Original Article

The relationships between university students' physical activity levels, insomnia and psychological well-being

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Abstract

Objectives: This study aims to determine university students' physical activity levels, insomnia and psychological well-being, and to examine the relationships between them.

Methods: This descriptive and correlation-seeking research's sample included 702 voluntarily participating students studying in the faculty of health sciences and the faculty of science and letters at a university. The data were collected using a 23-item participant information form, the International Physical Activity Questionnaire (IPAQ), the Bergen Insomnia Scale (BIS) and the Psychological Well-being Scale (PWBS). Descriptive statistics, the Mann-Whitney U test, the Kruskal-Wallis test, the chi-squared test, logistic regression analysis and the Games-Howell post hoc test were used to evaluate the data.

Results: Of the students, 20.4% were inactive, 57% were minimally active, and 22.6% were sufficiently active. Of them, 59.3% had insomnia. The participants' PWBS scores were above average (40.23±8.18). The students who described themselves as having a bad psychological state had more insomnia, and a one point increase in the PWBS score reduced the risk of insomnia by a factor of 0.972. The students with bad family relationships had increased risk of insomnia by a factor of 1.512, the students who had continual headaches had increased risk of insomnia by a factor of 2.504, and the students who used phones in bed had increased risk of insomnia by a factor of 1.760.

Conclusion: High physical activity levels increased psychological well-being, and high psychological well-being scores, good family relationships and regular physical activity reduced insomnia.

Keywords: Insomnia; physical activity; psychological well-being; university students.

Since the young population of a society come to universities to prepare for their professions and develop their personalities, attitudes toward life, healthy or unhealthy lifestyles and habits, they are important places for public health.[1]

In Turkey, the age of university students usually ranges from 18 to 23. In this period, students experience social, personal and academic changes and also have opportunities to make fresh starts.[2] Students need to complete their education and development successfully to discover themselves, to create an identity and to have a profession. Although some students live with their families, most students leave home to live in environments such as dormitories or with their friends. These

changes in their lives can negatively affect their psychological well-being if they cannot find support or deal with these changes on their own. As a result, students can experience problems, such as adaptation problems, anxiety, depression, smoking and substance use.[3,4]

Psychological well-being is defined as having a purpose in life, building good relationships with people, coping with difficulties and trying to improve by realizing one's own potentials. Ryff developed the Psychological Well-being Scale to determine psychological well-being. Its sub-scales are: self-acceptance, positive relationships, environmental mastery, purpose in life, personal growth and autonomy. These concepts are

What is known on this subject?

• It is a fact that university students are not physically active, that they suffer from low sleep quality, and that they commonly experience anxiety and stress disorders.

What is the contribution of this paper?

• This study indicated that higher physical activity levels increased psychological well-being, that a one-point increase in the psychological well-being score reduced the risk of insomnia by a factor of 0.972, and that positive family relationships and regular physical activity reduced insomnia.

What is its contribution to the practice?

• This study will provide recommendations to nurses who work with university students to increase students' psychological well-being and physical activity, and to reduce their insomnia levels.

the requirements of psychological well-being.[5] Studies in the literature have found that university students' psychological well-being is affected by variables such as family support, self-efficacy, social support, gender, excessive use of smart phones, values and traditions.[6–8]

All people, including university students, should adopt healthy lifestyle habits such as a healthy diet, regular sleep and physical activity to live healthy and happy lives and be successful.[9,10] Sleep is one of the most important daily activities that affect the quality of life. Sleep is a period in which one cannot perceive some or all of the external stimuli, one's reactions get weaker, and the body is allowed to rest.[11] University students are at risk of sleep disorders because they are not under the supervision of their families, they determine their sleep hours on their own, their stress levels increase because of their courses, and they spend too much time engaged in social activities, on the internet and playing computer games.[12] Previous studies of university students in Turkey have found that more than half of them sleep poorly, and that sleep quality has a positive relationship with mental health and physical activity.[13]

Physical activities are actions with different intensities that create tiredness because people use their muscles and joints and spend energy walking, running, jumping, swimming or riding bikes.[14] Lack of physical activity is the fourth biggest risk factor among the causes of death: 21–25% of breast and colon cancers, 27% of type 2 diabetes and 30% of ischemic heart disease are caused by lack of physical activity.[15] The literature indicates that during students' university years, sedentary lifestyles increase, and the rate of physical activity decreases.[16] Arslan et al.[17] (2018) reported that, of 18 to 24 year olds, only 15% are sufficiently active, and 52.1% have varying levels of depression. They also found that higher physical activity levels reduces depression and increases academic success.

Previous studies have shown that, during their adaptation to university life, students' physical activity levels decrease, and they experience sleep disorders, which lead to psychological problems and increase the risk of suicide, and involvement in fights or motor vehicle accidents.[18] Students' university years put them at risk for mental illnesses such as obsessive-compulsive disorders, depression and anxiety disorders, which

are seen commonly and negatively affect their psychological well-being.[19,20]

Health professionals and nurses working in the medico-social centers of universities are responsible for improving students' psychological, physical and social health, diagnosing their current problems, and planning and administrating interventions for students with problems. An analysis of the literature showed that studies of university students in Turkey have generally investigated negative conditions such as depression, anxiety, and stress and sleep quality. Few studies have investigated university students' physical activity, insomnia and psychological well-being; especially the number of studies on the relationship between physical activity and psychological well-being- is limited.[9,17] Therefore, this study will fill a gap in the literature and can be used as a resource by future studies. This study was conducted to determine the relationships between university students' physical activity levels, insomnia and psychological well-being. It seeks to answer these questions:

1. What are psychological well-being scores, insomnia rates and physical activity levels of the students?
2. What are the factors that affect psychological well-being, insomnia and physical activity?
3. Are there relationships between psychological well-being, insomnia and physical activity?

Materials and Method

Study Design

This study has a descriptive and correlational design.

Population and Sample

This study was carried out with the students studying at the faculty of health sciences and the faculty of science and letters of a public university in Istanbul, Turkey from 10.15.2019 to 12.31.2019. The faculty of health science was chosen for the study because its students would benefit from training about physical activity, insomnia and psychological well-being, and the faculty of science and letters was chosen because the researchers assumed that its students do not receive training about physical activity, insomnia and psychological well-being and because they were easy to access. The sample size was determined using N-value sampling and proportional stratified sampling separately for both faculties. The study population was composed of 5,144 students: 2,584 in the faculty of health sciences and 2,560 in the faculty of science and letters. The study sample was determined to require a minimum of 669 students: 335 in the faculty of health sciences and 334 studying the faculty of science and letters. The study was completed with 702 students who agreed to participate voluntarily and who answered all the questions on the questionnaires.

Inclusion Criteria

voluntary participation and completing all the data collection tools.

Dependent and Independent Variables

The independent variables were the students' sociodemographic characteristics (age, gender, class, body mass index [BMI], faculty, etc.) and physical activity levels. The dependent variables were insomnia and their psychological well-being scores.

Data Collection Methods and Tools

The study data were collected using questionnaires based on self-reporting: a personal information form, the International Physical Activity Questionnaire (IPAQ), the Bergen Insomnia Scale (BIS) and the Psychological Well-being Scale (PWBS).

The Personal Information Form

This form was developed by the researcher. It has 23 closed-ended questions about independent variables that are considered to affect students' sociodemographic characteristics, psychological well-being, insomnia and physical activity.

The International Physical Activity Questionnaire (IPAQ): This scale was developed to determine the physical activity levels of 15–65 year olds. In 1998, studies were conducted in Geneva to develop the IPAQ. It has seven questions about vigorous and moderate physical activity, walking and sitting in the last seven days, their number of days per week and their duration in minutes. The term, metabolic equivalence (MET), is used to indicate the amount of oxygen the body uses during physical activity. The MET-minute/week score is calculated by the multiplying the number of days and minutes of activity by the MET value. Vigorous physical activities are multiplied by 8 MET, moderate physical activity is multiplied by 4 MET, and walking is multiplied by 3.3 MET. The total MET score for a week is calculated by adding the MET scores. The MET score physical activity levels are: 599 or less=inactive; 600-3,000=minimally active, and 3,000 or more=sufficiently active. The Turkish adaptation, reliability and validity studies of the scale were carried out by Öztürk and Arıkan in 2005.[21,22]

The Bergen Insomnia Scale (BIS): This scale is based on the diagnostic criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM-4), but it is also suitable for the diagnostic criteria of the DSM-5. It has six questions about the symptoms of insomnia. The weekly number of days of sleep problems are indicated between 0 and 7 days on a scale of 8. The Turkish validity and reliability study of the scale was carried out by Bay and Ergün[23] (2018), who determined that its Cronbach's alpha reliability coefficient was 0.85. The lowest possible score on this scale is 0, and the highest is 42. According to the DSM-5 diagnostic criteria, a score of 3 or more on at least one of the first three questions of the scale is defined as insomnia, and a score of 3 or more on at least one of the last two questions is also defined as insomnia. In this study, the Cronbach's alpha reliability coefficient of this scale was 0.70.

The Psychological Well-being Scales (PWBS): This scale was developed to measure psychological well-being, and its Turkish adaptation study was carried out by Telef (2013). The scale has 8 items which are scored from strongly disagree (1) to strongly agree (7). The lowest possible score on this scale is 8, and the highest is 56. Higher scores indicate higher psychological well-being. Its original Cronbach's alpha internal consistency coefficient was 0.80,[24] and it was 0.83 in this study.

Ethical Considerations

Ethical approval and written permission were obtained from the faculty of health sciences ethics committee and from the institutions where the study was carried out. Permission was obtained from the authors of the scales used in the study. The students' consent was obtained after informing them about the study, voluntary participation and the confidentiality of their information.

Data Analysis

The data were evaluated using SPSS 21.0 software and non-parametric statistical analysis. The descriptive data are indicated as numbers, percentages and means. The differences between the independent variables and the dependent variables were evaluated using the chi-squared test, Kruskal-Wallis variance analysis and the Mann-Whitney U test. Then the descriptive Games-Howell post hoc test was used. Logistic regression analysis was used to investigate the multivariate relationships between the independent variables and insomnia.

Results

Of the participants, 73.4% were female and 26.6% were male. Of them, 50.4% were studying in the faculty of science and letters, and 49.6% were in the faculty of health sciences. Their mean age was 20.41±2.10. Of the students, 12.8% had thin BMIs, 67.9% were normal weight, 15.2% were overweight, and 4.1% were obese. Of them, 56% lived with their families, 10% lived with friends, 5.4% lived alone, 27.5% lived in dormitories, and 1.1% lived with relatives. Of them, 8.7% had a diagnosed physical illness, 4.4% had a diagnosed psychological illness, 20.8% had constant pain, and 80.2% spent time on their phones in bed (Table 1). Of the students, 73.9% reported that they were active in their free time, 72.2% did no regular physical activity, and 77.6% did not engage in sports.

The students' IPAQ weekly MET score indicated that 20.4% of them were inactive, 57% were minimally active, and 22.6% were sufficiently active. Table 2 shows a comparison of their sociodemographic characteristics and physical activity levels. The males' rate of being sufficiently active (38.5%) was higher than that of the females (16.9%), and this difference was statistically significant (p<0.001). Of the students who had thin and normal BMIs, 21.7% were inactive, and 14.8% of the overweight and obese students were inactive. This difference was also statistically significant (p=0.001). The rate of being sufficiently active of students who were active in their

Table 1. The students' descriptive characteristics

Variables	n	%
Gender		
Female	515	73.4
Male	187	26.6
Age groups (mean=20.41±2.10)		
17–20	397	56.6
21–24	290	41.3
25 or older	15	2.1
Faculty		
Faculty of Science and Letters	354	50.4
Faculty of Health Sciences	348	49.6
Body mass index		
Thin (<18.5)	90	12.8
Normal (18.5–24.9)	477	67.9
Overweight (25–29.9)	106	15.2
Obese (≥30)	29	4.1
Place of residence		
Family home	393	56
Apartment with friends	70	10
Alone in an apartment	38	5.4
Student dormitory	193	27.5
With relatives	8	1.1
Diagnosed physical illness		
Yes	61	8.7
No	641	91.3
Diagnosed psychological illness		
Yes	31	4.4
No	671	95.6
Constant pain		
Yes	146	20.8
No	556	79.2
Using phones in bed		
Yes	563	80.2
No	139	19.8

free time (23.3%) was higher than that of the students who were not (20.8), and this difference was statistically significant (p=0.014). The rate of being sufficiently active of the students who engaged in sports (35.6%) was higher than that of the students who did not (18.9%), and this difference was statistically significant (p<0.0001). No statistically significant differences were found between the students in terms of their faculty, age and physical activity levels (p>0.05).

The students' Bergen Insomnia Scale scores indicated that 59.3% of them had insomnia. Table 3 shows a comparison of students' insomnia and the variables that were considered to affect insomnia. The students who reported that their family relationships were bad or very bad (p=0.02), or that their psychological states were bad or very bad (p<0.001) had more insomnia than the other students. The students who said that they had too much stress (p<0.001) and who spent time on

their phones in bed (p=0.002) had more insomnia than the other students. The students who were not active in their free time (p=0.001) had more insomnia than the students who did, and the students who did not do regular physical activity also had more insomnia than the students who did (p=0.001). The students who had sports facilities near their place of residence, who had sufficient places for physical activity on their campus, whose number of days of physical activity was higher, who worked out in their free time, who went on trips, who spent time with their families and friends, and who went to the cinema or theater, and watched TV had less insomnia than the students who did not, and this difference was statistically significant (p<0.05).

The students' mean PWBS score was 40.23±8.18 (min=10, max=56). Table 4 shows a comparison of their mean PWBS scores and independent variables. The students who were in the 21-24 age group (41.08±8.03), who did not have a diagnosed psychological illness and who did regular physical activities had higher mean PWBS scores than the students who were in the other age groups (p=0.041), who did have a diagnosed psychological illness (p=0.012), and who did not do regular physical activity (p<0.001). The students who were active in their free time had higher mean PWBS scores than the students who did not (p<0.001), and the students who did not have insomnia had higher mean PWBS scores than the students who did (p<0.0001). No significant differences were found by gender, phone use in bed and mean PWBS scores (p>0.05).

The mean PWBS scores of the students who evaluated their relationships with family (p<0.0001) and friends (p<0.0001) as very good were higher than the students who evaluated them as bad, moderate or good. The advanced analysis found that while there were no significant differences between the students whose family relationships were bad, very bad or moderate, there were significant differences between all the other paired groups (p<0.05). The advanced analysis for relationships with friends found significant differences between all the groups (p<0.05). The students who evaluated their psychological state as very good had higher total mean PWBS scores than the students who evaluated their psychological state as bad, moderate or good (p<0.0001). The advanced analysis found a significant difference between all the groups (p<0.05). It was determined that students who evaluated their stress levels as low had higher mean PWBS scores than the students who evaluated their stress levels as moderate and too much stressed (p<0.0001). The advanced analysis found a significant difference between the students who had too much stress and the students who had low or moderate levels of stress (p<0.001). The mean PWBS scores of the students who had sufficiently active MET scores were higher than those of the students with other MET levels (p<0.0001). The advanced analysis found a significant difference between the inactive students and the sufficiently active students, and between the minimally active students and the sufficiently active students (p<0.05). However, no statistically significant difference was found between the mean scores of the inactive students and

Table 2. The students' physical activity levels, sociodemographic characteristics, leisure activities and regular physical activity

Variables	IPAQ scores						
	Inactive		Minimally active		Sufficiently active		Statistics
	n	%	n	%	n	%	χ^2; p
Gender							
Female	115	22.3	313	60.8	87	16.9	χ^2=6.820
Male	28	15.0	87	46.5	72	38.5	p<0.0001
Age groups (mean=20.41±2.10)							
17–20	85	21.4	232	58.4	80	20.2	χ^2=3.365
21–24	55	19.0	160	55.2	75	25.8	p=0.499
25 or older	3	20.0	8	53.3	4	26.7	
Faculty							
Faculty of Science and Letters	74	20.9	197	55.6	83	23.5	χ^2=0.522
Faculty of Health Sciences	69	19.8	203	58.4	76	21.8	p=0.770
Body mass index							
Thin (<18.5)	29	32.2	46	51.1	15	16.7	χ^2=24.069
Normal (18.5–24.9)	94	19.7	287	60.2	96	20.1	p=0.001
Overweight (25–29.9)	15	14.2	54	50.9	37	34.9	
Obese (≥30)	5	17.3	13	44.8	11	37.9	
Being active in free time							
Yes	92	17.7	306	59.0	121	23.3	χ^2=8.590
No	51	27.8	94	51.4	38	20.8	p=0.014
Regular physical activity							
Yes	14	7.2	107	54.9	74	37.9	χ^2=51.176
No	129	25.4	293	57.8	85	16.8	p<0.0001

χ^2: Chi-square test.

the minimally active students (p>0.05) (Table 5). The students who worked out, went on trips, read books, listened to music, went to the cinema or theater, watched TV, played musical instruments, and spent free time with friends and family had higher mean PWBS scores than the students who did not, and this difference was statistically significant (p<0.05).

The regression analysis determined that the students whose family relationships were bad had insomnia 1.512 times more than the students whose family relationships were very good, that the students who had constant pain had insomnia 1.6 times more than the students who did not, that the students who used phones in bed had insomnia 1.760 times more than the students who did not, and that the students who had too much stress had insomnia 2.504 times more than the students who had lower stress levels. One unit of increase in the total psychological well-being score reduces the risk of insomnia by a factor of 0.972 (Table 6).

Discussion

This study, which was carried out to determine university students' physical activity levels, insomnia, and psychological well-being, and investigate their relationship, determined that most of the students' physical activity levels were at minimal levels. More than half of them had insomnia, and their mean psychological well-being scores were above average. The comparisons showed that sufficient physical activity increased psychological well-being, and that too much stress increased insomnia by a factor of 2.5.

This study found that 20.4% of students were inactive, 57% were minimally active, and 22.6% were sufficiently active according to IPAQ scores. Ölçücü et al.[25] (2015) found that 21% of university students were inactive, 43% were minimally active, and 36% were sufficiently active. Palaz[26] (2019) found that 29.8% of university students were inactive, 44.8% were minimally active, and 25.4% were sufficiently active. In both of these studies, the rates of students who were sufficiently active were higher than it was in this study. There were also more male participants in these studies than in this study. Like this study, other studies have found that the physical activity levels of male students are higher than the physical activity levels of female students.[27,28] In this study, since the number of female students was higher than that of other studies, the rate of sufficiently active students was lower.

In this study, 21.7% of the students with thin and normal BMIs were inactive, and 14.8% of the overweight and obese stu-

Table 3. The students' insomnia, social relationships, psychological states, stress levels, use of phones in bed and physical activity characteristics

Variables	The students without insomnia		The students with insomnia		Statistics
	n	%	n	%	χ^2; p
Family relationships					
Bad, very bad	2	16.7	10	83.3	χ^2=17.318
Moderate	25	34.7	47	65.3	p=0.02
Good	100	34.4	191	65.6	
Very good	159	48.6	168	51.4	
Relationship with friends					
Bad, very bad	3	18.7	13	81.3	χ^2=5.398
Moderate	27	34.6	51	65.4	p=0.249
Good	146	41.0	210	59.0	
Very good	110	43.7	142	56.3	
Perception of psychological state					
Bad, very bad	18	25.4	53	74.6	χ^2=24.006
Moderate	81	34.8	152	65.2	p<0.0001
Good	137	43.9	175	56.1	
Very good	50	58.1	36	41.9	
Stress levels					
Low stress levels	36	62.1	22	37.9	χ^2=29.489
Moderate stress levels	160	46.4	185	53.6	p<0.0001
Too much stress	90	30.1	209	69.9	
Using phones in bed					
Yes	213	37.8	350	62.2	χ^2=9.957
No	73	52.5	66	47.5	p=0.002
Being active in free time					
Yes	230	44.3	289	55.7	χ^2=10.541
No	56	30.6	127	69.4	p=0.001
Regular physical activity					
Yes	99	50.8	96	49.2	χ^2=11.247
No	187	36.9	320	63.1	p=0.001
Physical activity levels					
Inactive	52	36.4	91	63.6	χ^2=1.514
Minimally active	169	42.3	231	57.8	p=0.469
Sufficiently active	65	40.9	94	59.1	

χ^2: Chi-square test.

dents were inactive. Vural et al.[29] (2010) found that overweight and obese students were more active than thin and normal weight students. This may be because overweight and obese students increase their physical activity levels to lose weight. In this study, the physical activity levels of the students who did regular physical activity, who were active in their free time and who engaged in sports were higher than those of the others (p<0.05). Bozkuş et al.[30] (2013) determined that students who exercise had higher MET scores. This study supports their result. The students who read books, spent time with family and friends, and listened to music in their free time had higher physical activity levels than the students who did not. Clark et al.[31] (2016) found that listening to music during physical

activity stimulates the central nervous system, helps people tap out the rhythm of the exercise, and increases participation in and commitment to exercise. Another study found that the participation of young people's friends and families who support them increased their participation in physical activity.[32] These results show that listening to music, and the support of family and friends effectively increase physical activity. This study supports these results.

This study found that 59.3% of the university students had Bergen Insomnia Scale scores that indicate insomnia. A study carried out with Norwegian university students found that, according to the DSM-5 criteria, insomnia prevalence was 30.5%.[33] This lower rate may have arisen from sample, cul-

Table 4. A comparison of the students' mean Psychological Well-being Scale scores and certain variables

Variables	Total mean PWBS score		Statistics
	Mean	**SD**	
Gender			
Female	40.64	7.51	Z=1.135
Male	39.09	9.71	p=0.256
Age groups (mean±SD=20.41±2.10)			
17–20	39.65	8.20	Kwχ^2=6.373
21–24*	41.08	8.03	p=0.041
25 or older	39.07	9.54	
Diagnosed psychological illness			
Yes	36.10	9.47	Z=2.499
No	40.41	8.07	p=0.012
Regular physical activity			
No	43.14	7.82	Z=.6.381
Yapmayanlar	39.10	8.18	p<0.0001
Being active in free time			
Yes	41.72	7.37	Z=7.802
No	35.98	8.87	p<0.001
Insomnia			
Yes	38.83	8.24	Z=.5.700
No	42.25	7.66	p<0.0001
Using phones in bed			
Yes	40.06	8.03	Z=1.650
No	40.91	8.74	p=0.099

Kwχ^2: Kruskal-Wallis, Z: Mann-Whitney U; SD: Standard deviation.

ture and lifestyle differences. In this study, the students who had constant pain had higher rates of insomnia than the others (p<0.05). Like this study, other previous studies have also shown that pain negatively affects sleep.[30] In this study, the students who used phones in bed had significantly higher insomnia rates than the students who did not (p<0.05). The use of phones in bed increased the risk of insomnia by a factor of 1.6. This result is similar to those in the relevant literature.[34,35] This study found that the students who had bad family relationships had higher insomnia rates than the other participants (p<0.05). Like this study, a study carried out with adolescents found that the students who had bad family relationships had more insomnia.[36] In this study, the students who evaluated their psychological states as bad had more insomnia than the other students (p<0.05). Angelika et al.[37] (2007) determined that university students who suffer from sleep problems have more depression, stress and social phobia. This study's results support their results. Like this study, Steptoe et al.[38] (2008) determined that psychological well-being and insomnia affect each other bi-directionally. This study found that the students who had too much stress according to the BIS (69.9%) had higher insomnia rates than the students who had low (37.9%) and moderate (53.6%) level stress. Like this study, another study carried out with university students found that

stress negatively affects sleep.[39] In this study, the students who did not do regular physical activity had higher insomnia rates than the other students (p<0.05). This shows that regular physical activity positively affects sleep. Other studies have also determined that physical activity has a positive impact on sleep.[40,41] However, in this study, no significant correlation was found between the students' IPAQ physical activity levels and insomnia (p>0.05). This result is similar to those of other relevant studies.[42,43] The IPAQ evaluates physical activity performed in the last seven days. Higher physical activity levels in the last week do not necessarily mean that students perform regular physical activity in other weeks, too.

In this study, the students' total mean PWBS score was 40.23±8.18. Like this study, Deniz et al.[44] (2017) found that university students had a mean PWBS score of 41.72±9.5, and Baş et al.[45] (2016) found that students' mean PWBS score was 42.86±8.54. This study found that the mean PWBS score of the students in the 21–24 age group (41.08±8.03) were higher than those of the other age groups. Burris et al.[46] (2009) found no significant difference in university students' psychological well-being by age, and they suggested that this may have been due to the characteristics of their sample. This study found that the students who engaged in sports, who worked out in their free time, who did regular physical activity and whose phys-

Table 5. The students' mean Psychological Well-being Scale scores, social relationships, psychological states, stress and physical activity levels

Variables	Total mean PWBS score		Statistics
	Mean	SD	
Family relationships*			
Bad, very bad (a)	29.25	7.86	Kwχ²=76.629
Moderate (b)	34.06	9.83	p<0.0001
Good (c)	39.68	7.62	
Very good (d)	42.47	7.14	
Relationship with friends*			
Bad, very bad (a)	26.31	10.49	Kwχ²=92.305
Moderate (b)	35.10	8.04	p<0.0001
Good (c)	39.92	7.54	
Very good (d)	43.13	7.14	
Psychological states*			
Bad, very bad (a)	31.51	8.95	Kwχ²=148.767
Moderate (b)	37.77	8.03	p<0.0001
Good (c)	42.64	6.15	
Very good (d)	45.33	6.59	
Stress levels*			
Low stress levels	43.81	8.28	Kwχ²=48.173
Moderate stress levels	41.77	6.97	p<0.0001
Too much stress	37.76	8.77	
MET physical activity levels			
Inactive*	38.37	8.27	Kwχ²=15.575
Minimally active	40.16	8.04	p<0.0001
Sufficiently active*	42.06	8.10	

Kwχ²: Kruskal-Wallis; SD: Standard deviation.

ical activity levels were high had higher mean psychological well-being scores (p<0.05). Like this study, other studies have found that regular physical activity increases happiness and social interaction, reduces depression and increases psychological well-being.[47,48] In this study, the students who were active in their free time had higher psychological well-being scores than the students who were not, and this difference was statistically significant (p<0.05). Hwang and Oh[49] (2013) determined that listening to music and playing musical instruments reduced depression and stress scores, and increased psychological well-being. The results of this study supports their results. This study determined that the students who had higher psychological well-being scores had lower insomnia rates. Like this study, Steptoe et al. (2008) found that higher psychological well-being and level of welfare have a positive effect on sleep.[34] This study determined that good family and friend relationships and spending free time with friends and family had a positive effect on psychological well-being scores. Other studies have also determined that positive relationships with friends and family provide social support to students and increase their happiness and psychological well-being.[50,51] In this study, the mean psychological well-be-

ing scores of the students who had too much stress were lower. Like this study, Branström et al.[52] (2011) found that stress negatively affected 18–60 year olds' psychological well-being. In this study, the students who reported that their psychological state was good and who did not have a diagnosed psychological illness had higher mean psychological well-being scores. Studies have found that university students are a high-risk group for mental illnesses, and that obsessive-compulsive disorders, depression, anxiety, eating disorders and sleep disorders are commonly seen among them. Psychiatric illnesses negatively affect university students' psychological well-being and need to be treated.[53,54] The results of this study support those of previous studies.

Limitations

The study was carried out in two faculties of a university. Its results can only be generalized to these two faculties.

Conclusion

The majority of students were minimally active. The more

Table 6. The factors associated with insomnia in the logistic regression analysis

Variables	B	Exp(B)	Sig.	95% Confidence interval
Sports	-0.198	0.820	0.389	0.522–1.288
Trip	0.330	1.391	0.104	0.934–2.072
Cinema/theater	0.91	1.095	0.634	0.752–1.595
Spending time with friends and family	0.124	1.131	0.629	0.686–1.868
Family relationship			0.097	
Family relationship (1)	0.672	1.958	0.409	0.397–9.660
Family relationship (2)	-0.019	0.981	0.951	0.538–1.791
Family relationship (3)	0.414	1.512	0.002	1.062–2.153
Psychological state			0.853	
Psychological state (1)	0.332	1.393	0.426	0.616–3.154
Psychological state (2)	0.221	1.247	0.451	0.703–2.211
Psychological state (3)	0.195	1.216	0.461	0.723–2.045
Pain	0.470	1.600	0.028	1.051–2.437
Using phones in bed	0.560	1.760	0.006	1.174–2.639
Stress levels			0.005	
Stress levels (1)	0.460	1.584	0.133	0.869–2.888
Stress levels (2)	0.918	2.504	0.004	1.336–4.690
Sports facilities near place of residence	-0.191	0.826	0.286	0.582–1.173
Psychological Well-being Scale score	-0.028	0.972	0.029	0.948–0.997
Regular physical activity	0.147	1.158	0.921	0.065–20.753
Number of days of physical activity			0.946	
Number of days of physical activity (1)	0.820	2.271	0.611	0.097–53.410
Number of days of physical activity (2)	0.369	1.447	0.599	0.366–5.724
Number of days of physical activity (3)	0.331	1.392	0.627	0.366–5.296
Free time activity	-0.052	0.949	0.852	0.549–1.640

active students included: male students, students who were active in their free time, students who did regular physical activity, students who had overweight and obese BMIs, students who worked out, listened to music, read books, or spent time with their friends and families.

More than half of the students had insomnia. The students who evaluated their psychological state as very bad or bad, who evaluated their family relationships as very bad or bad, who had a constant pain, who had too much stress, who used phones in bed, who were not active in their free time, and who did not do regular physical activity had more insomnia. The students who spent their free time going on trips, working out, going to the cinema or theater watching TV, had higher psychological well-being scores, and spent time with their families and friends had less insomnia.

The students' psychological well-being scores were above average. The mean psychological well-being score of the students who had diagnosed psychological illness, who evaluated their relationships with family and friends, and psychological states as very bad, who had too much stress, who were not active in their free time, who did not do regular physical activity, whose physical activity levels were low, and who had insomnia were lower. The students who worked out, went on trips, read books, listened to music, went to the cinema or the-

ater, watched TV, played musical instruments, and spent time with friends and family had higher PWBS scores.

Although healthcare departments offer detailed courses on physical activity, sleep, and psychology, no significant difference was found in the physical activity levels, insomnia rate and psychological well-being scores of the health sciences students and the students of the faculty of science and letters. This indicates that the health sciences students do not practice what they learn in their daily lives.

Nurses who work with university students should use scales to diagnose their insomnia, physical activity levels and psychological well-being. Brochures and training should be prepared that show the symptoms of insomnia and its negative outcomes, the fact that using phones in bed increased insomnia, and that wakeup times positively affect the quality of sleep. Counseling about coping with stress and improving interpersonal relationship should be provided to students. Activities with the collaboration of student clubs and departments that support social activities such as dance, Pilates, folk dance, yoga, courses for musical instruments, choirs, city trips and nature trips should be organized. Walking trails and sports facilities should be made available on campuses.

In this study, the students were not provided any training or intervention to increase their psychological well-being or re-

duce insomnia. Further interventional research on this subject should be conducted.

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