



Relation of Sleep Quality to Psychological Well-being in College Students During the COVID-19 Pandemic: Cross-sectional Survey Study

COVID-19 Pandemisinde Üniversite Öğrencilerinde Uyku Kalitesinin Psikolojik İyi Oluşla İlişkisi: Kesitsel Bir Çalışma

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Abstract

Objective: This study aimed to determine the relationship between psychological well-being and sleep quality of university students during the Coronavirus disease-2019 (COVID-19) pandemic.

Materials and Methods: The research was a web-based cross-sectional study conducted with 972 college students. Data were collected using a personal information form, the psychological well-being scale (PWS), and the Pittsburgh Sleep Quality Index (PSQI).

Results: In the study, 92.4% of the students had poor sleep quality (≥ 6 -point) PSQI mean score. The mean PSQI global score of the students was 8.41 ± 2.24 and the mean PWS score was 42.35 ± 8.85 . A negative statistically significant strong correlation was found between the PWS and the PSQI scores of the students ($r = -0.335$; $p = 0.000$; $p < 0.01$).

Conclusion: College students studying with distance education system during the COVID-19 pandemic are at risk in terms of sleep quality and psychological well-being.

Keywords: COVID-19, college students, pandemic, sleep quality, psychological well-being

Öz

Amaç: Bu çalışmada, Koronavirüs hastalığı-2019 (COVID-19) pandemisinde üniversite öğrencilerinin psikolojik iyi oluşla uyku kalitesi ilişkisinin belirlenmesi amaçlanmıştır.

Gereç ve Yöntem: Araştırma 972 üniversite öğrencisi ile yürütülen web tabanlı kesitsel bir çalışmadır. Veriler kişisel bilgi formu, psikolojik iyi oluş ölçeği (PIOÖ) ve Pittsburgh Uyku Kalite İndeksi (PUKİ) ile toplanmıştır.

Bulgular: Araştırmada öğrencilerin %92,4'ünün kötü uyku kalitesi (6 ve üzeri puan) PUKİ puan ortalamasına sahip olduğu belirlenmiştir. Araştırmada öğrencilerin PUKİ puan ortalaması $8,41 \pm 2,24$, PIOÖ puan ortalaması ise $42,35 \pm 8,85$ saptanmıştır. Öğrencilerin PIOÖ ile PUKİ puanları arasında güçlü negatif yönlü istatistiksel olarak anlamlı ilişki saptanmıştır ($r = -0,335$; $p = 0,000$; $p < 0,01$).

Sonuç: COVID-19 salgını sürecinde uzaktan eğitimle öğrenim gören üniversite öğrencilerinin uyku kalitesi ve psikolojik iyi oluş açısından risk altında olduğu bulunmuştur.

Anahtar Kelimeler: COVID- 19, üniversite öğrencisi, pandemi, uyku kalitesi, psikolojik iyi oluş

Introduction

The Coronavirus disease-2019 (COVID-19) outbreak started in Wuhan, China; however, the World Health Organization Emergency Committee declared a global health emergency on January 30, 2020, based on increased cases in China and international regions (1). COVID-19 has deeply affected individuals, as well as societies. Quarantines have caused enormous costs in terms of social, economic, and psychological well-being due to social distance, job losses, financial disruption,

loss of lives (2,3). These compulsory isolation periods affect the physical and mental health of individuals and lead to negative consequences on healthy lifestyle behaviors (4,5). New conditions and uncertainties such as domestic and international travel restrictions in many countries, compulsory isolation, concerns about the well-being of family and friends, uncertainty about going back to work and school, and lack of social support cause psychological pressure and contribute to the prevalence of stress, anxiety, and psychological well-being and insomnia on individuals (6,7).

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COVID-19 is spreading rapidly among people and dramatically affects the mental health of the general population and, in particular, students. College students are not among certain risk groups that are often at risk of coronavirus infection, however, they are among the groups most strongly affected by COVID-19 due to uncertainties on academic success, future career, and social life (8). To reduce the spread of COVID-19 among young and adult populations, many countries have decided to discontinue face-to-face education in universities and other educational institutions. After the COVID-19 outbreak started, education was suspended in higher education institutions for three weeks on March 16 2020 in Turkey. At the end of three weeks, an online education system was adopted and started to be implemented (9). However, this process has brought many difficulties both for students/lecturers and students' families and friends. The pandemic period has had a great impact on the practices of higher education students, especially in academic work and life. Conditions such as possible delays in educational institutions, technological concerns in online education, interruptions in internships, delayed graduation of candidate students, and obligation to stay at home during career development stages affect students' psychological well-being (10). Psychological well-being is a state of individuals capable of determining life decisions independently, controlling the environment effectively and positively. They can choose their relationships with others, the direction and purpose of life, self-acceptance (11). In the pandemic process, determining factors affecting sleep quality and psychological well-being in college students, especially studying with distance education is extremely important for taking necessary precautions and planning interventions. No study has been conducted in Turkey to investigate college students' sleep quality and psychological well-being during the COVID-19 pandemic. For this purpose, the study aims to determine the relationship between psychological well-being and sleep quality of university students during the COVID-19 pandemic.

Study Questions

- What are the sleep quality and psychological well-being levels of college students?
- Is there a difference between the personal characteristics and the sleep quality and psychological well-being levels of college students?
- Is there a correlation between the sleep quality and psychological well-being levels of college students?

Materials and Methods

Study Design and Setting

The research was designed as a web-based cross-sectional study covering all college students in Turkey. The population of the study consisted of all students receiving education between June 2020 and November 2020 and the sample consisted of 972 students who agreed to participate in the study.

Inclusion Criteria

Students selection criteria were literate, studying at university, agreeing to participate in research.

Data Collection Tools

The data was collected using the personal information form prepared by the researchers in line with the literature, the Pittsburgh Sleep Quality Index (PSQI), and the Psychological Well-being Scale (PWS).

Personal Information Form

The questionnaire was prepared by the researchers in line with the literature. It consists of 34 questions regarding the socio-demographic characteristics of the students such as gender, age, educational status, marital status, number of children, presence of chronic disease (diabetes mellitus, asthma, chronic obstructive pulmonary disease and obstructive sleep apnea syndrome), their habits that may affect sleep, and social isolation status during the COVID-19 pandemic.

Psychological Well-being Scale

The scale was developed by Diener et al. (12) to evaluate the psychological well-being level of individuals and adapted to Turkish by Telef (13). It has a 7-point Likert-type system and the scoring ranges from "strongly disagree" to "strongly agree". A high total score from the scale indicates that the individual has many psychological resources and power (13). The lowest score obtainable from the scale is 8 and the highest score is 56.

Pittsburgh Sleep Quality Index

The Turkish validity and reliability study of the scale was conducted by Agargun et al. (14). The PSQI provides information on sleep quality and the type and severity of sleep disturbances in the last month. It consists of 24 questions in total; 19 questions are answered by the individual and 5 questions are answered by the individual's bed-mate. The questions answered by the individual are taken into consideration and the other questions are not evaluated. Scores ≥ 5 indicate significant sleep disturbance (14).

Data Collection

In the data collection process, measurement tools were applied online due to the COVID-19 pandemic. The research was carried out online between June and November 2020 with a total of 972 college students who were receiving education at universities in Turkey and agreed to participate in the research. In this regard, an accessible online data collection link prepared on Google Documents was delivered to the target audience through social networks. It took 15-20 minutes to fill in the forms.

Statistical Analysis

The research data were transferred into a computer environment and analyzed in the IBM SPSS Statistics 21 package program. The Shapiro-Wilk test was used to test the fitness of the data to normal distribution. In the statistical analysis, the sociodemographic variables of the students were presented with number and percentage statistics. The mean PSQI global

and PWS scores of the college students and standard deviations were calculated. The independent samples t-test and one-way ANOVA were used in univariate analyses. Pearson's correlation analysis was used to examine the correlation between the PSQI global and PWS scores of college students. The statistical significance was taken as $p < 0.05$.

Ethical Statement

Prior to the study, ethics approval was obtained from the Balikesir University Clinical Research Ethics Committee (decision date/no:10.06.2020/2020/93) and the research permission was obtained from the Ministry of Health. The participants were informed about the study on the first page of the form and it was stated that filling the form was based on voluntariness. The students who agreed to participate in the research clicked

on the "I approve" button on the screen including the online questionnaire. Permissions for the scales were obtained via e-mail.

Results

Evaluation of Scale Scores with Socio-demographic Variables

The mean age of the students in the research group was 20.93 ± 2.50 . Table 1 includes the comparison of the individual characteristics of the students and their mean PSQI global and PWS scores. In the research group, the mean PSQI global score was higher in female students compared to male students, in those who did not have a chronic disease compared to those who had a chronic disease, and in those who used a mobile phone/tablet/computer before going to bed at night compared

Characteristics	Number	%	PSQI mean \pm SD	PWS mean \pm SD	PSQI test/p-value	PWS test/p-value
Gender						
Female	779	80.1	8.50 \pm 2.26	42.29 \pm 8.83	*t=3.252	*t=3.252
Male	193	19.9	8.06 \pm 2.11	42.61 \pm 8.96	p=0.010	p=0.654
Year in the curriculum						
1	281	28.9	8.24 \pm 2.11	42.72 \pm 8.44	-	-
2	331	34.1	8.42 \pm 2.37	42.32 \pm 9.21	**F=1.109	**F=0.273
3	179	18.4	8.62 \pm 2.15	42.00 \pm 9.14	p=0.345	p=0.845
4	181	18.6	8.48 \pm 2.26	42.21 \pm 8.58	-	-
Department						
Nursing	379	39.0	8.46 \pm 2.25	41.82 \pm 8.71	-	-
First and emergency aid associate	218	22.4	8.38 \pm 2.13	42.26 \pm 8.80	-	-
Midwifery	202	20.8	8.33 \pm 2.19	43.62 \pm 8.43	**F=2.230	**F=2.190
Medical documentation and secretary training	36	3.7	7.27 \pm 2.57	45.13 \pm 6.72	p=0.038	p=0.047
Geriatric care	43	4.4	8.88 \pm 2.72	40.46 \pm 10.95	-	-
Home care service	46	4.7	8.78 \pm 2.33	41.52 \pm 8.85	-	-
Other (medicine, dentist, engineering, educational sciences,..)	48	4.9	8.62 \pm 1.82	42.10 \pm 10.58	-	-
Chronic disease						
Yes	91	9.4	9.20 \pm 2.49	41.70 \pm 9.41	*t=3.300	*t=0.351
No	881	90.6	8.33 \pm 2.20	42.42 \pm 8.80	p=0.000	p=485
Smoking						
Yes	214	22.0	9.07 \pm 2.40	40.63 \pm 10.07	*t=3.159	*t=12.500
No	758	78.0	8.23 \pm 2.16	42.84 \pm 8.42	p=0.000	p=0.000
Alcohol use						
Yes	112	11.5	9.00 \pm 2.62	40.22 \pm 11.75	*t=7.248	*t=30.348
No	860	88.5	8.34 \pm 2.18	42.63 \pm 8.37	p=0.012	p=0.037
Using a cell phone/tablet/TV at night						
Yes	953	98.0	8.44 \pm 2.24	42.29 \pm 8.88	*t=1.948	*t=1.018
No	19	2.00	6.89 \pm 1.79	45.47 \pm 6.84	p=0.001	p=0.061
Eating at night						
Yes	449	46.2	9.00 \pm 2.34	40.77 \pm 9.57	*t=13.049	*t=19.547
No	523	53.8	7.91 \pm 2.02	43.71 \pm 7.95	p=0.000	p=0.000

*t-test, **One-Way ANOVA, PSQI: Pittsburgh Sleep Quality Index, PWS: Psychological Well-being Scale, SD: Standard deviation

to those who did not use and the difference was statistically significant ($p < 0.05$). No statistically significant difference was found between these variables and the mean PWS score ($p > 0.05$). In the research group, the mean PSQI global score was higher and the mean PWS was lower in the students who were receiving education in the elderly care department, who were smokers and alcohol users, and who had the habit of eating at night and a statistically significant difference was found between these variables and both scales ($p < 0.05$). No statistically significant difference was found between the students' grades and the mean PSQI global and PWS scores ($p > 0.05$).

Evaluation of Scale Scores with Students' Knowledge of the COVID-19

Table 2 includes the comparison of students' knowledge of the COVID-19 with their mean PSQI global and PWS scores. In the research group, no statistically significant difference was found between the place where the student first heard about the COVID-19, the status of knowing transmission routes of COVID-19, and the status of contact with a COVID-19 patient and the mean PSQI global and PWS scores ($p > 0.05$). The mean PSQI global score was higher and the mean PWS score was lower in students who did not know the importance of social distance for the COVID-19 disease and a statistically significant difference was found between this variable and the mean PWS score ($p < 0.05$). The mean PSQI global score was higher and the mean PWS score was lower in students who did not wear a mask when going out and a statistically significant difference was found with both scales ($p < 0.05$).

Relationship Between the PSQI Global Scale Scores and the PWS Scale Scores

In Table 3, a statistically significant negative correlation was found between the students' PSQI global score and PWS score (the PWS score decreased as the PSQI global score increased) ($r = -0.335$; $p = 0.000$; $p < 0.01$). It was determined that 92.4% of the students had poor sleep quality (≥ 6 -point) PSQI global score.

Discussion

The COVID-19 pandemic has dramatically changed the lifestyles and educational environment of students at all educational levels with unprecedented consequences and has had significant educational and psychosocial effects (8,15). This study was conducted to determine the sleep quality and psychological well-being and affecting factors in college students in Turkey during the COVID-19 pandemic period. The majority of the students (92.4%) had a bad level of sleep quality and moderate psychological well-being. It is thought that distance education, lack of social activities, changes in daily routines may have directly or indirectly affected psychological well-being and

Variables	r	p	n
PSQI PWS	-0.335	0.000	972

* $p < 0.01$, r: Pearson's correlation, PSQI: Pittsburgh Sleep Quality Index, PWS: Psychological Well-being Scale

Characteristics	Number	%	PSQI mean \pm SD	PWS mean \pm SD	PSQI p-value	PWS p-value
The student first heard about the COVID-19						
Internet	507	52.2	8.43 \pm 2.26	42.38 \pm 8.89	**F=1.645	**F=1.737
TV	394	40.5	8.30 \pm 2.18	42.56 \pm 8.56	p=0.177	p=0.158
School	27	2.8	9.07 \pm 2.38	38.66 \pm 8.08	-	-
Health institution	44	4.5	8.88 \pm 2.39	42.47 \pm 11.00	-	-
The status of knowing transmission routes of COVID-19						
Respiratory	239	24.6	8.42 \pm 2.27	42.12 \pm 8.79	-	-
Respiratory and droplet	469	48.3	8.47 \pm 2.30	42.54 \pm 8.84	**F=0.350	**F=0.767
Close contact	212	21.8	8.39 \pm 2.09	42.44 \pm 8.76	p=0.789	p=0.513
Respiratory and close contact	52	5.3	7.98 \pm 2.12	41.36 \pm 9.77	-	-
The status of contact with a COVID-19 patient						
Yes	25	2.6	9.00 \pm 2.32	40.48 \pm 11.07	*t=0.005	*t=1.618
No	947	97.4	8.40 \pm 2.24	42.40 \pm 8.79	p=0.217	p=0.396
Knowing the importance of social distance in COVID-19 disease						
Yes	962	99.0	8.40 \pm 2.22	42.45 \pm 8.73	*t=2.558	*t=2.558
No	10	1.0	10.10 \pm 3.17	32.80 \pm 2.22	p=0.126	p=0.045
Wearing a mask when going out						
Yes	914	94.0	8.37 \pm 2.21	42.62 \pm 8.59	*t=2.558	*t=12.832
No	58	6.0	9.06 \pm 2.56	38.08 \pm 11.50	p=0.049	p=0.004

*t-test, **One-Way ANOVA, PSQI: Pittsburgh Sleep Quality Index, PWS: Psychological Well-being Scale, SD: Standard deviation, COVID-19: Coronavirus disease-2019

contributed to the deterioration in sleep quality of the students. This finding supports the literature indicating that individuals may experience severe sleep problems during epidemics (6,7,16-19). A study conducted with higher education students living in seven different countries reported that poor sleep quality was an urgent concern among higher education students around the world during the COVID-19 pandemic (19). Similarly, some studies conducted with students indicated that the quality of sleeping students got worse during the COVID-19 pandemic (20-25). Unlike the results of the research, a decrease in subjective well-being during the COVID-19 pandemic was reported and 20% fewer students felt extremely tired and sleepy when awakened compared to before restrictions (26). Bhandari and Kaur (27) stated that most of the college students had a healthy sleep pattern during the restrictions and that fewer college students had a severe sleep pattern interval. In college students, poor sleep quality is associated with alcohol consumption (28) and smoking (29). In the study, there was an increase in poor sleep quality and a decrease in psychological well-being in students who were smoker/alcohol users. In a similar study, smoking students were found to have the worst sleep quality scores among all analyzed groups (23). According to the results obtained in the study, those who used a mobile phone/tablet/computer before going to bed at night were found to have worse sleep quality. Social media offers an opportunity to improve social isolation, but the use of digital media near bedtime can have a great negative impact on the sleep outcomes of young adults (16). Similarly, some studies reported an increase in technology use before going to bed during the restriction period and a decrease in sleep quality (16,30). It was determined that the sleep quality of female students was worse than that of male students. A study conducted with nursing students reported that similar total scores were obtained in both genders, but female students had significant changes during the restriction period (23). It was stated that female students may have fewer coping strategies in uncertain and stressful situations (10). In-depth studies are required to detect gender-specific differences. Students who had a chronic disease (diabetes mellitus, asthma, chronic obstructive pulmonary disease and obstructive sleep apnea syndrome), were found to have poor sleep quality. Insufficient and poor-quality sleep is an independent risk factor for many chronic diseases and chronic diseases can create a mechanism that negatively affects sleep quality (20). Those eating at night were found to have low sleep quality and psychological well-being. Studies conducted with students showed that those with night eating syndrome had a significant decrease in sleep quality (31,32). No diagnosis was made for eating disorders in the study; however, lower sleep quality rates among students eating at night compared to the others revealed the importance of further research to balance the nutrition of the students during the day, diagnose eating disorders, and plan the necessary interventions. The place where the students first heard about the COVID-19 virus was the internet by 52.2% and television by 40.5%. Health information provided during an epidemic should be

evidence-based to prevent negative psychological reactions. At this point, it is extremely important to improve the health literacy of college students. The majority of the students knew the importance of social distance and wearing masks. This result is important in terms of preventing the spread and transmission of the disease. However, rates regarding the transmission routes were below the expected level. This result emphasizes the lack of knowledge in students and the need for support. In the first stage of the COVID-19 epidemic in China, it was shown that the internet (93.5%) was the primary health information source for the general public and similarly, most of the participants had appropriate behaviors regarding protective measures such as hand washing and wearing masks (33). In the study, it was seen that the sleep quality and psychological well-being levels of those who did not know the importance of social distance and who did not wear a mask when going out were low. Psychological well-being is a phenomenon that includes being able to look at the bright side of negative situations and difficulties and having the ability to manage them. It is thought that students who do not know the importance of social distance and do not wear masks do not have these skills, so their psychological well-being levels are affected. A moderate negative correlation was found between the mean sleep quality and psychological well-being scores. Accordingly, the psychological well-being level of the students increased as the sleep quality increased. This result supports the literature findings associating healthy lifestyle behaviors with increased life expectancy and psychological well-being (4). During the pandemic period, sleep quality is essential for physical health as well as for mental balance to increase immune defense (25). Findings regarding the effect of the pandemic on sleep emphasize that sleep-related problems in students during the pandemic period should be an important component of mental health interventions. Addressing sleep problems in higher education students is an urgent concern, especially during stressful events. These results support the importance of making education and behavior-based sleep programming available to higher education students.

Study Limitations

Our findings cannot be generalized to the entire society since only a limited group of individuals (college students) were evaluated in the study. Furthermore, the use of a web-based questionnaire in the data collection process possibly causing selection bias constitutes the limitations of our study.

Conclusion

It was determined that the majority of the college students had poor sleep quality and moderate psychological well-being levels. The psychological well-being of the students increased, as the sleep quality increased. In this context, during and after the pandemic, it is extremely important to implement individual and social mental health-related public health policies with pandemic intervention strategies. It is recommended to plan additional studies and training programs to increase the psychological well-being and sleep quality of

students, especially those at risk such as female students, those with chronic diseases, smokers/alcohol users, night-eaters, technology users before going to bed.

The resilience of collage students should be reinforced to ensure their capacity to resist possible future emergency situations, such as pandemics. In the pandemic process, determining factors affecting sleep quality and psychological well-being in college students, especially studying with distance education is extremely important for taking necessary precautions and planning interventions. No study has been conducted in Turkey to investigate college students' sleep quality and psychological well-being during the COVID-19 pandemic. It is thought that this study will raise awareness about the sleep behavior of students and the factors affecting sleep, and will shed light on the practices and future studies for students to develop quality sleep habits. Sleep trainings should be organized for family physicians, nurses and psychologists.

Ethics

Ethics Committee Approval: Ethics approval was obtained from the Balıkesir University Clinical Research Ethics Committee (decision no: 2020/93, date: 10.06.2020).

Informed Consent: Permissions for the scales were obtained via e-mail.

Peer-review: Internally and externally peer-reviewed.

Authorship Contributions

Concept: P.P.K., A.K., S.K., Design: S.E., P.P.K., A.K., Data Collection or Processing: S.E., P.P.K., A.K., S.K., Analysis or Interpretation: S.E., P.P.K., A.K., Literature Search: S.E., P.P.K., S.K., Writing: S.E., A.K.

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