% of all participants had Type D personality, (ii) sleep quality was poor, and insomnia was more severe in participants with Type D personality, (iii) Participants with Type D personality had more delayed bedtime, (iiii) NA, the subdimension of Type D personality, was associated with poor sleep quality, more severe insomnia, and more BP, but SI was

not associated with BP.

In our study, participants with Type D personality had poor sleep quality, more severe insomnia, worse daytime functionality related to insomnia, and more daytime sleepiness than Non-Type D participants. This result was consistent with previous studies. Many researches have found that Type D personality predicts insomnia (17,18). Sleep-related negative tone thoughts play a central role in perpetuating insomnia. Negative thoughts such as worry, for example, I cannot sleep because I am anxious, or rumination, for instance, I cannot concentrate today as I could not sleep last night, causing maintenance of insomnia. Type D personality is highly vulnerable to the negative outputs of general distress (18). In accordance with this, worry and rumination about sleep may increase in Type D personality, especially with NA subdimensions (18). In addition, sleep reactivity, defined as the possibility of experiencing insomnia after a stressful event, was higher in individuals with Type D personality than non-D type (16,34). This finding is compatible with the relationship between Type D personality and insomnia mentioned above.

One of the main findings of our study was that participants with Type D personality delayed bedtime more than participants with non-Type D personality, and BP was associated with NA while SI was not. BP is a bedtime-related procrastination behavior that was identified in 2014 (22). Many studies have been conducted to understand the factors associated with BP in university students (35-37). BP is associated with short sleep duration, poor sleep quality, daytime fatigue, depression, and anxiety (37). Additionally, in a recent study on the relationship between BP and personality traits, BP was positively correlated with psychoticism and neuroticism (38). Recent research on the causality of BP has found that BP has three causes: deliberate procrastination, mindless procrastination, and strategic delay (39). The last one, strategic delay participants who used in strategic delay, reported going to bed late because they felt they needed to fall asleep, suggesting that despite describing themselves as procrastinating, their BP may be linked to untreated insomnia (39). Since Type D personality predicts insomnia, individuals with Type D personality may have undiagnosed insomnia patients or be strategically delaying their sleep times to sleep better. In addition, participants with Type D personality often use more maladaptive health-related behaviors (e.g., smoking), avoiding facilitating health attitudes (e.g., exercise) (40,41). Individuals with Type D personality prone to exhibit unhealthy behavior may have problematic smartphone use associated with BD beyond strategy delay. Type D personality traits coincide with neuroticism and extraversion. NA presents high neuroticism traits while SI presents low extraversion traits (15). In addition, problematic smartphone use was positively correlated with neuroticism (42). Therefore, it is quite possible for participants with Type D personality to have problematic smartphone use. These two relations may have caused them to delay

their sleep even more. From a cognitive perspective, individuals with Type D personality, who tend to have more negative feelings, may have made more sleep-related efforts before bed or in bed, which may also be related to BP. A recent research showed that sleep effort is associated with BP (16). These possibilities constitute the path from Type D personality, especially NA, to BP.

There were four limitations of our study. First, the cross-sectional design did not ensure causal and long-term results about the relationship between BP and Type D personality traits. Second, the sample was primarily female, and the mean age was relatively low; therefore, the results may be somewhat generalizable to males and the older population. Third, we obtained data through self-report scales, prone to bias in participant answers. Fourth, our study sample were Turkish university students, so the results are not generalizable to other populations.

Conclusion

The negative affectivity is associated with BP, whereas social inhibition is not. Future studies on BP and Type D personality are required to clarify whether there is a causal relationship.

Author Contributions

Conception: H.U., D.D. Design: H.U., A.D., Data Collection and Processing: A.D., H.U., O.F.U., Supervision: O.F.U., D.D., Analysis and Interpretation: H.U., D.D., Literature Review: H.U., D.D., O.F.U., Writer: H.U., D.D., Critical Review: H.U., D.D.

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