

Investigation of The Effect of Psychological Adaptation Skills on Sleep Quality: A Study on Students of The Faculty of Sports Sciences

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Abstract

Adequate sleep is vital for individuals. Many factors affect sleep quality. Some of these factors are expressed as depression, anxiety, and stress. The impact of depression, anxiety, and stress on sleep quality is an important issue that needs to be revealed. Therefore, this study aimed to investigate the effect of psychological adaptation skills of Ataturk University and Erzurum Technical University sports sciences faculty students on sleep quality. A total of 358 students, 119 female and 239 male, studying at sports science faculties constitute the sample group. Three parts were used in the data collection process: demographic information form, sleep quality scale, and DAS-21 scale. The relational screening model was used in the research. Findings show that as participants' depression, anxiety, and stress levels increase, their sleep quality scores also increase. Correlation and multiple regression analyses were used in the study. As a result of the correlation and multiple regression analysis, it is seen that psychological adaptation skills positively predict sleep quality. As participants' sleep quality levels increase, their psychological adaptation skills increase.

Keywords: Sleep quality, Depression, Anxiety, Stress

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INTRODUCTION

Sleep is considered a qualitative health variable and provides the individual's quality of life and well-being. Sleep allows the body to rest, strengthens the brain, and allows the person to prepare for the day by correcting and repairing it, while a change in the quality of Sleep causes daily life activities. A person is a whole person with physical, mental, social, intellectual, and spiritual aspects. For a person to be healthy, they need to meet these needs in a balanced way. When the sleep literature is examined, it is seen that there are many terminologies related to its definition. In its simplest definition, Sleep is the existence of all living things and the food of the brain. According to a standard view, Sleep is a state that cannot be awakened by appropriate emotional or various stimuli (Khorshid, 1996). In general, Sleep refers to a state in which the organism loses communication with its environment by recycling intense, temporary, fragmented, and periodic stimuli at various levels (Papilla & Acioglu, 2004). Adequate sleep is as vital as eating and breathing, and insufficient sleep causes deterioration in our physical and mental health (Nsengimana et al., 2023).

Sleep quality represents an individual's satisfaction with all aspects of their sleep experience (Nelson et al., 2022). This concept includes sleep efficiency, latency to sleep onset, duration, and number of awakenings after sleep onset. For adults, 7 to 8 hours of uninterrupted sleep is considered a 'good night's sleep.' Individuals who do not get enough sleep have a higher risk of developing stress, anxiety, and depression (Zou et al., 2020). Lack of sleep can cause fatigue, difficulty concentrating, and impaired cognitive functions (Dyrbye et al., 2014). Research has shown that sleep increases working memory capacity and memory consolidation. A meta-analysis of seventy studies concluded that acute sleep deprivation negatively impacts cognitive domains, including simple and complex attention, working memory, and short-term memory (Alotaibi et al., 2020).

Sleep disturbance is associated with psychological, behavioral, physiological, and environmental factors (Wang et al., 2020). According to the cognitive model of insomnia, negative emotions (mainly depression and anxiety) can trigger people's cognitive biases regarding stressful life events, making them hypervigilant and gradually affecting sleep quality. Stress is a high-risk factor for sleep quality because it affects sleep patterns. Stress disrupts sleep rhythm (low wave and rapid eye movement phases) by reducing sleep efficiency and increasing alertness (Kim & Dimsdale, 2007). Additionally, acute and chronic stress reactions affect cortisol secretion via the hypothalamic-pituitary-adrenal (HPA) axis, further influencing changes in circadian rhythms and sleep quality (Russell & Lightman, 2019). Sleep disorders, as included in Hamilton's severity rating scales, commonly accompany anxiety disorders and depressive illnesses (Hamilton, 1967).

While anxiety states represent an acute response to stress, depression can develop insidiously when stress lasts for a long time, so stress and insomnia are viewed as causally related (Wheatley, 1993). While anxiety causes depression and sleep disturbance are common accompaniments of both, lack

of sleep creates more stress (Mendelson et al., 1984). The immune system may be weakened by insomnia, stressful life events, and depression. The function of sleep is restorative, and when disrupted, physiological and psychological effects can occur (Adam & Oswald, 1983). Insomnia is often caused by stress, and continued lack of sleep further inhibits this stress-coping response. Sleep disturbance is a prominent feature of both anxiety and depression, as shown in a recent study by the Stress Clinic (Wheatley, 1993).

Psychological adjustment is a set of internal psychological outcomes such as depression, anxiety, and stress, which include having a clear sense of individual and cultural identity, good mental health, and satisfaction in the new environment (Searle & Ward, 1990). There is an essential relationship between psychological adjustment skills such as depression, anxiety, stress, and sleep (Kim & Dimsdale, 2007). Psychological adjustment skills such as depression, anxiety, and stress hurt the quality of sleep of individuals as they lead to prolonged sleep latency, waking up very early in the morning, frequent interruptions in night sleep, and, as a result, shortening of sleep duration (Gulec et al., 2012). The amount of sleep needed varies according to age, physical activity, and other factors. The amount of sleep that athletes need each night is considered at least 7 hours, but this figure varies from athlete to athlete. Athletes, compared to non-athletes, require more sleep volume for adequate recovery as a result of their high-intensity training (Marshall & Turner, 2016). However, it is recommended that young athletes who engage in high-intensity training sleep at least 10 hours per night (Calder, 2003). It has been reported that athletes will perform at their best when their general sleep and sleep habits are at optimal levels (Mah et al., 2011). Elite athletes have lower sleep quality than non-elite athletes (Leeder et al., 2012), individual athletes have more sleep problems than team athletes, and sleep disturbances are quite common the day before the competition (Leeder et al., 2012; Walsh et al., 2021). It is known that participation in sports prevents the onset of psychological adaptation skills such as depression, anxiety, and stress disorders (Bantjes & Swartz, 2018). Sports have been reported to positively affect stress, psychological states, fatigue, sleep, and health status (Moses et al., 1989).

Sports science faculty students are exposed to stressful situations during their education due to courses, training, and competitions that require long hours of physical and mental effort, which can lead to a wide range of mental health problems, including anxiety, depression, and post-traumatic stress disorder (PTSD). Mental health disorders and related symptoms are common in individuals involved in sports of all ages and professional levels (Gouttebarga et al., 2019). A recent meta-analysis study found that 26% of current elite athletes had significant stress/distress, 26% had sleep disturbance, and 34% had anxiety and depression (Gouttebarga et al., 2019). Additionally, extreme sleep disturbance has been associated with increased depression in NCAA student-athletes and adolescent athletes in football (Gomes et al., 2017). While it is empirically unclear whether athletes experience more mental health problems than the general population, athletes are vulnerable to acute and chronic stressors (e.g., pressures of competition leading to long-term injury) and other unique factors. This may put them at risk for developing mental health

disorders (e.g., major depressive disorder) or worsening of existing mental health symptoms (e.g., sleep disturbance and anxiety).

Sleep quality is considered very important for students who are exposed to depression, anxiety, and stress due to long-term theoretical and practical training, training, and competitions that require intense physical and mental effort. For this reason, psychological adaptation skills should be screened in sports sciences faculty students, and the effect of sleep quality on psychological adaptation skills should be investigated. This study aimed to examine the effect of psychological adaptation skills of sports sciences faculty students on sleep quality. Hypothesis: The working hypothesis is that sleep quality has a negative effect on psychological adaptation skills. It is thought that as the sleep quality levels of the participants decrease, their psychological adaptation skills will increase.

METHOD

Research Model

A relational screening model was used in the research. Relational screening model; “It is a research model that aims to jointly determine the existence or change between two or more variables” (Fraenkel et al., 1993).

Research Group

The research population comprises students from the sports science faculties. The sample group consists of students studying at the Faculty of Sports Sciences of Atatürk University and Erzurum Technical University. A total of 358 students participated in the research. The participants are 239 men and 119 women. Among the participants, 159 are in the first grade, 78 in the second, 50 in the third, and 71 in the 4th grade. Participants were selected by random sampling method. The data collection process was carried out through measurement tools physically prepared for the participants. In this context, data was collected from a total of 358 students.

Data Collection Tools

In this research process, data collection tools with proven validity and reliability were used in line with the purposes of the research. Introductory information about these measurement tools is presented below.

Depression, Anxiety, Stress (DASS 21) Scale: The DASS 21 scale was used to determine the depression, anxiety, and stress levels of sports sciences faculty students. This scale is a measurement tool used to determine the depression, anxiety, and stress levels of participants. The short form of the scale was developed by Henry and Crawford (2005). The reliability and validity study of the short form was conducted by Yılmaz et al. (2017). DASS 21 consists of a total of 21 items: depression (7), anxiety (7) and stress (7). The Cronbach's Alpha (α) value for the depression

dimension of the scale was found to be .819, the Cronbach's Alpha (α) value for the anxiety dimension was found to be .808 and the Cronbach's Alpha (α) value for the stress dimension was found to be .755. In this study, the Cronbach's Alpha (α) value for the depression dimension of the scale was found to be .931, the Cronbach's Alpha (α) value for the anxiety dimension was found to be .898 and the Cronbach's Alpha (α) value for the stress dimension was found to be .830.

Pittsburgh Sleep Quality Index (PSQI): PSQI Busee et al. (1989), and its Turkish validity and reliability study conducted by Ağargün et al. (1996), is a measurement tool that evaluates sleep quality over one month. In the PSQI evaluation, 18 items are included in the scoring. PSQI consists of 7 components: subjective sleep quality, latency, duration, habitual sleep efficiency, sleep disturbance, use of sleeping pills, and daytime dysfunction. Each item is evaluated between 0-3 points. A total score between 0-21 is obtained from 7 components. A total PSQI score of ≤ 5 indicates "good sleep quality," and a score >5 indicates "poor sleep quality." In the development of the sleep quality scale, the increase in the sleep quality scores of the participants indicates that they have poor sleep quality. Cronbach Alpha (α) value was determined as 0.80 (Ağargün et al., 1996). In this study, the Cronbach Alpha (α) value of the scale was determined as 0.89.

Ethical Approval

Ethics committee approval was received by the "Ataturk University Rectorate, Faculty of Sports Sciences Deanship" with the decision numbered E-70400699-000-2400210446 dated 01/07/2024-61.

Collection of Data

The research process started with approval from the Atatürk University Faculty of Sports Sciences Ethics Committee for the research suitability. Data were collected using physical tools. Physically prepared tools were filled out face to face by students at Atatürk University and Erzurum Technical University Faculties of Sports Sciences. A random sampling method was used in the data collection process, and an attempt was made to reach many students in the sports sciences faculty. Voluntariness was taken as the basis for participation in the research. Explanations were made that there was no personal information about the participants in the data collection tools, that the information regarding their opinions would be confidential, and that they could give up filling out the data collection tools at any time.

Analysis of Data

G*Power analysis, which is frequently used in sample selection in the field of social sciences, and methods of reaching at least 10 times the number of participants as the scale items used in the research were used (Akgül, 2005). When the number of items was taken as a basis, it was revealed that 300 participants, ten times the number of 30 items, was sufficient for the research. It was seen that 358 students reached through random sampling were sufficient for the conduct of the research. Correlation and regression analyses were conducted with SPSS software.

FINDINGS

Table 1. Correlation results between participants' depression, anxiety, stress and sleep quality

		1	2	3	4
1- Depression	r	1			
	p	-			
	n	358			
2- Anxiety	r	.551**	1		
	p	.000	-		
	n	358	358		
3- Stress	r	.581**	.550**	1	
	p	.000	.000	-	
	n	358	358	330	
4- Sleep Quality	r	.462**	.381**	.336**	1
	p	.000	.000	.000	-
	n	358	358	358	358

n=358, **p<0.001

When Table 1 is examined, it can be seen that there is a positive moderate difference between the participants' depression levels and anxiety levels ($r = .551$, $p < .05$), a positive moderate difference between the depression levels and stress levels ($r = .581$, $p < .05$). There was a positive moderate level between anxiety levels and stress levels ($r = .550$, $p < .05$), a positive moderate level between depression levels and sleep quality ($r = .462$, $p < .05$), a positive moderate level between anxiety levels and sleep quality ($r = .381$, $p < .05$) and a positive, moderately significant relationship between stress levels and sleep quality ($r = .336$, $p < .05$).

Table 2. Levels of variables predicting sleep quality level

R	R ²	Corrected R ²	Pre. Std. error
.488	.238	.231	2.011

As a result, it was seen that these variables explained 23.8% of the total variance in sleep quality.

Table 3. B and beta correlation coefficients and significance levels of variables

Predictors	B	Std. error	β	t	p
(Constant)	5.473	.298		18.381	.000
Depression	1.201	.184	.362	6.522	.000
Anxiety	.655	.200	.182	3.270	.001

When Table 2 and Table 3 were examined, it was determined to what extent depression and anxiety variables predicted sleep quality by applying linear multiple regression, and as a result of this process, $R = .488$, $R^2 = .238$. As a result, it was seen that these variables explained 23.8% of the total variance in sleep quality. As a result of the analysis, it was determined that the effect size was high. Stepwise regression was used to determine the independent variables that significantly contributed to the prediction of sleep quality and the contribution of these independent variables to the total variance explained in the prediction of sleep quality. The results are shown in Tables 4 and 5.

Table 4. Stepwise regression analysis results on sleep quality

Model	R	R ²	Corrected R ²	Pre. Std. Error
1	.462	.214	.212	2.036
2	.487	.238	.232	2.009

Table 5. B and beta correlation coefficients and significance levels of variables

Model	Predictors	B	Std. Error	β	t	p
1	(Constant)	5.967	.260		22.941	.000
	Depression	1.532	.156	.462	9.838	.000
2	(Constant)	5.473	.298		18.381	.000
	Depression	1.201	.184	.362	6.522	.000
	Anxiety	.655	.200	.182	3.270	.001

When Table 4 is examined, the depression regression equation is entered, and it is seen that 21.4% of the variance in sleep quality is explained by the depression variable (R=.462, R²=.214). In other words, the depression variable is the strongest predictor of the sleep quality variable. The positive (+) beta value direction shows that there is a positive relationship between depression and sleep quality; increasing sleep quality scores also causes an increase in depression scores. After the depression variable, the anxiety variable is added to the model, and with the addition of this variable to the model, the explained variance in sleep quality score increased from 21.4% to 23.7% (R=.487, R²=.237). In other words, the anxiety variable contributes approximately 23.7% to the explained variance.

When Table 5 is examined, the Beta value of the anxiety variable (.182) shows that the relationship between anxiety and sleep quality is positive, and the sleep quality score increases as the anxiety score increases. The independent variable stress was removed from the model because it did not significantly predict the level of sleep quality.

DISCUSSION AND CONCLUSION

All levels of sports education leave individuals alone with intense physical and mental effort. These long-term training and the physical and mental efforts that must be given due to the nature of sports cause individuals to be exposed to psychological adaptation skills such as depression, anxiety, and stress. This situation is considered very important in terms of individuals' sleep quality. Therefore, it is necessary to screen psychological adaptation skills and sleep quality levels in sports science faculties where sports education is provided and to examine the effect of sleep quality on psychological adaptation skills. This study examined "the effect of psychological adaptation skill levels of sports science faculty students on sleep quality." It was determined that there was a positive relationship between the depression, anxiety, and stress levels of the participants and their sleep quality levels. In the development of the sleep quality scale, the

increase in the sleep quality scores of the participants indicates that they have a poor level of sleep quality. Therefore, the positive relationship between sleep quality and depression, anxiety, and stress levels suggests that depression, anxiety, and stress levels increase as the sleep quality score increases. In the study, it was seen that the independent variables (depression and anxiety) predicted 23.7% of the total variance of sleep quality, which was determined as the dependent variable. It was determined that the variables depression and anxiety made the most significant contribution to the total variance, respectively. The independent variable stress was removed from the model because it did not significantly predict the level of sleep quality.

When the study findings are examined, it is seen that there is a positive relationship between the participants' sleep quality levels and psychological adaptation skills. An increase in the participants' sleep quality levels (increased scores from sleep quality levels indicate that they have poor sleep quality) decreases their psychological adaptation skill levels. When the literature is examined, Anshel and Anderson (2002) stated in their study on athletes that they are generally more successful in coping with negativity, more effective in regulating emotions, and probably effectively learn how to deal with distracting stress factors. Factors such as sleep problems, depression, anxiety, and stress seen in athletes cause decreases in self-esteem and decreased performance (Nixdorf, 2018). Sleep quality is very important for athletes in order to protect themselves from psychological adaptation skills such as depression, anxiety, and stress. Işık et al. (2015) stated in their study that sleep quality has a significant effect on physical activity level and depression score averages. Roveda et al. (2011) stated that exercise increases sleep quality and duration. Faria et al. (2009) It was stated that endurance exercises on sedentary individuals were effective on sleep quality parameters and positively affected sleep. In the study conducted by King et al. (1997), it was reported that exercise activity increased sleep quality. In light of these results, it can be said that physical activity has a decisive effect on sleep quality. Studies have shown that people who do sports can have better quality and longer sleep duration than sedentary people (Fullagar et al., 2015). Insomnia causes factors such as depression, anxiety and stress in athletes (Bonnet, 1985). It has been observed that three hours of physical activity per week helps prevent the onset of negative emotional states such as depression, anxiety and stress (Windt et al., 2015). In the study conducted by Yüceant (2023), it was concluded that depression, anxiety and stress levels decreased after the participants were made to do physical activity. In the study conducted by Yüceant (2022) on tennis players, it was concluded that there was a negative correlation between the depression, anxiety and stress levels of individuals who played tennis regularly and their psychological well-being. These results show that sports reduce psychological adaptation skills such as depression, anxiety and stress and help increase well-being levels (Borland et al., 2022).

Studies have reported that anxiety and depression have a clinically significant effect on sleep quality during the pandemic in adults (Batoool-Anwar et al., 2023). Depression symptoms have been shown to reduce sleep quality in medical students (Li et al., 2020). Emotional states can negatively impact sleep quality, and sleep problems can worsen mental health problems. Sleep

“disorders” are considered a correlate or risk factor as there are several mental health disorders, and more significant numbers and more severe sleep “disorders” are associated with higher levels of anxiety, stress, fatigue, pain intensity, and quality of life in athletes (Gomes et al., 2017). The relationship between stress, anxiety, depression, and poor sleep quality has been highlighted in several studies published among health students (Zhang et al., 2018). A study conducted among nursing students concluded that poor sleep quality is associated with symptoms of stress, depression, and anxiety. In their study on 284 medical faculty students, Mishra et al. (2022) found that stressed students had twice the poor sleep quality compared to those without stress (Mishra et al., 2022). Another study concluded that higher levels of perceived stress were significantly associated with poor sleep quality (Lee et al., 2022). In a study of 1,125 college students ages 17 to 24, more than 60% of participants were classified as poor sleepers. According to data obtained from students, it was concluded that anxiety and stress were significantly associated with sleep disorders (Lund et al., 2010). Another study states that high-stress levels are directly linked to poor sleep quality (Calderon Jr et al., 2021).

Research shows that individuals with psychiatric disorders such as anxiety and depression are three times more likely to have sleep problems than young people without psychiatric problems. Epidemiological studies examine the relationship between sleep problems (difficulty falling asleep and staying asleep) and depression in young individuals aged 21-30, revealing that sleep problems are seen at a rate of 50-60% in this age group (Dinis & Bragança, 2018). Additionally, it has been found that in people experiencing high levels of stress and anxiety, circadian and ultradian rhythms become out of sync, and sleep-wake cycles are disrupted due to increased cortisol levels due to neuroendocrine dysregulation. (Holsboer & Ising, 2010). In a comprehensive screening study conducted by Fernando et al. (2013), it was determined that 44.8% of students with sleep problems had anxiety and that there was a moderate relationship between sleep problems and anxiety. In parallel with this study, a moderate relationship was detected between sleep quality and anxiety in our research, and it was concluded that anxiety is a parameter that significantly affects sleep quality. In a study conducted by Latif et al. (2019) based on a healthy sample, it was observed that as emotional expression suppression and negative emotions increased, sleep quality measured by PSQI decreased. Similarly, sleep problems increase negative emotions (Bouwman, 2017). Although there is no consensus on the relationship between negative emotions and sleep quality or sleep problems, as sleep efficiency decreases, significantly as amygdala activity increases, difficulties in regulating emotions and responding to stressful situations increase. This can be seen as a decrease in positive emotional symptoms and an increase in negative emotions in individuals. As a result, an increase in depressive symptoms and anxiety levels can be observed (Prather et al., 2013). In a study conducted by Babson et al. (2010) on sleep-deprived participants, it was found that state anxiety and depression scores were higher in the sleep-deprived group compared to the control group sleeping at average sleep time. It has been found that students with very high levels of depression have lower sleep quality, longer sleep duration, and more frequent night wakings compared to students with low levels of depression (Moo-Estrella et al., 2005). Another study in this area showed that in adults followed for 12 months, insomnia symptoms recorded at initial

measurements were associated with anxiety, depression, and generalized symptoms in subsequent months (Morphy et al., 2007). It has been stated that daily stress and negative emotions have an impact on sleep patterns and rest, and it has also been stated that disruptions in sleep quality are positively associated with depression and anxiety (Fidantek et al., 2022). In this context, it has been concluded that developing individuals' coping skills in coping with negative emotional states is necessary for sleep quality and mental health to maintain the sleep pattern that significantly affects the quality of life.

This study has some limitations. All participants in this study were recruited from the Eastern Anatolia Region. Whether different cultural backgrounds influence the result reported here needs further investigation. This study is only cross-sectional, and more experimental or interventional studies are needed to test its results. As a result, it was concluded that sleep quality positively affects psychological adaptation skills. It is observed that as the sleep quality levels of the participants increase, their psychological adaptation skill levels also increase. A high score obtained from sleep quality means that sleep quality is poor. It was concluded that poor sleep quality increases the psychological adaptation skill levels of the participants. Fidantek et al. (2022) showed that deteriorations in sleep quality are positively correlated with depression and anxiety. In this context, it was concluded that to maintain regular sleep, which is a factor that significantly affects the quality of life, the development of individuals' coping skills is of critical importance for the mental health of individuals. Studies can be conducted on different sample groups to reveal the relationship between sleep quality and psychological adaptation skills. Studies can be undertaken to demonstrate the effect of sleep quality on various dependent variables. Studies can be conducted to reveal the importance of the relationship between sleep and psychological adaptation skills among participants who do active sports and those who live a sedentary life.

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Ethical Approval

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