

# Critical Role of Sleeping and Eating Habits on Academic Success among Dormitory Residing University Students

## Yurtta Kalan Üniversite Öğrencilerinin Uyku ve Yeme Alışkanlıklarının Akademik Başarı Üzerindeki Kritik Rolü

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### ABSTRACT

Objective University dormitories play a crucial role in shaping students' overall health, which is essential for their academic success. Current university dormitories, understanding the impact of living conditions on students' overall health is crucial for guiding their academic success.

Method: This study was designed as a cross-sectional exploratory research. The sample of the study consisted of 627 students, with 331 males and 296 females. Data for the study were collected using the Personal Information Form, Richards-Campbell Sleep Questionnaire, Pittsburgh Sleep Quality Index, and Adult Eating Behavior Questionnaire.

Results: The gender distribution among the participating students was balanced, with a mean age of  $20.98 \pm 1.680$  years and predominantly medium to low income levels. When examining the average scores of RCSQ, AEBQ, and PSQI scales, it was found that the "RCSQ" average is below the poor and moderate range ( $46.443 \pm 28.290$ ). While male students had higher overall sleep scores indicating poorer sleep quality compared to females, the sleep quality index scores were higher among females, indicating better sleep quality. Generally, the average sleep score among students was  $46.443 \pm 28.290$ , which is considered to be at a poor level. The students' total average score on the Adult Eating Behavior Scale was determined to be  $90.893 \pm 17.019$ , indicating a high average score and suggesting negative eating behaviors among them. Students' average sleep quality was also found to be  $5.096 \pm 2.927$ , indicating poor sleep quality. According to correlation analysis, poor eating behavior negatively affects sleep quality and overall sleep, and academic performance is also influenced by eating behavior.

Conclusion: Sleep quality, eating behaviors, and healthy lifestyle behaviors have significant effect on academic performance and quality of life.

**Keywords:** Academic performance, quality of life, sleep, university students, eating habits

### ÖZ

Amaç: Günümüz üniversite yurtlarında, yaşam koşullarının öğrencilerin genel sağlığı üzerindeki etkilerini anlamak, onların akademik başarılarını yönlendirmek açısından önemlidir. Bu doğrultuda, bu çalışma, yurtta kalan üniversite öğrencilerinin yeme alışkanlıkları, uyku düzenleri ve akademik performansları arasındaki ilişkileri araştırmak amacıyla planlanmıştır.

Yöntem: Bu çalışma ilişki arayıcı kesitsel tipte tasarlanmıştır. Çalışmanın örneklemini 331'i erkek, 296'sı kadın olmak üzere 627 öğrenci oluşturmuştur. Çalışmanın verileri Kişisel Bilgi Formu, Richards-Campbell Uyku Anketi, Pittsburgh Uyku Kalite İndeksi ve Yetişkin Yeme Davranışı Ölçeği uygulanarak toplanmıştır.

Bulgular: Çalışmaya katılan öğrencilerin cinsiyet dağılımının dengeli olduğu, orta ya da düşük düzey gelir düzeyine sahip oldukları ve ortalama yaşlarının  $20,98 \pm 1,680$  olduğu belirlenmiştir. Erkek öğrencilerin genel uyku puanlarının kötü olsa da kadınlardan daha yüksek olduğu ancak kadınların uyku kalitesi indeksinin daha iyi olduğu uyku kalitesi indeksi puanlarının erkeklerde daha yüksek olduğu saptanmıştır. Genel olarak öğrencilerin uyku puan ortalamasının  $46,443 \pm 28,290$  kötü düzeyde sayılacak oranda düşük olduğu saptanmıştır. Öğrencilerin yetişkin yeme davranışı toplam ortalaması  $90,893 \pm 17,019$  olarak saptanmış ve yeme davranışı puanlarının ortalamasının yüksek olduğu, olumsuz yeme davranışına sahip oldukları bulunmuştur. Öğrencilerin uyku kalitesi ortalamasının da  $5,096 \pm 2,927$  olduğu ve zayıf uyku kalitesine sahip oldukları saptanmıştır. Korelasyon analizine göre yeme davranışının kötü olmasının uyku kalitesini ve genel uykuyu olumsuz etkilediği ve akademik başarının yeme davranışından da etkilendiği bulunmuştur.

Sonuç: Uyku kalitesinin, yeme davranışlarının ve sağlıklı yaşam tarzı davranışlarının akademik performans ve yaşam kalitesi üzerinde önemli etkileri bulunmaktadır.

**Anahtar sözcükler:** Akademik performans, yaşam kalitesi, uyku, üniversite öğrencileri, yeme alışkanlıkları

## Introduction

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Students' academic success is a significant indicator of changes in their cognitive abilities and behaviors. Academic achievement is influenced by various factors, including physical and mental health, cognitive abilities, emotional characteristics, socioeconomic status, peer environment, family structure, the quality of educational services, the opportunities provided by the university, motivation level, and career choice (Ekenler and Altinel 2021). In higher education, academic success is a cornerstone of university students' adaptation to university life. Various social, academic, and economic factors significantly impact student performance. Factors such as cognitive abilities, study habits, relationships with faculty, new environments, accommodation, dormitory conditions, age, gender, economic status, culture, social elements, education curriculum, existing regulations, and current examination systems can all influence academic success. When the educational process and exam preparations are effectively managed, they can enhance academic achievement. Conversely, poor management of these processes can increase stress and health issues, negatively affecting academic performance (Wu and Zhang 2023). Therefore, students' academic success is related to various lifestyle choices that can influence their physiological factors such as nutritional status, physical activity duration, and sleep patterns, as well as their psychosocial conditions like behaviors, attitudes, and perceptions (Suna and Özer 2021). In student dormitories, which are communal environments, common issues such as sleep patterns and nutrition significantly impact academic performance. For students residing in rooms with 4-6 occupants, sleep quality can be affected by environmental factors, individual habits, dietary practices, room characteristics, and stress levels. The university period, characterized by increased autonomy in areas such as separating from family, decision-making, and personal choice, represents a significant transition. However, this transition can negatively affect sleep quality (Peltzer and Pengpid 2015).

Academic performance influenced negatively by poor sleep quality that by causing cognitive dysfunction (Aydın 2020). Students with poor sleep quality may also experience disrupted eating habits, often skipping breakfast and turning to fast food instead of healthier options, which can lead to various health issues (Reche-García et al. 2022). Furthermore emotional changes and poor sleep hygiene can further affect food consumption, leading to increased intake of certain food groups (Şen and Kabaran 2021). Nutrition is a complex interplay of physiological, psychological, sociological, and economic factors, and balanced nutrition is crucial for health and quality of life (Şahin et al. 2020, Barragán et al. 2023). Disrupted eating behaviors among students, characterized by inadequate nutrition, obesity, eating disorders, chronic diseases, and psychological issues, can lead to health complications. Poor eating habits, exacerbated by the intake of low-nutrient foods such as fast food, sugary drinks, and processed snacks, are linked to lower academic performance (Batayneh 2023).

University students' lifestyles, physical characteristics, health, environment, social and economic conditions, culture, and policies all influence their dietary choices and academic success. Research highlights how students' eating patterns, food choices, meal schedules, and nutrition knowledge affect cognitive performance. Improving sleep quality has been shown to enhance cognitive performance and academic success, underscoring the importance of holistic health management for students. In today's university dormitories, understanding the impacts of living conditions on students' overall health is crucial for guiding their academic success. Upon reviewing the current literature, it is observed that there is a lack of research that simultaneously investigates the effects of multiple sleep-related variables (such as sleep experience, sleep hygiene, and sleep quality) and eating behaviors on academic success among students living in dormitories. Accordingly, this study aims to investigate the relationships between eating habits, sleep patterns (sleep experience and sleep hygiene), and academic performance among university students residing in dormitories. Our research questions are as follows: What are the eating behaviors, sleep quality, and academic performance levels of students living in university dormitories? Is there a significant relationship between eating behaviors, sleep quality, and academic performance?

## Method

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### Sample

The study population consisted of 2.900 male and 1.000 female students enrolled at Bartın University and residing in the Credit and Dormitories Institution (KYK) during the academic year 2023-2024. The students included in the study were selected impartially using a stratified sampling method, based on the criteria of being enrolled at Bartın University and residing in university-affiliated dormitories. The sample size was determined by calculating the sample size in known groups of the population, stratifying by gender, and was established as 333 male and 278 female students with a 95% confidence level and 5% margin of error. To reduce possible data

losses and achieve the targeted sample size, sampling was planned to include 350 male and 300 female students. The study sample ultimately comprised 331 male and 296 female students, totaling 627 participants. The study included students aged 18 and over who are enrolled in associate or undergraduate programs at Bartın University and reside in KYK dormitories, provided they do not have issues with verbal communication. Students who did not meet these criteria were excluded from the data collection process by the researchers. There were no participants who agreed to participate but were excluded during the form-filling process due to not meeting the criteria.

## **Procedure**

This study was designed as a cross-sectional correlational study. The study obtained written permission from the Bartın University Social and Humanities Sciences Ethics Committee (date: 30.01.2024, protocol no: 2023-SBB-0880). Participants were informed that the data collected for this study would be kept confidential and used solely for research purposes, in accordance with ethical standards. They were also assured that participation in this research was voluntary. Short informative details about the research topic and purpose were provided, and participants were asked to approve the informed consent form. Only participants who consented went to the next stage of the online form and answered the questions. This ensured written consent was obtained from all study participants.

This research was conducted between February 12, 2024, and March 11, 2024, among students enrolled at Bartın University and residing in university dormitories. After obtaining ethical committee approval, student consents were obtained both in writing and verbally, and the data collection form and scales were administered on a voluntary basis. During the data collection phase, online forms and scales developed by the researchers were implemented by having participants scan the QR code with their phones. Due to the large sample size and an environmentally friendly approach, the data collection forms and scales were organized as online forms to reduce paper consumption. However, the data were collected face-to-face by the researchers directly from the participants.

## **Measures**

Research data were collected using the Personal Information Form, Richards-Campbell Sleep Questionnaire, Pittsburgh Sleep Quality Index (PSQI) and Adult Eating Behavior Questionnaire (AEBQ).

### ***The Personal Information Form***

The Personal Information Form was designed by the researchers to collect participants' personal and environmental characteristics for the study. It consists of a total of 8 questions that include information such as the participants' age, gender, education level, class year, academic grade point average, and income status.

### ***Richards-Campbell Sleep Questionnaire***

The Richards-Campbell Sleep Questionnaire (RCSQ), developed by Richards in 1987, is a scale used to evaluate various aspects of night sleep. It was adapted into Turkish by Karaman Özlü and Özer in 2015 (Karaman Özlü and Özer 2015). This scale includes six different criteria such as depth of sleep, time to fall asleep, frequency of awakening, duration of wakefulness, quality of sleep and environmental noise level. For each criterion, evaluation is made using an evaluation score between 0 and 100. The scoring system provides a criterion in which scores between "0-25" represent very poor sleep and values between "76-100" represent very good sleep. The total score of the scale is evaluated over 5 items, and the 6th item, which measures the environmental noise level, is excluded from the total score evaluation. As the RCSQ score increases, patients' sleep quality tends to improve (Richards 1987). The scale's Cronbach's Alpha value was found to be 0.91 (Karaman Özlü and Özer 2015). In our study, Cronbach's  $\alpha$  value was calculated as 0.845.

### ***Pittsburgh Sleep Quality Index***

The Pittsburgh Sleep Quality Index (PSQI), developed by Buysse et al. in 1989, was adapted into Turkish by Ağargün et al. in 1996. PSQI is designed to quantitatively assess sleep quality. It consists of a total of 24 questions, with 19 based on self-assessment and 5 answered by either a partner or roommate. In the scoring process, questions answered by the individual's partner or roommate are not considered. The self-assessment questions by the individual include factors such as current sleep duration, sleep latency (delay in falling asleep), and the frequency/duration/severity of specific sleep-related problems. The total of 18 questions is grouped into seven component scores, obtained by grouping one or more items. Each item is rated on a scale of 0 to 3. These

factors include: 1. Individual sleep quality, 2. Sleep onset latency, 3. Sleep duration, 4. Typical sleep efficiency, 5. Sleep disturbances, 6. Use of sleep medication, 7. Daytime dysfunction. The sum of these seven factor scores forms the overall index score, which ranges from 0 to 21. PSQI index score above five indicates poor sleep quality, although it does not indicate the presence or prevalence of sleep disorders. The scale's Cronbach's Alpha value was found to be 0.80 (Ağargün and Kara 1996). The scale was originally developed to assess the sleep quality of patients, but it is currently being used on students (Ekenler and Altınel 2021). In our study, Cronbach's  $\alpha$  value was calculated as 0.749.

### ***Adult Eating Behavior Questionnaire***

The Turkish adaptation of the 'Adult Eating Behavior and its Relationship with Body Mass Index (BMI): Adult Eating Behavior Questionnaire (AEBQ)' was developed by Yücel et al. (2022) to assess eating behaviors in adults. The scale consists of 26 items organized into 7 factors. The reliability analysis yielded a Spearman Brown coefficient of 0.71 using the split-half method. Additionally, the Cronbach's  $\alpha$  value was calculated as 0.76. The AEBQ includes 3 items in the pleasure of eating dimension, 5 items in emotional overeating, 5 items in emotional undereating, 5 items in food selectivity, 4 items in food responsiveness, 4 items in slow eating, 5 items in hunger, and 4 items in fullness dimensions. The Turkish adaptation of AEBQ has been determined to be a valid, reliable, and useful scale for understanding and assessing eating behaviors (Yücel et al. 2022). In our study, Cronbach's  $\alpha$  value was calculated as 0.924.

### **Statistical Analysis**

The data obtained in the study were analyzed using IBM SPSS Statistics for Windows, Version 22.0 (SPSS INC., Chicago, IL, USA). Frequency and percentage analyses were conducted to determine the demographic characteristics of the students participating in the research. Mean and standard deviation statistics were used to evaluate the scale. Kurtosis (flatness) and skewness (asymmetry) values were examined to determine whether the research variables exhibited a normal distribution. It was determined that the variables showed normal distribution. Parametric methods were employed for data analysis. The relationships between dimensions determining the scale levels of students were examined using Pearson correlation analysis. Independent samples t-test, one-way analysis of variance (ANOVA), and post hoc (Tukey, LSD) analyses were used to examine differences in scale levels based on students' descriptive characteristics. Cohen's d and Eta squared ( $\eta^2$ ) coefficients were used to calculate effect sizes. Effect size indicates whether the differences between groups are significantly large. Cohen value is evaluated as 0.2: small; 0.5: medium; 0.8: large, eta square value is evaluated as 0.01: small; 0.06: medium; 0.14: large (Büyüköztürk et al. 2018).

### **Results**

When examining the distribution of students according to descriptive characteristics; 331 (52.8%) are male, and 296 (47.2%) are female. 98.9% of the students are single, 67.3% are undergraduate students, and 95.7% are not employed. The monthly income level of the students is distributed equivalently to expenses at a rate of 52%. The average "age" of the students is  $20.980 \pm 1.680$  (Min=18; Max=28), and the average "academic grade point average" is  $2.897 \pm 0.472$  (Min=1.3; Max=4.5) (Table 1).

When examining the average scores of RCSQ, AEBQ, and PSQI scales, it was found that the "RCSQ" average is below the poor and moderate range ( $46.443 \pm 28.290$ ). Students' "AEBQ" average is  $90.893 \pm 17.019$ , "hunger" average is  $14.147 \pm 3.117$ , "food selectivity" average is  $11.118 \pm 2.560$ , "emotional overeating" average is  $15.512 \pm 5.499$ , "emotional undereating" average is  $17.175 \pm 4.639$ , "satiety feeling" average is  $9.909 \pm 2.699$ , "slow eating" average is  $10.410 \pm 2.741$ , "enjoyment of eating" average is  $12.622 \pm 2.319$ , indicating high average scores in eating behaviors and tendencies towards negative eating behaviors. Students' "PSQI" average is also found to indicate poor sleep quality at  $5.096 \pm 2.927$  (Table 2).

According to the findings of correlation analyses examining the relationships between RCSQ, AEBQ, PSQI scores, and academic grade point average: there is a negative very weak correlation between AEBQ and RCSQ ( $r = -0.152$ ,  $p = .0001$ ). A positive weak correlation is observed between PSQI and RCSQ ( $r = 0.487$ ,  $p = .0001$ ), indicating that sleep quality and eating behavior are negatively correlated ( $r = -0.147$ ,  $p = .0001$ ), and a negative very weak correlation is found between academic grade point average and eating behavior ( $r = -0.079$ ,  $p = .047$ ). It has emerged that poor eating behavior adversely affects sleep quality and overall sleep. Additionally, academic performance is influenced by eating behavior. The correlation relationships between other variables are not statistically significant ( $p > 0.05$ ) (Table 3).

Variables	Frequency (n)	Percentage (%)
Gender		
Male	331	52.8
Female	296	47.2
Marital status		
Single	620	98.9
Married	7	1.1
Educational status		
Bachelor's degree student	422	67.3
Associate's degree student	205	32.7
Employment status		
Yes	27	4.3
No	600	95.7
Monthly income level		
Income less than expenditure	230	36.7
Income more than expenditure	71	11.3
Income equal than expenditure	326	52.0
	Mean	SD
Age	20,980	1.680
Academic grade average	2,897	0.472

	N	Mean	SD	Min.	Max.
Richards-Campbell Sleep Questionnaire	627	46.443	28.290	0.000	100.000
Adult Eating Behavior Questionnaire	627	90.893	17.019	26.000	130.000
Hunger	627	14.147	3.117	4.000	20.000
Food Selectivity	627	11.118	2.560	3.000	15.000
Emotional Overeating	627	15.512	5.499	5.000	25.000
Emotional Undereating	627	17.175	4.639	5.000	25.000
Satiety Feeling	627	9.909	2.699	3.000	15.000
Slow Eating	627	10.410	2.741	3.000	15.000
Eating Pleasure	627	12.622	2.319	3.000	15.000
Pittsburgh Sleep Quality Index	627	5.096	2.927	0.000	14.000

		Richards Campbell Sleep	Adult Eating Behavior	Pittsburgh Sleep Quality	Academic Grade Average
Richards Campbell Sleep	r	1.000			
	p	0.000			
Adult Eating Behavior	r	-0.152**	1.000		
	p	0.000	0.000		
Pittsburgh Sleep Quality	r	0.487**	-0.147**	1.000	
	p	0.000	0.000	0.000	
Academic Grade Average	r	0.068	-0.079*	0.029	0.125**
	p	0.087	0.047	0.466	0.002

\* $<0.05$ ; \*\* $<0.01$ ; Pearson Correlation Analysis

When examining the differentiation of RCSQ scores and PSQI scores based on descriptive characteristics: It was found that RCSQ scores were significantly higher in males ( $M = 49.592$ ) compared to females ( $M = 42.922$ ) ( $t = 2.965$ ;  $p = .003$ ;  $d = 0.237$ ;  $\eta^2 = 0.014$ ). Similarly, sleep quality scores were significantly higher in males ( $M = 5.414$ ) compared to females ( $M = 4.740$ ) ( $t = 2.895$ ;  $p = .004$ ;  $d = 0.232$ ;  $\eta^2 = 0.013$ ). Associate's degree students'

RCSQ scores ( $M = 37.971$ ) were found to be significantly lower compared to bachelor's degree students' scores ( $M = 50.559$ ) ( $t = -5.340$ ;  $p < .05$ ;  $d = 0.455$ ;  $\eta^2 = 0.044$ ). Similarly, sleep quality scores ( $M = 4.702$ ) were lower in associate's degree students compared to bachelor's degree students ( $M = 5.287$ ) ( $t = -2.353$ ;  $p = .026$ ;  $d = 0.200$ ;  $\eta^2 = 0.009$ ). Students' RCSQ scores show significant differences based on their class level ( $F = 6.177$ ;  $p < .05$ ;  $\eta^2 = 0.029$ ). The reason for this difference is that the scores of both third and fourth-year students are higher than those of both first and second-year students ( $p < .05$ ) (Table 4).

Students' RCSQ scores show significant differences according to monthly income level ( $F = 10.166$ ;  $p < .05$ ;  $\eta^2 = 0.032$ ). The reason for this difference is that the scores of students whose income matches their expenses and those whose income exceeds their expenses are higher than those whose income is less than their expenses ( $p < .05$ ). Students' sleep quality scores also show significant differences according to monthly income level ( $F = 10.000$ ;  $p < .05$ ;  $\eta^2 = 0.031$ ). The reason for this difference is that the sleep quality scores of students whose income matches their expenses are higher than those whose income is less than their expenses ( $p < .05$ ). Students' RCSQ scores and PSQI scores do not show significant differences according to marital status and employment status; PSQI scores do not vary significantly by class ( $p > .05$ ) (Table 4).

<b>Table 4. Differentiation of Richards Campbell Sleep Scores and Pittsburgh Sleep Quality scores by descriptive characteristics</b>			
<b>Demographic Characteristics</b>	<b>n</b>	<b>RCSQ (Mean±SD)</b>	<b>PSQI (Mean±SD)</b>
<b>Gender</b>			
Male	331	49.592±25.434	5.414±2.728
Female	296	42.922±30.840	4.740±3.101
t		2.965	2.895
p		0.003	0.004
<b>Marital Status</b>			
Married	7	44.429±22.832	4.429±4.077
Single	620	46.466±28.360	5.103±2.915
t		-0.189	-0.606
p		0.850	0.545
<b>Educational Status</b>			
Bachelor's degree student	205	37.971±29.966	4.702±3.189
Associate's degree student	422	50.559±26.514	5.287±2.775
t		-5.340	-2.353
p		0.000	0.026
<b>Grade</b>			
1	213	44.399±27.874	5.127±2.936
2	214	42.061±28.073	4.808±2.946
3	100	53.760±25.517	5.150±2.925
4	100	52.860±30.066	5.590±2.839
F		6.177	1.662
p		0.000	0.174
PostHoc*		3>1, 4>1, 3>2, 4>2	
<b>Employment Status</b>			
Yes	27	49.296±26.368	5.444±2.636
No	600	46.315±28.387	5.080±2.941
t		0.535	0.633
p		0.593	0.527
<b>Monthly Income Level</b>			
Income Less Than Expenditure	230	39.861±28.896	4.470±2.978
Income Equal to Expenditure	326	50.454±27.987	5.574±2.818
Income More Than Expenditure	71	49.352±23.736	4.930±2.890
F		10.166	10.000
p		0.000	0.000
PostHoc*		2>1, 3>1	

F: ANOVA Test; t: Independent Groups T-Test; PostHoc: Tukey, LSD; \* $p < 0.05$

<b>Table 5. Differentiation of Adult Eating Behavior scores by descriptive characteristics</b>										
<b>Demographic Characteristics</b>		<b>n</b>	<b>Adult Eating Behavior Mean±SD</b>	<b>t/p</b>	<b>Hunger Mean±SD</b>	<b>t/p</b>	<b>Food Selectivity Mean±SD</b>	<b>t/p</b>	<b>Emotional Overeating Mean±SD</b>	<b>t/p</b>
Gender	Male	331	90.468±15.321	-0.661 0.514	14.281±2.808	1.141 0.260	11.051±2.268	-0.689 0.496	16.006±4.671	2.388 0.019
	Female	296	91.368±18.751		13.997±3.427		11.193±2.852		14.960±6.260	
Marital Status	Married	7	97.714±13.487	1.067	15.714±2.984	1.339 0.181	10.429±3.952	-0.716 0.474	16.857±5.273	0.651 0.516
	Single	620	90.816±17.048	0.287	14.129±3.116		11.126±2.543		15.497±5.504	
Educational Status	Associate's degree student	205	93.161±19.404	2.334	14.273±3.507	0.708	11.473±2.831	2.431 0.022	15.361±6.302	-0.479 0.657
	Bachelor's degree student	422	89.792±15.637	0.031	14.085±2.911	0.507	10.946±2.401		15.585±5.070	
Employment Status	Yes	27	90.593±15.599	-0.094	14.630±2.339	0.823	10.037±2.534	-2.251 0.025	15.704±5.790	0.185 0.853
	No	600	90.907±17.092	0.925	14.125±3.147	0.411	11.167±2.552		15.503±5.491	
				F/p		F/p		F/p		F/p
Monthly Income Level	Income < Expenditure	230	93.074±18.892	3.009	14.539±3.395	3.148	11.365±2.842	1.698 0.184	15.726±5.983	0.431 0.650
	Income = Expenditure	326	89.580±16.647	0.050	13.868±3.027	0.044	10.976±2.410		15.316±5.410	
	Income > Expenditure	71	89.859±10.547	PostHoc* 1>2	14.155±2.400	PostHoc* 1>2	10.972±2.210		15.718±4.131	
Grade	1	213	91.211±18.317	0.611	14.216±3.311	0.082	11.155±2.726	0.034 0.992	15.737±5.674	1.436 0.231
	2	214	91.780±18.150	0.608	14.079±3.199	0.970	11.084±2.606		15.897±5.856	
	3	100	89.380±14.352		14.190±2.859		11.090±2.257		14.970±4.650	
	4	100	89.830±13.888		14.100±2.780		11.140±2.408		14.750±5.056	
<b>Demographic Characteristics</b>		<b>n</b>	<b>Emotional Undereating Mean±SD</b>	<b>t/p</b>	<b>Satiety Feeling Mean±SD</b>	<b>t/p</b>	<b>Slow Eating Mean±SD</b>	<b>t/p</b>	<b>Eating Pleasure Mean±SD</b>	<b>t/p</b>
Gender	Male	331	16.589±4.170	-3.374 0.001	9.734±2.524	-1.719 0.088	10.248±2.387	-1.569 0.122	12.559±1.897	-0.720 0.480
	Female	296	17.831±5.039		10.105±2.875		10.591±3.083		12.693±2.717	
Marital Status	Married	7	19.857±5.178	1.540	11.429±3.259	1.499	11.143±1.773	0.711	12.286±2.215	-0.386
	Single	620	17.145±4.628	0.124	9.892±2.691	0.134	10.402±2.749	0.477	12.626±2.322	0.700
Educational Status	Associate's degree student	205	17.971±5.270	3.011	10.268±2.877	2.330	10.917±3.164	3.255	12.898±2.510	2.079
	Bachelor's degree student	422	16.789±4.252	0.005	9.735±2.595	0.025	10.164±2.476	0.003	12.488±2.212	0.047
Employment Status	Yes	27	16.926±4.599	-0.285 0.775	9.704±2.672	-0.404 0.686	10.519±2.637	0.210 0.833	13.074±1.662	1.035 0.301
	No	600	17.187±4.644		9.918±2.703		10.405±2.747		12.602±2.344	
				F/p		F/p		F/p		F/p
Monthly Income Level	Income < Expenditure	230	17.791±4.914	3.697	10.209±2.864	2.308	10.587±3.005	0.801	12.857±2.480	2.074

	Income = Expenditure	326	16.923±4.584	0.025	9.758±2.658	0.100	10.288±2.695	0.449	12.451±2.321	0.127
	Income > Expenditure	71	16.338±3.691	PostHoc* 1>2	9.634±2.250		10.394±1.931		12.648±1.631	
Grade	1	213	17.038±4.826	0.679	9.873±2.784	1.196	10.516±2.764	0.997	12.676±2.442	1.215
	2	214	17.528±4.721		0.565		10.094±2.743		0.310	
	3	100	16.830±4.139	10.010±2.285		9.990±2.393	12.300±2.072			
	4	100	17.060±4.546	9.490±2.794		10.380±2.518	12.910±1.798			

F: ANOVA Test; t: Independent Groups T-Test; PostHoc: Tukey, LSD; \* $p < 0.05$

When examining the descriptive characteristics of AEBQ total and subscale scores: It was found that men's emotional overeating scores were significantly higher than women's scores ( $t = 2.388$ ;  $p = .019$ ;  $d = 0.191$ ;  $\eta^2 = 0.009$ ), whereas their emotional under-eating scores were significantly lower ( $t = -3.374$ ;  $p = .001$ ;  $d = 0.270$ ;  $\eta^2 = 0.018$ ). Students' AEBQ total and scores for hunger, food selectivity, satiety, slow eating, and enjoyment of food do not show significant differences by gender ( $p > .05$ ). Associate's degree students' total AEBQ scores ( $t = 2.334$ ;  $p = .031$ ;  $d = 0.199$ ;  $\eta^2 = 0.009$ ) and food selectivity scores ( $t = 2.431$ ;  $p = .022$ ;  $d = 0.207$ ;  $\eta^2 = 0.009$ ) were found to be significantly higher than bachelor's degree students' scores. Additionally, associate's degree students' emotional under-eating scores were significantly higher than those of bachelor's degree students ( $t = 3.011$ ;  $p = .005$ ;  $d = 0.256$ ;  $\eta^2 = 0.014$ ). Associate's degree students' satiety scores ( $t = 2.330$ ;  $p = .025$ ;  $d = 0.198$ ;  $\eta^2 = 0.009$ ), slow eating scores ( $t = 3.255$ ;  $p = .003$ ;  $d = 0.277$ ;  $\eta^2 = 0.017$ ), and enjoyment of food scores ( $t = 2.079$ ;  $p = .05$ ;  $d = 0.177$ ;  $\eta^2 = 0.007$ ) were found to be higher than bachelor's degree students' scores. However, students' hunger and emotional overeating scores did not show significant differences by education level ( $p > .05$ ).

Working students' food selectivity scores were found to be significantly lower than non-working students' scores ( $t = -2.251$ ;  $p = .025$ ;  $d = 0.443$ ;  $\eta^2 = 0.008$ ). However, AEBQ total scores and other subscales did not show significance by employment status ( $p > 0.05$ ). Students' AEBQ total scores ( $F = 3.009$ ;  $p = .05$ ;  $\eta^2 = 0.010$ ) and hunger scores ( $F = 3.148$ ;  $p = .044$ ;  $\eta^2 = 0.010$ ) do show significant differences according to monthly income level. The reason for this difference is that students with income less than expenses have higher total eating behavior scores and hunger scores compared to those whose income matches their expenses ( $p < .05$ ). Additionally, students' emotional under-eating scores show significant differences according to monthly income level ( $F = 3.697$ ;  $p = .025$ ;  $\eta^2 = 0.012$ ). The reason for this difference is that students with income less than expenses have higher emotional under-eating scores compared to those whose income matches their expenses and those whose income exceeds their expenses ( $p < .05$ ). Students' food selectivity, emotional overeating, satiety, slow eating, and enjoyment of food scores do not show significant differences according to monthly income level ( $p > .05$ ). Additionally, students' AEBQ total scores, hunger, food selectivity, emotional overeating, emotional under-eating, satiety, slow eating, and enjoyment of food scores do not show significant differences by marital status and class ( $p > .05$ ) (Table 5).

## Discussion

Academic success in higher education is a fundamental aspect of adapting to university life. When the educational process and exam preparations are managed correctly, it can enhance academic success; conversely, poor management can lead to increased stress and health problems, negatively impacting academic performance (Wu and Zhang 2023). Students' academic success is a measure that shows significant changes in their cognitive abilities and behaviors and is influenced by many factors, such as physical and mental health, cognitive abilities, emotional characteristics, socioeconomic status, peer environment, family structure, the quality of educational services, the opportunities provided by the university, motivation level, and career choice (Ekenler and Altinel 2021). The findings of the current study have been presented and discussed under the established headings, examining the relationships between academic success and the accommodation environment, eating behaviors, sleep patterns, and academic performance within the framework of the studied variables, in light of the current literature.

Students' accommodation environments have a significant impact on their academic success. Çakır et al. (2020) stated that students living in dormitories could more easily meet their physical needs (nutrition, rest, cleanliness, etc.). However, disadvantages such as cramped and crowded rooms in dormitory environments can



lead to negative relationships and poor sleep quality (Yeniçeri et al. 2019, Hacıhasanoğlu Aşıl et al. 2020). This situation can negatively affect the academic success of students living in dormitories. Indeed, research has shown that poor sleep quality and unhealthy eating habits have negative effects on academic motivation and success (Zahedi et al. 2022, Nagorny et al. 2023,). In Aydın's (2020) study, it was reported that 41.1% of students living in university dormitories experienced low sleep quality, and low Pittsburgh Sleep Quality Index (PSQI) scores were negatively associated with high academic self-efficacy scale scores.

Relevant to the findings of a study conducted in Italy, chronic insomnia or poor sleep quality is closely related to daytime sleepiness, academic success, neurocognitive functions, and learning capacity. It has been indicated that low sleep quality frequently negatively affects learning performance (Okano et al. 2019). According to literature reviews studies that support these findings, reveal that students living in dormitories generally have lower sleep quality. In another study, a negative relationship was found between academic grade point average and sleep quality (Ekenler et al. 2021). This situation is associated with the fact that students living in dormitories may have lower sleep quality because they stay in more crowded rooms than other students. The findings of this study showed that students' sleep quality was poor and below average. It was also determined that poor sleep quality reduces students' attention span in classes and their overall academic performance. This confirms that unhealthy sleep habits directly negatively affect academic success. Moreover, although recent literature reviews have discussed the negative effects of staying in crowded dormitory rooms (Yeniçeri et al. 2019, Hacıhasanoğlu Aşıl et al. 2020, Ekenler et al. 2021), no studies were found that specifically classified and compared the number of individuals in these rooms. Additionally, in this study, students residing in dormitories were not grouped based on the number of roommates due to the large sample size. This highlights a gap in the literature, suggesting that future studies should focus on this aspect as well.

Students' eating behaviors also play a crucial role in academic performance. Studies have shown that regular and balanced nutrition is positively associated with academic performance, while unhealthy eating habits are linked to diminished academic motivation and performance (Legget et al. 2023, Vinitchagoon et al. 2023, Breton et al. 2023). Findings from the study by Adıgüzel et al. (2023) reveal that healthy eating impacts academic motivation. In the study by Papadopoulou et al. (2023), nutrition was found to be an important indicator of lifestyle, associated with many factors such as high-quality sleep, an active lifestyle, and good quality of life. Therefore, while the nutrition model alone can influence academic success, it also affects various lifestyle behaviors, thereby impacting overall academic achievement (Papadopoulou et al. 2023). In our recent study, gender and economic status were found to play significant roles. Legget et al. (2023) reported that compared to men, women exhibit greater dietary restrictions, trait-based hunger, disinhibition, eating disorder-related behaviors, depression, stress, and a higher preference for and familiarity with low-calorie foods. In another study, Vinitchagoon et al. (2023) found that individuals who identify as feminine have a lower likelihood of experiencing high risk for eating disorders compared to those who identify as masculine. In another study, gender roles and gender were found to significantly influence the development of eating disorders from a biopsychosocial perspective (Breton et al. 2023). The current study indicated that male students' emotional overeating scores are significantly higher than female students' scores, whereas their emotional undereating scores are lower. This finding reveals that men typically respond to stress or emotional situations by eating more, while women tend to eat less in similar circumstances.

In our study, we examined the effect of students' monthly income levels on their eating behaviors and found that students with higher income levels exhibited healthier eating habits. Additionally, it was found that emotional malnutrition scores differed according to income level, and low-income students' emotional malnutrition scores were higher than other groups. This finding shows that students with low income levels have more difficulty in managing their emotional states, and this is reflected in their eating habits. This finding is further supported by the existing literature. Williams et al. (2022) study stated that high-income individuals consume more fruits, vegetables, and quality protein sources, while low-income individuals tend to consume more processed foods and fast food. The tendency of low income students to adopt unhealthy eating habits is related to economic accessibility and food costs. It has been found that students whose income exceeds their expenses tend to eat healthier and therefore have better general health compared to those whose income is less than their expenses. Another study found that socio-economic status has a significant impact on nutrition quality. It was determined that higher socio-economic groups comply with dietary recommendations better, consume more diverse diets, and consume more recommended foods (Alkerwi et al. 2015). It has been revealed that in a study conducted in Turkey, eating awareness is lower in those with low income (Yalçın et al. 2022). The effects of income level on academic success also have an important place in our research. It has been determined that students with higher income levels have more access to educational materials and extracurricular activities, therefore their academic success is higher. Additionally, considering the effect of income level on eating

behaviors, it can be concluded that healthy nutrition positively affects academic success. Economic inadequacies make it difficult for students to maintain healthy eating habits, and this negatively affects their academic performance.

Since poor sleep quality can negatively affect many processes such as students' adaptation, perception, and understanding in the classroom, emphasis is placed on preventing sleep deprivation and improving sleep quality to improve students' academic performance (Sharman et al. 2021). According to meta-analytic results from 11 separate studies conducted by Musshafen et al. (2021), while sleep duration was not significantly associated with overall academic performance, sleep quality showed a significant correlation. Several studies have indicated that poor sleep quality negatively affects students' academic performance, resulting in daytime sleepiness, attention deficits, and impairments in cognitive functions (Rodriguez et al. 2023, Andersen et al. 2023). Similarly, Filiz and Kaya (2021) found in their study on students that sleep quality is a significant predictor of academic achievement. However, some studies do not confirm this relationship and fail to find a significant difference between sleep quality and academic success (Carter et al. 2023, Çiftçi and Muslu 2023). Findings from an experimental study indicate that maintaining adequate sleep patterns has a significant impact on eating habits and diet quality, whereas insufficient, short, and poor-quality sleep tends to increase individuals' energy intake through more frequent and irregular eating patterns, thereby reducing nutritional quality (Barragán et al. 2023). This highlights the importance of developing healthy sleep habits, which can positively impact nutrition and overall health.

The interplay between sleep quality and nutrition significantly impacts students' overall health and academic achievements. Unhealthy lifestyle habits such as smoking, alcohol consumption, imbalanced diet, lack of physical activity, stress, and excessive internet use can lead to decreased sleep quality, which may have negative effects on academic success (Şahin et al. 2020, Barragán et al. 2023). In our recent study, significant differences were found between eating behavior and sleep quality, but no significant relationship was detected between sleep quality and academic achievement. Our study identifies significant findings regarding socio-demographic variables that influence sleep quality and consequently academic performance. We found significant differences in sleep quality scores between undergraduate and associate degree students, indicating a relationship between educational status and sleep quality. Additionally, men had higher sleep quality scores compared to women, with gender showing a significant relationship with sleep quality ( $p < .05$ ). Rodriguez et al. (2023) found in their study that sleep quality was better among male adolescents compared to females, attributing higher levels of physical activity to better sleep quality. Andersen et al. (2023) highlighted that women may be more prone to sleep disorders and emphasized the importance of considering gender-specific factors in clinical sleep evaluations. In contrast, Carter et al. (2023) reported in their study that men experience more sleep disorders compared to women. Çiftçi and Muslu (2023), however, did not find significant differences in the relationship between sleep quality and gender.

School-age children have been the focus of various studies emphasizing how inadequate sleep affects their dietary habits and nutrient intake. Molu et al. (2024) underscored that the intensity of curriculum requirements and preparation for professional exams among final-year nursing students, including rigorous theoretical classes, clinical practices, and exam preparations, can detrimentally impact their sleep quality. Their study with nursing students identified a significant relationship between class level and average PSQI score, as well as between class level and academic achievement. In our recent study, high PSQI scores were observed among final-year and third-year university students, and significant differences in students' RCSQ scores were identified across different academic years.

The literature identifies a positive relationship between academic achievement and healthy lifestyle habits. The impact of healthy lifestyle behaviors on academic performance is supported by studies such as those by Çakır and Erbaş (2021) and Whatnall et al. (2019). Specifically, it has been noted that regular and balanced nutrition, adequate sleep, and regular physical activity contribute to improved academic performance (Çakır and Erbaş 2021, Whatnall et al. 2019, Martinez et al. 2020). The improvement in academic performance with the enhancement of healthy lifestyle behaviors can be based on the student's level of awareness and responsibility (Çakır and Erbaş 2021). Research handled on university students across 26 countries in Asia, Africa, North and South America has reported that consuming a balanced diet rich in vegetables and fruits enhances academic performance (Whatnall et al. 2019). A study conducted in Australia supported similar findings, indicating a relationship between increased academic achievement among university students and higher consumption of fruits and vegetables, reduced consumption of sugary beverages, and improved diet quality (Martinez et al. 2020). In our recent study with university students, significant differences were found between academic achievement and eating behaviors ( $p < .05$ ). Total eating behavior scores of associate degree students were higher than those of bachelor's degree graduates. Additionally, we found significant differences in total eating behavior

scores related to monthly income levels ( $p < .05$ ). Increasing healthy lifestyle habits may positively influence students' academic achievements.

The data for the study were collected from students residing in dormitories affiliated with the Credit and Dormitories Institution of the university. Additionally, in this study, students residing in dormitories were not grouped based on the number of roommates. Due to the large sample size, the sample was stratified only by gender. This is considered a limitation of the study.

## Conclusion

This study reveals the relationships between university students' eating behaviors, sleep quality, and academic achievements. The findings indicate that unhealthy eating habits, poor sleep, and inadequate sleep quality can negatively impact academic performance. These results underscore the significant influence of students' sleep quality on their academic performance and overall quality of life. While the literature on the relationship between sleep quality and academic achievement shows inconsistent results, it is evident that overall health status and healthy lifestyles contribute positively to academic performance. Therefore, improving students' sleep routines and enhancing sleep quality are crucial in supporting their academic achievements and overall health. This study provides significant insights into eating behaviors, academic performance, and sleep conditions and quality. These findings highlight the importance of adopting healthy lifestyle habits and their sustainability in enhancing students' academic achievements. In this context, educational institutions and relevant authorities are encouraged to implement awareness-raising programs on healthy lifestyles. Educational institutions and families should support students in adopting healthy lifestyle habits. It is also important to ensure that dormitory rules are implemented, to reduce the number of students staying in rooms, to ensure that students have access to healthy foods in their food menus, and to support economically weak students.

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