

The Relation between Chronotype, Depression, Anxiety, Stress, Internet Addiction and Academic Achievement in University Students

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Abstract: The purpose of this study; to determine the relation between chronotype, depression, stress, anxiety, internet addiction and academic achievement levels of university students with a descriptive and cross-sectional research design. The study was conducted with 645 university students. Data was collected using Information Form, Depression, Anxiety, Stress-21 Scale (DASS21), The Short Form of Young's Internet Addiction Test (YIAT-SF) and Morning-Evening Questionnaire (MEQ). Data were analyzed by means, numbers, percentages, independent t-test and correlation. It was determined that the students' depression levels were moderate, their stress levels were mild, and their anxiety levels were mild. It was determined that the students were average internet users according to their total Young Internet Addiction Scale score averages. It was determined that the participants' chronotypes could be evaluated as intermediate types. It was determined that female students' stress and anxiety scores were statistically significantly higher than male students. ($p < 0.05$). It was found that a significant positive, weak relationship was found between the YIAT-SF total score and the level of depression, stress, anxiety. In addition, a weak negative relationship was found between the YIAT-SF total score average and the Morning-Evening Questionnaire score. The study shows that chronotypes are closely related to students' mental health and susceptibility to internet addiction, and that internet addiction plays an important role in academic success.

Keywords: Chronotype, internet addiction, academic achievement, depression, stress, anxiety.

Üniversite Öğrencilerinde Kronotip Depresyon, Anksiyete, Stres, İnternet Bağımlılığı ve Akademik Başarı Arasındaki İlişki

Öz: Bu çalışmanın amacı; üniversite öğrencilerinde kronotip, depresyon, stres, anksiyete, internet bağımlılığı ve akademik başarı arasındaki ilişkiyi tanımlayıcı kesitsel araştırma deseni ile değerlendirmektir. Çalışma 645 üniversite öğrencisi ile gerçekleştirildi. Veriler Bilgi Formu, Depresyon, Anksiyete, Stres-21 Ölçeği (DASÖ21), Young İnternet Bağımlılığı Ölçeği Kısa Formu (YİBÖ) ve Sabahçıl-Akşamcıl Anketi (SAKCA) kullanılarak toplandı. Veriler ortalama, sayı, yüzdelik ve bağımsız gruplarda t testi ve korelasyon

Geliş tarihi/Received: 02.09.2024

Kabul Tarihi/Accepted: 11.12.2024

Makale Türü: Araştırma Makalesi

* This study partly presented as an oral poster at 7th International Acharaka Congress on Medicine, Nursing, Midwifery, and Health Sciences Congress on June 20-22, 2024.

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Atf için/To cite: Ayhan, C. H., Tanhan, F., Aktaş, M. C., & Yıldız, E. (2024). The relation between chronotype, depression, anxiety, stress, internet addiction and academic achievement in university students. *Van Yüzüncü Yıl University Journal of Education*, 21(3), 1005-1023. <https://doi.org/10.33711/yyuefd.1541823>

ile analiz edildi. Öğrencilerin depresyon düzeylerinin orta, stres düzeylerinin hafif orta ve anksiyete düzeylerinin hafif orta olduğu belirlendi. Öğrencilerin Young İnternet Bağımlılık Ölçeği toplam puan ortalamalarına göre ortalama internet kullanıcısı oldukları belirlendi. Katılımcıların kronotiplerinin ara tip olarak değerlendirilebilecekleri saptandı. Kadın öğrencilerin stres ve anksiyete puanlarının erkek öğrencilere kıyasla istatistiksel açıdan anlamlı düzeyde yüksek olduğu belirlendi ($p<0,05$). YİBÖ toplam puan ortalaması ile depresyon, stres, anksiyete düzeyleri arasında pozitif yönde, zayıf ve anlamlı bir ilişki saptandı ($p<0,001$). Ayrıca YİBÖ toplam puan ortalaması ile Sabahçıl-Akşamcıl anketi puanı arasında zayıf düzeyde negatif yönde bir ilişki saptandı. Yapılan çalışma kronotiplerin öğrencilerin ruh sağlığı ve internet bağımlılığına yatkınlığı ile yakından ilişkili olduğunu ve internet bağımlılığının akademik başarı üzerinde önemli bir rol oynadığını göstermektedir.

Anahtar kelimeler: Kronotip, internet bağımlılığı, akademik başarı, depresyon, stres, anksiyete

Introduction

The biological activities of living things consist of cycles called biological rhythms. Biological rhythms are related to the timing of periods such as reproduction, feeding and sleeping of living things. These biological rhythms help the organism adapt to the environment in which it lives, for example, body temperature and epinephrine levels increase just before waking up to prepare for the new day, and decrease before going to sleep, making it easier to fall asleep (Aktaş & Özdemir, 2023; Selvi et al., 2011). The vital activities of living things within a certain rhythm vary among themselves according to the cycle times of the rhythm (Selvi et al., 2011). Circadian rhythm refers to a biological process that occurs in all living organisms, covers a 24-hour period, and keeps the body alert to possible changes around it. Personal circadian rhythm changes are told by chronotype (Toktaş & Eskiocak, 2018). Chronotype indicates the period of the day when an individual is physically and cognitively active (Sertçelik, 2016; Tekin, 2021). Chronotype, which refers to an individual's natural preference for being active during certain times of the day, can influence various psychological and behavioral outcomes, including mental health and academic performance. Although chronotype is based on genetic and biological basis, it is also affected by socio-demographic characteristics, psychosocial and geographical factors. It is generally known that men are more evening-oriented than women. The most common chronotype is the intermediate type, while the least common is the evening type. The morning type is more common in newborns and childhood, and the evening type is more common in adolescence and young adulthood (Zimmermann, 2011). As the years progress, the tendency towards the morning type increases (Randler, 2016).

The relation between chronotype and mental health is well documented. Individuals with an evening chronotype have a harder time adapting to daily life and face more psychiatric problems compared to individuals with a morning chronotype. It is associated with short sleep duration, insufficient sleep and poor sleep quality, and inadequate sleep causes negative mood and decreased ability to cope with negative emotions (Selvi et al., 2011). Anxiety, depressive symptoms and substance abuse are more common in young people who are active in the evening (Erdoğan et al., 2022). It is known that individuals with evening chronotype are at higher risk emotionally and cognitively, in terms of depressive symptoms and academic failure because daily life is more suitable for the morning chronotype, and the fatigue and insomnia brought about by an irregular sleep cycle. Impaired sleep quality reduces cognitive and psychological efficiency. (Roeser et al., 2013). Fluctuations in the evening type's adaptation to social life (social jetlag), chronic fatigue and inefficiency can exacerbate depression, as well as prolong its duration and make the treatment

process difficult. For this reason, individuals should be aware of their chronotypes, which have an important place in their mental and spiritual health, and a path specific to the person and type should be followed in the treatment of the problems experienced (Au & Reece, 2017; Keller et al., 2016). Studies conducted on patients with anxiety, depression, bipolar and psychosis have shown that these individuals have a more evening chronotype. In summary, individuals' chronotype characteristics have the potential to affect their lives in a wide range of areas, from daily adaptation problems to various psychopathologies (Blachnio et al., 2015; Zimmermann, 2011).

Studies have shown that some features common in people with an evening chronotype are also common in behavioral addictions (Tekin, 2021). Evening types are more prone to internet addiction, especially since exposure to blue light at night disrupts the circadian rhythm and causes sleep disorders. Since internet use before sleep reduces chronotype, sleep quality, and daytime efficiency and causes serious health problems, it is necessary to be aware of this and limit the use of electronic devices (Randler et al., 2014). Today, internet usage is used in every aspect of our lives for different purposes, increasing day by day. Although alcohol and substance addiction come to mind when addiction is mentioned, it is known that there are also constantly recurring and craving behavioral addictions that are not related to a physical substance (Olsen, 2011). One of the most important behavioral addictions is internet addiction, which is the subject of much research today with the rapid increase in its access and users in recent years, through the electronic devices that are always with us in our daily lives (Blachnio et al., 2015).

Academic achievement is also influenced by chronotype and mental health. Studies have shown that students with evening chronotypes may experience lower academic performance due to their misalignment with typical academic schedules, which often favor morning activities (Eker & Yildirim, 2021). Additionally, the stress associated with managing academic responsibilities can further compound feelings of anxiety and depression, particularly among evening types who may struggle with sleep deprivation (Gębska et al., 2022). Conversely, students who adhere to a morning chronotype often report better academic outcomes, likely due to more consistent sleep patterns and better alignment with educational demands (Reddy & Nagothu, 2019).

In the light of the literature, this research was planned to determine the chronotype characteristics of university students who go to university at different times of the day and to examine the level of academic achievement and mental health problems such as anxiety, depression, internet addiction that may be related.

When the national and international studies on the chronotypes of university students and the factors affecting them were examined, no studies were found that examined chronotype, depression, anxiety, stress, internet addiction and academic level variables together. Most chronotype studies examine chronotype, usually in relation to sleeping or eating habits. However, this study examined the effect of chronotype not only on emotional states such as anxiety or depression, but also on behavioral (internet addiction) and performance-related (academic) effects in young adult college students who are particularly prone to depression, anxiety, and internet addiction due to both academic stress and lifestyle changes. It presented a more comprehensive perspective by simultaneously examining the effect of success on the variables. To this end this study sought to answer four research questions:

Q1: What is the level of depression, stress, anxiety and internet addiction level among university students?

Q2: What are the chronotype of university students?

Q3: Does depression, stress, anxiety, internet addiction and chronotype differ by socio-demographic characteristics in university students?

Q4: Is there a relationship between depression, stress, anxiety, internet addiction and chronotype in university students?

Methods

Design

This study was planned to evaluate the chronotype, depression, anxiety, internet addiction and academic achievement levels of university students and the relationship between them with a descriptive cross sectional research design.

Sample of Study

The population of the research consisted of students studying in the faculties and colleges of Van Yüzüncü Yıl University in the 2022-2023 academic year. There are 26857 students registered at Van Yüzüncü Yıl University in the 2022-2023 academic year. The sample size of the research was determined as a minimum of 645 students with a 1% margin of error within a 99% confidence interval using the Epi Info statistical package program. Students who were at school during the period when the research was conducted, volunteered for the research, and filled out the data collection forms correctly and completely were included in the study. Participants selected using the purposeful sampling method.

Setting and Time

The research was carried out between September 2023 and January 2024 in the faculties and colleges at Van Yüzüncü Yıl University, where data collection permission was obtained.

Measures

The data of the research were collected with the “Information Form on Students' Descriptive Characteristics”, “Depression, Anxiety, Stress Scale (DASS21)”, “The Short Form of Young's Internet Addiction Test (YIAT-SF)” and “Morning-Evening Questionnaire (MEQ)”.

Information Form on Students' Descriptive Characteristics

The form created by the researchers based on the literature consisted of a total of 21 questions to determine the students' socio-demographic characteristics (age, gender, marital status, department, class, academic average, family structure, income status, internet using time).

Depression Anxiety Stress Scale (DASS21)

The Turkish validity and reliability study of the scale developed by Clark and Watson (1991) to determine the level of depression, anxiety and stress was conducted by Sarıçam (2018). This scale is a 4-point Likert type scale and consists of 7 questions measuring "depression, stress and anxiety dimensions". An individual getting 5 points or more from the depression subscale, 4 points or more from the anxiety subscale, and 8 points or more from the stress subscale indicates that he or she has a relevant problem (Yılmaz et al., 2017; Sarıçam, 2018).

The Short Form of Young's Internet Addiction Test (YIAT-SF)

The scale was developed by Young (2004) to determine internet addiction and converted into a short form by Pawlikowski et al. (2013). A Turkish validity and reliability study was

conducted by Kutlu et al. (2016). It consists of 12 items and is a five-point Likert type (1 = Never, 5 = Very often). There are no reverse scored items in the scale. A high score from the scale indicates a high level of internet addiction.

Morningness-Eveningness Questionnaire (MEQ)

The Turkish adaptation of the scale developed by Horne and Ostberg to determine morning and evening types in the human circadian rhythm was published by Pündük et al. (2005). It consists of 19 questions that question individuals' physical and psychological performances within 24 hours and the preferred time periods to achieve these performances. Scoring varies between 16-86, with low scores indicating evening type and high scores indicating morning type (Pündük et al., 2005). In the study, individuals were classified as definite evening type (score: 16-30), moderate evening type (score: 31-41), intermediate type (score: 42-58) and moderate morning type (score: 59-69), definite morning type (score: 70-86).

Data Collection Process

The data collection period was determined as September 2023-January 2024, and data was collected within a four-month period. The surveys were explained to the students in the institutions by the researchers, distributed to the students who accepted the research, they were expected to fill them in, and were taken back from the students who filled them out. Data were collected by visiting the faculties where the students were on campus and on the days and hours specified by the faculty members who had suitable courses.

Data Analysis

The data were evaluated using SPSS 29.0 Windows software (SPSS Inc., Chicago, IL, USA). The normality distribution of the data was evaluated using the skewness and kurtosis values. A kurtosis and skewness value between ± 3 indicates a normal distribution (Shao, 2002). Frequency, percentage, mean, and median descriptive statistics were used to examine the sociodemographic characteristics of the students, their depression, anxiety, stress, internet addiction level and the score distribution of the Morning-Evening Questionnaire. Mann Whitney U and Kruskal Wallis tests were used to compare students' scale scores. The level of statistical significance was set at $p < 0.05$.

Ethical Considerations

Prior to starting the study, appropriate ethical clearance was acquired from the Non-Interventional Ethics Committee of Van Yüzüncü Yıl University (2023/09-08) and from the Rectorate of Van Yüzüncü Yıl University. Furthermore, consent was acquired via email from the authors who oversaw the assessment of the scales' validity and reliability for use in the study. Prior to the study, the participants were formally informed, and their complete consent was acquired through both written and verbal ways.

Results

The mean age of the students was 21.68 years, 70.1% were female and 97.8% were single. 75.3% of the students were from a nuclear family structure and 43.7% were 4th grade students. It was determined that the students' parents' education levels were mostly primary school graduates (57.1% for mother and 32.6% for father), 38.4% had an academic average of 3.00-3.50, and 24.5% used the internet for 3-4 hours (Table 1).

Table 1

Socio-Demographic Characteristics of Participants (n=645)

Variable	M±SD	Min-Max
Age (year)	21.68 ± 2.48	17-42
	n	%
Gender		
Female	452	70.1
Male	193	29.9
Department		
Health Science	418	65.3
Education Science	112	17.50
Social Science	54	8.90
Engineering	61	9.60
Marital Status		
Married	14	2.2
Single	631	97.8
Family Structure		
Nuclear Family	486	75.3
Extended Family	159	24.7
Class		
1. Class	118	18.3
2. Class	176	27.3
3. Class	52	8.1
4. Class	282	43.7
5. Class	11	1.7
6. Class	6	0.9
Father's education level		
Illiterate	16	2.5
Primary school graduate	210	32.6
Secondary school graduate	185	28.7
High school graduate	142	22.0
Graduate degree	92	14.2
Mother's education level		
Illiterate	101	15.7
Primary school graduate	368	57.1
Secondary school graduate	96	14.8
High school graduate	43	6.7
Graduate degree	37	5.7
Income Level		
< 5000 TL	122	18.9
5000-8000 TL	119	18.4
8000-15000 TL	172	26.8
15000-20000 TL	113	17.5
> 20000 TL	119	18.4
Grade Point Average		
< 1.50	118	18.3
1.50-2.00	9	1.4

2.00-2.50	41	6.4
2.50-3.00	153	23.7
3.00-3.50	248	38.4
3.50-4.00	76	11.8
(don't specify-missing) *	116	18.0
Internet usage time (hour)		
< 1 hour	13	2.0
1-2 hour	87	13.6
2-3 hour	148	22.9
3-4 hour	158	24.5
4-5 hour	113	17.5
> 5 hours	126	19.5

Participants' level of Depression, Stress and Anxiety, internet addiction and the type of chronotype presented in Table 2. The mean score of Depression was 7.87 ± 5.1 (moderate level), stress was 8.02 ± 4.58 (mild level) and the anxiety was found to be 5.64 ± 4.01 (mild-moderate level). It was determined that the students' Young Internet Addiction Scale total (YIAS) score average was 20.28 ± 11.39 and they were average internet users.

It was determined that the total score average of the Morningness-Eveningness Questionnaire (MEQ) was 51.22 ± 9.66 and they could be considered as an intermediate type. In this sense, it was determined that almost 65% of the students were neither morning nor evening people (intermediate type).

Table 2

Mean Scores of the Students on the Depression, Anxiety, Stress Scale (DASS21), Young Internet Addiction Scale- Brief Form, Morning-Evening Questionnaire (N=645)

Scales	M±SD	Min-Max
DASS 21		
Depression	7.87±5.1	0-21
Stress	8.02±4.58	0-21
Anxiety	5.64±4.01	0-18
YIAT-SF Total Score	20.28±11.39	0-60
MEQ Total Score	51.22±9.66	19-91
	n	%
Definite morning (70-86)	16	2.5
Moderate morning (59-69)	118	18.3
Intermediate (42-58)	414	64.2
Moderate evening (31-41)	79	12.2
Definite evening (16-30)	18	2.8

DASS21 = Depression, Anxiety, Stress Scale, MEQ= Morningness-Eveningness Questionnaire

The comparison of Students' Sociodemographic Characteristics on Depression, Stress and Anxiety (DASS21) Scale was presented in Table 3. It was found that the difference between the Stress subscale mean score of female students and the Anxiety subscale mean score was statistically significant and higher than that of male students ($p < 0.05$) (Table 3).

Table 3

Comparison of Students' Sociodemographic Characteristics on Depression, Stress and Anxiety (DASS21) Scale (N=645)

		Depression		Stress		Anxiety	
		M±SD	Test Value	M±SD	Test Value	M±SD	Test Value
Gender¹	Female	8.12±5.11	t=-1.865	8.38±4.56	t=-3.105	5.97±4.03	t=-3.168
	Male	7.30±5.01	p=0.063	7.17±4.52	p=0.002*	4.88±3.88	p=0.001**
Class²	1. Class	7.27±4.48	F=0.669 p=0.647	7.50±4.01	F=0.548 p=0.740	4.43±3.77	F=1.621 p=0.151
	2. Class	7.81±5.30		8.38±4.85		6.32±4.31	
	3. Class	8.44±5.47		8.21±5.21		5.71±4.30	
	4. Class	8.09±5.19		8.00±4.54		5.27±3.83	
	5. Class	7.81±4.55		7.81±4.30		6.36±4.05	
	6. Class	6.33±4.13		7.50±4.50		5.66±4.63	
Grade Point Average²	<1.50 ^a	7.27±4.46	F=1.874 p=0.097	7.52±4.04	F=1.069 p=0.376	5.38±3.77	F=1.260 p=0.280
	1.50-2.00 ^b	5.66±6.78		6.44±6.52		4.88±5.86	
	2.00-2.50 ^c	9.14±4.41		8.70±4.50		7.02±4.23	
	2.50-3.00 ^d	7.90±5.39		7.88±4.75		5.68±4.18	
	3.00-3.50 ^e	8.27±5.43		8.38±4.78		5.64±4.06	
	3.50-4.00 ^f	7.06±4.17		7.71±4.16		5.27±3.49	
	<1 hour	9.38±7.21		8.15±6.38		4.69±5.94	
	1-2 hour	7.47±5.34		7.80±4.97		5.56±4.47	
Internet usage time²	2-3 hour	8.13±5.05	F=2.227 p=0.050	7.20±4.42	F=1.389 p=0.226	5.74±3.82	F=0.739 p=0.595
	3-4 hour	6.93±4.87		7.47±4.64		5.47±4.17	
	4-5 hour	8.07±4.68		7.79±3.99		5.37±3.30	
	>5 hours	8.70±5.22		8.83±4.66		6.15±4.08	

DASS21 = Depression, Anxiety, Stress Scale,¹t=Independent Sample test, ²F= One Way Analysis of Variance (ANOVA), *p<0.05, ** p<0.001

The comparison of students' sociodemographic characteristics on internet addiction and chronotype was presented in Table 4. No statistically significant difference was found between the total scores of the YIAT-SF and MEQ and the age of students (p>0.05). It was determined that the students' mean score of the YIAT-SF differed according to their class status. In the advanced analysis (Tukey HSD), it was determined that the difference was between individuals studying in the 5th grade and the 1st grade. It was found that the mean score of the YIAT-SF of individuals studying in the 5th grade was significantly higher than that of individuals studying in the 1st grade. Similarly, it was determined that the students' mean score of the YIAT-SF differed according to their grade point average. In the advanced analysis (Tukey HSD), it was determined that the difference was between students whose grade point average was 2.00-2.50 and those whose grade point average was 3.00-3.50. Additionally, there was significance between students whose grade point average was 2.00-2.50 and those whose grade point average was 3.50-4.00. It was determined that the students' mean score of the YIAT-SF and MEQ differed according to their internet usage time (p<0.001) (Table 4).

Table 4

Comparison of Students' Sociodemographic Characteristics on YIAT-SF and MEQ (N=645)

	YIAT-SF		Test Value	MEQ			
	M±SD			M±SD	Test Value		
Gender¹	Female	20,40±11,40	t= -0,392	51,29±9,63	t=-0,275		
	Male	20,02±11,42	p=0.695	51,06±9,74	p=0.783		
Class²	1.Class ^a	18,81±10,51	F=2,423 p=0,034* Differences e>a	51,04±8,35	F=0,304 p=0,910		
	2. Class ^b	21,01±11,70		51,05±10,14			
	3. Class ^c	21,69±10,00		51,83±12,51			
	4. Class ^d	19,91±11,38		51,13±9,47			
	5. Class ^e	29,72±17,29		53,45±5,85			
	6. Class ^f	16,50±11,53		54,33±7,33			
Grade Point Average²	<1.50 ^a	19,06±10,62	F=3,912 p=0,002* Differences c>e, c>f	51,55±7,88	F=1,291 p=0,266		
	1.50-2.00 ^b	19,22±17,94		54,66±9,70			
	2.00-2.50 ^c	26,17±14,22		49,14±14,23			
	2.50-3.00 ^d	20,94±11,14		50,94±10,44			
	3.00-3.50 ^e	20,55±11,33		51,08±9,19			
	3.50-4.00 ^f	17,03±9,57		53,14±8,22			
	<1 hour ^a	14,69±16,27		F=21,713 p=0.000** Differences f>a, c>b, e>b, f>b		50,76±10,14	F=5,887 p=0.000** Differences b>e, b>f, d>f
	1-2 hours ^b	14,42±9,73				53,91±10,12	
2-3 hours ^c	18,79±8,75	51,98±8,98					
3-4 hours ^d	17,77±9,77	52,81±8,72					
4-5 hours ^e	22,79±10,97	49,28±9,69					
>5 hours ^f	27,58±12,79	48,26±10,24					

YIAT-SF=The Short Form of Young's Internet Addiction Test; MEQ= Morningness-Eveningness Questionnaire, ¹t=Independent Sample test, ²F=One Way Analysis of Variance (ANOVA), *p<0.05, ** p<0.001

The correlation between the Depression, Anxiety, Stress Scale (DASS21), Young Internet Addiction Scale- Brief Form, Morning-Evening Questionnaire was presented in Table 5. There was a significant positive and weak relationship between the mean score of the YIAT-SF and the mean score of anxiety (r=0.393; p<0.001), depression (r=.0.424, p<0.001) and stress (r=0.422, p<0.001). Moreover, it was also found that the significant negative and weak relation between the mean score of the MEQ and anxiety (p=-0.146, p<0.001), depression (r=-0.203; p<0.001) and stress (r=-0.180; p<0.001). Similarly, there was a significant negative and weak relationship between the mean score of the YIAT-SF and the mean score of the MEQ (r=-0.289; p=0.000).

Table 5

The Correlations between the mean score of the DASS21, YIAT-SF and MEQ (N=645)

	Anxiety	Depression	Stress	YIAT-SF	MEQ
Anxiety	1	.716**	.763**	.393**	-.146**
Depression		1	.791**	.424**	-.203**
Stress			1	.422**	-.180**
YIAT-SF				1	-.289**
MEQ					1

r= Pearson correlation coefficient, ** p<0.001

Results and Discussion

645 students studying in different departments and classes participated in this study, which examined the relationship between chronotype and depression, anxiety, internet addiction and academic success in university students in the 2022-2023 academic year. For this purpose, the DASS21, YIAT-SF and MEQ were used to evaluate together with the students' gender, age, grade level, departments, behavioral and performance variables and chronotypes. The study results show that there may be variability in students' mood changes, performance tendencies, and some behaviors related to their chronotypes during the education process.

It was found that the majority of the students were neither morning nor evening people and that they chose intermission hours when determining the times when they felt good. It was also determined that approximately 2/3 of the students in the sample were intermediate type, followed by a chronotype moderate morning type, and definite morning type and definite evening type were less common. Similarly, in another study evaluating university students, it was found that 25.14% were moderate morning type, 64.32% were intermediate type, and 10.54% were moderate evening type (Molu et al., 2021). Research indicates that a considerable proportion of university students exhibit evening chronotypes, which can lead to various challenges, including sleep deprivation and poor academic outcomes. A notable percentage of university students, particularly those under 25, identify as having an evening chronotype, which correlates with poor sleep habits and academic performance (Gallego-Gómez et al., 2021). While some studies have observed differences in chronotype based on gender (Jongte & Trivedi, 2022), the role of gender is unclear in this current study. However, it was determined that the chronotype of the students differed according to the duration of their internet use. As students' chronotype shifts to evening type, their internet usage time increases (Vollmer et al., 2012; Tekin, 2021)

When the students' mean score of the DASS21 were examined, it was determined that the students had mild stress level, mild anxiety level and moderate depression level. It was found that students' depression, stress, and anxiety levels varied by gender, and the stress and anxiety levels of female students were higher. Studies on depression and anxiety in the literature have shown that women's anxiety and depression levels are higher (Anlayışlı & Serin 2019; Serin & Aysan, 2021). Although our study found that the depression, anxiety, and stress levels of female students were statistically significant and higher than male students and showed similar results to the literature, one of the limitations of the study is that 70.1% of the students included in the study were female and there were few male participants.

It was observed that the mean score of the YIAT-SF of participants was 20.28±11.39. The lowest possible score on the scale is 12 and the highest score can be 60. Accordingly, it can be said

that students' internet addiction levels are low. Research indicates that university students often exhibit varying levels of internet addiction, which can have significant implications for their mental health and academic performance. For instance, the relationship between internet addiction and sleep quality among adolescents, suggesting that higher levels of internet addiction are associated with poorer sleep outcomes (Çelebioğlu et al., 2020). Similarly, nursing students demonstrated significant levels of internet addiction, which correlated with increased anxiety and stress during the COVID-19 pandemic (Akpınar et al., 2022). This highlights the potential for internet addiction to exacerbate existing mental health issues among students. In addition, it was determined that internet addiction level of the participants differed according to class, grade point average and internet usage duration. It was determined that the mean score of the YIAT-SF was higher in those who 5th grade students compared to 1st grade students; those with a grade point average of 2-2.5 compared to those with a higher-grade point average and as the duration of internet use increased. There are also different studies that support this conclusion and obtain similar results (Demir & Kutlu, 2017). While there are significant differences between internet usage rates and genders in some studies (Balta & Horzum, 2008; Balcı & Gülnar, 2009; Fidancıoğlu et al., 2009; Kelleci et al., 2009), in our study no significant difference was found between internet addiction level and genders. This situation can be explained by the fact that access to the internet has become easy and accessible to people from all walks of life and of all ages. When the studies in the literature are examined, it is stated that there is no significant difference between internet addiction and gender (Lam et al., 2009; Yaygır, 2018; Anlayışlı & Serin, 2019).

When the answers given to the MEQ were evaluated, it was seen that the students with lower scores, in other words, as the chronotype increased towards the evening person, their depression, anxiety and stress levels were higher, and they were more prone to mental problems. Several studies have established a significant association between evening chronotype and increased depressive symptoms. Evening chronotype preferences in young adult college students were linked to increased risks of depression and anxiety, mediated by factors such as daytime sleepiness and sleep debt (Wang et al., 2023). This suggests that the misalignment between biological rhythms and academic schedules may exacerbate mental health issues. Similar studies in the literature also indicate that mental disorders are more common in individuals with an evening chronotype (Kiliç et al., 2019; Huang et al., 2024). Although the study results appear to be compatible with the literature, it has not yet been proven in different population-based studies whether chronotype is a risk factor for mental disorders (Chan et al., 2014; Balta et al., 2021). The evidence suggests that evening chronotypes among university students are at a heightened risk for experiencing depression, anxiety, and stress. Factors such as sleep quality, personality traits, and social jetlag play significant roles in this relationship. Addressing these issues through interventions that promote better sleep hygiene and align academic schedules with students' natural rhythms may help mitigate the negative impacts of chronotype on mental health.

In addition, a weak and positive relationship was detected between the total score of the YIAT-SF and depression, stress and anxiety. In other words, individuals who are prone to internet addiction are also more prone to mental disorders. Research consistently indicates that higher levels of internet addiction correlate with increased psychological distress, highlighting the need for awareness and intervention in this demographic. Similarly, the risk of depression in students with internet addiction was found to be 2.6 times higher than in students without internet addiction (Günay et al., 2018). It was reported that a positive correlation between internet addiction and various psychological issues, including loneliness, depression, anxiety, and stress among university

students in Albania (Hasmujaj, 2021). Students exhibiting signs of potential internet addiction also experienced higher levels of anxiety, stress, and depression (Younes et al., 2016). The prevalence of these mental health issues is significantly greater among students identified as potential internet addicts, suggesting that internet addiction may exacerbate existing psychological conditions. Moreover, studies indicate that internet addiction can lead to social isolation, which may exacerbate feelings of anxiety and depression. For instance, it was reported that students with internet addiction often have weaker social relationships, leading to increased anxiety and emotional distress (Nasiri et al., 2016). This aligns with the self-medication hypothesis which posits that students experiencing mental distress may turn to the internet as a coping mechanism, ultimately leading to addiction (Zenebe et al., 2020). In conclusion, the evidence suggests a strong correlation between internet addiction and increased levels of depression, anxiety, and stress among university students. The cyclical nature of these relationships underscores the importance of addressing internet usage patterns and promoting mental health resources within academic settings. Interventions that focus on reducing internet addiction could play a crucial role in improving the overall well-being of students.

Additionally, a negative relation was found between the participants' chronotype and internet addiction level. It was determined that as the level of internet addiction increased, the total score of the MEQ decreased, in other words, as it shifted towards the evening type, the internet addiction levels increased. The relationship between chronotype and internet addiction among university students has garnered increasing attention in recent research. Chronotype, which refers to an individual's natural preference for being active during certain times of the day, can significantly influence internet usage patterns and, consequently, the risk of developing internet addiction. The study results are compatible with other studies in the literature (Vollmer et al., 2012; Dağ et al., 2022; Karasu et al., 2023). A study indicated that evening chronotypes are more susceptible to internet addiction compared to morning types (Yılbaş & Karadeniz, 2022). Students who identify as evening types tend to engage more frequently in internet activities, particularly during late-night hours, which can lead to problematic usage patterns. Students with moderate to severe internet addiction often used the internet at midnight, exacerbating their addiction and potentially leading to academic and social problems (Abdel-Salam et al., 2019). The tendency for evening chronotypes to engage in late-night internet use may disrupt their sleep patterns, further compounding issues related to mental health and academic performance. The evidence suggests a strong association between chronotype and internet addiction among university students, particularly highlighting the vulnerabilities of evening chronotypes. These students are more likely to engage in late-night internet use, which can disrupt sleep and exacerbate mental health issues such as depression and anxiety. Addressing these issues through targeted interventions that promote healthy internet usage habits and consider individual chronotypes may help mitigate the negative impacts of internet addiction on students' academic and mental well-being.

Limitations of the Study

One of the limitations of the study is that the sample of the research consists only of students studying at Van Yüzüncü Yıl University in the 2022-2023 period and that the participating female students are more than male students. Conducting similar studies by increasing the number of participants of different genders in different regions and different universities can contribute to the field.

Conclusion

In conclusion, this study highlights the intricate relationships between chronotype, internet addiction, depression, anxiety, and academic achievement among university students. The findings indicate that evening chronotypes are more susceptible to internet addiction, which in turn negatively impacts their mental health, leading to increased levels of depression and anxiety. In the current study, it was seen that the internet addiction levels of the participants did not differ in terms of gender, but there was a significant difference between internet usage time and depression level, and as the duration of internet use increased, the academic success rate decreased. Although the participants were generally determined to be intermediate type, it was found that those closer to the evening type had higher levels of depression anxiety and stress. Given these findings, it is crucial for educational institutions to implement targeted interventions that address the unique challenges faced by evening chronotypes and those exhibiting signs of internet addiction. By fostering a supportive environment that promotes healthy internet usage and mental well-being, universities can enhance academic outcomes and overall student success. Future research should continue to explore the mechanisms underlying these relationships to develop effective strategies for mitigating the adverse effects of internet addiction and mental health issues on academic performance.

Ethics Committee Approval Information: This study approved by Van Yüzüncü Yıl University Non-Interventional Ethics Committee (2023/09-08).

Author Conflict of Interest Information: There is no conflict of interest in this study. This study was supported by TÜBİTAK within the scope of TÜBİTAK 2209-A 2023/1 University Students Research Projects Support Programme (Project Number: 1919B012304237).

Author Contributions: The authors declare that they have contributed equally to the article.

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Geniş Özet

Problem Durumu

Canlıların biyolojik aktiviteleri biyolojik ritim denilen döngülerden oluşmaktadır. Biyolojik ritimler canlıların üreme, beslenme, uyuma gibi periyotlarının zamanlanmasıyla ilgilidir. Bu biyolojik ritimler canlıların içinde yaşadığı çevreye uyum sağlanmasına yarar, örneğin vücut ısısı ve epinefrin düzeyi uyanmadan hemen önce yükselerek yeni güne hazırlanmayı, uyumadan önce de azalarak uykuya dalmayı kolaylaştırır (Aktaş & Özdemir, 2023; Selvi vd., 2011). Canlıların belirli bir ritim dahilinde gerçekleştirdiği yaşamsal faaliyetleri ritmin döngü sürelerine göre kendi aralarında çeşitlenir (Selvi vd., 2011). Sirkadiyen ritim, tüm yaşayan organizmalarda olan, 24 saatlik dilimi içine alan, etrafındaki olası değişikliklere karşı vücudu tetikte tutan biyolojik bir süreci ifade eder. Kişisel sirkadiyen ritim değişiklikleri kronotip ile söylenir (Toktaş & Eskiocak, 2018). Kronotip, bireyin fiziksel ve bilişsel olarak günün aktif olduğu dönemini gösterir (Sertçelik, 2016; Tekin, 2021). Kronotip genetik ve biyolojik temele dayanmakla birlikte sosyo-demografik özellikler, psikososyal ve coğrafik faktörlerden de etkilenmektedir. Genellikle erkeklerin kadınlara kıyasla daha akşamcıl tipte olduğu bilinmektedir. En yaygın görülen kronotipi ara tip iken, en az görülen kronotip ise akşamcıl tiptir. Yıllar ilerledikçe sabahçıl tipe eğilim artmakta, yeni doğan ve çocukluk döneminde sabahçıl tip, ergenlik ve genç erişkinlik dönemlerinde ise akşamcıl tip daha sık görülmektedir (Zimmermann, 2011). Yapılan araştırmalarda akşamcıl tip en yaygın olarak 15-25 yaş aralığında görülmekte ve ilerleyen zamanda sabahçıl kronotip ağırlık kazanmaktadır (Randler, 2016). Yapılan çalışmalarda akşamcıl tipler sabahçıl tiplere göre, daha fazla sigara, alkol, kafeinli içecek tüketimi, sağlıksız beslenme alışkanlıkları, depresif ruh hali, daha fazla stres, düzensiz yaşam tarzı ve duygusal istikrarın daha düşük olması gibi sağlıkla ilgili yaşam kalitesi göstergelerinde daha olumsuz sonuçlara sahiptir (Blachnio vd., 2015; Kiliç vd., 2019). Anksiyete, depresyon belirtileri ve madde kötüye kullanımı akşam aktif tip gençlerde fazla görülmektedir (Erdoğan vd., 2022). Anksiyete, depresyon, bipolar ve psikoz hastalarında yapılan çalışmalarda bu bireylerin daha fazla akşamcıl kronotipe sahip olduğu görülmüştür. Akşamcıl kronotip, kısa uyku

süresi, yetersiz uyku ve kötü uyku kalitesi ile ilişkilendirmekte ve yetersiz uyku, olumsuz duygu duruma ve olumsuz duygularla başa çıkabilme yeteneğinin azalmasına neden olmaktadır (Selvi vd., 2011). Akşamcıl kronotipteki bireyler gündelik yaşama daha zor adapte olmakta ve sabahçıl kronotipteki bireylere kıyasla daha fazla psikiyatrik sorunla karşılaşmaktadırlar. Örneğin akşamcıl kronotipteki bireylerin duygusal ve bilişsel olarak (Roeser vd., 2013), depresif semptom ve akademik başarısızlık yönünden daha riskli oldukları bilinmektedir. Ayrıca akşamcıl tiplerin depresyon semptomlarının daha ciddi olduğu belirtilmektedir. Özetle bireylerin kronotip özellikleri gündelik adaptasyon sorunlarından çeşitli psikopatolojilere kadar oldukça geniş bir alanda yaşamlarını etkileme potansiyeline sahiptir (Blachnio vd., 2015; Zimmermann, 2011)

Tüm bu literatür ışığında bu araştırma, günün farklı saatlerinde okula giden üniversite öğrencilerinde kronotip özelliklerinin belirlenmesi ve ilişkili olabilecek anksiyete, depresyon, internet bağımlılığı gibi ruh sağlığı sorunları ve akademik başarı düzeyini incelemek amacıyla planlanmıştır.

Yöntem

Tanımlayıcı ve ilişkisel desende yürütülen bu çalışma basit rastgele örnekleme yöntemiyle ulaşılan 645 üniversite öğrencisi ile gerçekleştirildi. Veriler Eylül 2023- Ocak 2024 tarihleri arasında Öğrencilerin Tanıtıcı Özelliklerine Yönelik Bilgi Formu, Depresyon, Anksiyete, Stres Ölçeği, Young İnternet Bağımlılığı Ölçeği ve Sabahçıl-Akşamcıl Anketi (SAKCA) kullanılarak toplanmıştır.

Veriler, SPSS programı kullanılarak değerlendirildi. Kullanılan verilerin normal dağılıma uygunluğu çarpıklık ve basıklık (skewness ve kurtosis) değerleri kapsamında değerlendirilmiştir. Basıklık ve çarpıklık değerinin ± 3 arasında olması normal dağılımı göstermektedir (Shao, 2002). Veriler; tanımlayıcı istatistikler, Cronbach's Alpha, Pearson Korelasyon ve homojenlik testlerine göre iki ortalama arasındaki farkın önemlilik testleri kullanılarak değerlendirilmiştir. Çalışmaya Van Yüzüncü Yıl Üniversitesi Girişimsel Olmayan Etik Kurulundan etik kurum izni ve Van Yüzüncü Yıl Üniversitesi Rektörlüğü'nden kurum izni alındıktan sonra başlanmıştır. Ayrıca çalışmada kullanılacak ölçekler için geçerlik güvenirliğini yapan yazarlardan e posta yolu ile kullanım izni alınmıştır. Katılımcıların çalışma öncesi bilgilendirilip yazılı ve sözlü onamları da alınmıştır.

Bulgular

Öğrencilerin yaş ortalaması 21,68 yıl olup, %70,1' i kadın ve %97,8'i bekar olduğu bulunmuştur. Öğrencilerin %75,3'ü çekirdek ailede yaşamakta, %43,7'si 4. sınıf öğrencilerinden oluşmaktadır. Öğrencilerin orta düzeyde depresyon, hafif düzeyde stres, hafif orta düzeyde anksiyete yaşadıkları saptanmıştır. Öğrencilerin ortalama internet kullanıcısı oldukları belirlendi. Sabahçıl-Akşamcıl Anketi toplam puan ortalamasının $51,22 \pm 9,66$ olduğu ve ara tip olarak değerlendirilebilecekleri saptanmıştır.

Öğrencilerin sosyo-demografik özelliklerine göre yapılan analizlerde, DASS toplam puan ortalamaları ve alt boyut puan ortalamalarının; sınıf, akademik ortalama, internet kullanma durumu gibi özellikler arasındaki fark istatistiksel açıdan anlamlı bulunmamıştır ($p > 0,05$). Kadın öğrencilerin Stres alt boyutu puan ortalaması ile Anksiyete alt boyut puan ortalaması arasındaki farkın erkek öğrencilere göre istatistiksel açıdan anlamlı ve yüksek olduğu saptanmıştır ($p < 0,05$). Öğrencilerin sosyodemografik özelliklerine göre, Young İnternet Bağımlılığı Ölçeği (YİBÖ) toplam puan ortalamaları ve SAKCA puan ortalamalarının yaş ile arasında istatistiksel olarak

anlamli fark olmadığı saptanmıştır ($p>0,05$). Öğrencilerin sınıf durumları incelendiğinde, 5. Sınıfta okuyan bireylerin YİBÖ toplam puan ortalamasının 1. Sınıfta okuyan bireylere kıyasla daha yüksek ve anlamlı olduğu saptanmıştır. Yapılan ileri düzey analizde aradaki farkın 5.sınıf ve 1.sınıfta okuyan bireyler arasında olduğu belirlenmiştir ($p<0,05$).

Öğrencilerin akademik ortalarına göre, YİBÖ toplam puan ortalamalarının istatistiksel açıdan anlamlı olduğu görülmüştür ($p<0,05$). Öğrencilerin internet kullanma durumları incelendiğinde; YİBÖ toplam puan ve SAKCA toplam puan ortalamalarında anlamlı sonuçlar aldıkları saptanmıştır ($p<0,001$). Young ölçeği toplam puanında, 5 saat ve üzerinde internet kullanan öğrencilerin 1-2 saat ile 1 saat ve altında internet kullanan öğrencilere göre daha yüksek puanlar aldıkları belirlenmiştir. Ayrıca, 4-5 saat internet kullanan öğrencilerin de YİBÖ toplam puanları 1-2 saat ve 1 saat ve altında internet kullananlara göre daha yüksek ve anlamlı olduğu bulunmuştur.

YİBÖ toplam puan ortalaması ile depresyon, stres, anksiyete düzeyleri arasında pozitif yönde, zayıf ve anlamlı bir ilişki olduğu bulunmuştur ($p<0,001$). Ayrıca YİBÖ toplam puan ortalaması ile Sabahçıl-Akşamcıl anketi puanı arasında zayıf düzeyde negatif yönde bir ilişki olduğu bulunmuştur. Benzer şekilde Sabahçıl-Akşamcıl anketi puanı ile depresyon, stres, anksiyete düzeyleri arasında zayıf düzeyde negatif yönde bir ilişki olduğu bulunmuştur.

Sonuç ve Tartışma

Yapılan çalışma kronotiplerin öğrencilerin ruh sağlığı ve internet bağımlılığına yatkınlığı ile yakından ilişkili olduğunu ve internet bağımlılığının akademik başarı üzerinde önemli bir rol oynadığını göstermektedir. Araştırma da örnekleme oluşturan öğrencilerin internet bağımlılık düzeylerinin cinsiyetleri açısından anlamlı farklılık olmadığı, ancak internet kullanımı ve depresyon düzeyleri arasında anlamlı farklılık olduğu görülmüş, internet kullanım süresi artıçça akademik başarı oranının da düştüğü görülmüştür. Genel olarak katılımcılar ara tip olarak belirlensede sabahçıl akşamcıl anketinde daha yüksek puan alarak akşamcıl tipe daha yakın olanların depresyon, anksiyete düzeylerinin de daha yüksek olduğu ve burada cinsiyetler arası anlamlı bir farklılık olduğu, kız öğrencilerin erkek öğrencilere oranla depresyon, anksiyete ve stres düzeylerinin daha yüksek olduğu görülmüştür. Bu çalışmadan elde edilen bulgulara dayalı olarak üniversite öğrencilerinde kaygıyı azaltmaya yönelik çalışmalar, farklı kronotiplerde gelişebilen ve gelişebilecek ruhsal sorunların belirlenerek müdahale programlarının oluşturulmasına yönelik çalışmalar, kadın öğrencilerin depresyon, anksiyete, stres düzeylerinin erkek öğrencilere göre daha yüksek olmasının nedenlerini araştırıp sorunların çözümüne yönelik yeni çalışmalar yapılabilir.