Education and Science

Original Article

Vol 48 (2023) No 215 95-111

The Relationship between Academic Stress and Sleep Quality in Adolescents: The Mediating Role of School Burnout and Depression

Selim Gündoğan [1]

Abstract

This study examines the mediating role of school burnout and depression in the relationship between academic stress and sleep quality. The participant group of the study consists of 353 adolescents between the ages of 13-18 who are continuing their high school education (185 girls and 158 boys). The study data were collected using the Academic-Based Stress Inventory, Sleep Quality Scale, School Burnout Scale, and Kutcher Adolescent Depression Scale. Correlation analysis, confirmatory factor analysis (CFA), and structural equation modeling (SEM) were used to analyze the data. The results from testing the model have confirmed the tested mediation model. The study has found academic stress, depression, and school burnout to have direct effects on sleep quality, with academic stress also having an indirect effect on sleep quality through school burnout and depression within the scope of a model. The study also discusses the results in line with the obtained findings and makes suggestions for the literature.

Keywords

Academic stress
Sleep quality
School burnout
Depression
Adolescence
Model test

Article Info

Received: 12.21.2021
Accepted: 03.27.2023
Published Online: 07.28.2023

DOI: 10.15390/EB.2023.11497

Introduction

Adolescence is a challenging period in which individuals experience serious physical, mental, and psychological changes (Santrock, 2012). Adolescence results the adolescent individual experiencing both mental and physical challenges. Paying attention to adolescent individuals' physical and mental health is important in this period (Kaltiala-Heino, Marttunen, Rantanen, & Rimpelä, 2003). Getting regular and healthy sleep has been suggested as one of the physical and mental needs to which an adolescent individual should pay attention (Şenol, Soyuer, Akça, & Argün, 2012; Şimşek & Tekgül, 2019). Therefore, sleep quality is an important issue not just for adults but also for adolescents (Gregory & Sadeh, 2012).

Sleep quality relates to how well an individual feels rested, fit, and ready to start a new day after waking up (Şenol et al., 2012). Krystal and Edinger (2008) defined sleep quality as sleeping without interruption, getting good sleep, and waking up rested. Accordingly, healthy sleep directly reflects on individuals' daily performance. Sleep is claimed to be important in many areas of human life (Jacoby, Snape, Lane, & Baker, 2015). For example, regular sleep has been suggested to have positive effects on an individual's academic, work, and daily life (Haun & Oppenauer, 2019). Healthy sleep for an individual in adolescence is considered to provide important contributions to helping the individual

[1] Niğde Ömer Halisdemir University, Faculty of Education, Department of Educational Sciences, Turkey, selimgundogan@ohu.edu.tr

more effectively cope with the problems in adolescence, which is a challenging process (Kansagra, 2020). Thus, focusing on the factors that affect adolescents' sleep positively and negatively can be said to be important.

Many factors are found to negatively affect the quality of adolescents' healthy sleep (Lang et al., 2013; Liu et al., 2018). Previous studies have shown environmental and individual factors to affect sleep quality both positively and negatively. Studies have found factors such as a noisy environment (Borji, Otaghi, Salimi, & Sanei, 2017), being tired (Shim & Kang, 2017), using any substance such as cigarettes or alcohol (Aysan, Karaköse, Zaybak, & İsmailoğlu, 2014), and psychological problems (Seun-Fadipe & Mosaku, 2017) to have a negative impact on sleep quality. Problems experienced in school-related processes or difficult education-related processes also negatively affect adolescents' quality of sleep (Hoefelmann, da Silva Lopes, da Silva, Moritz, & Nahas, 2013). Studies in the literature have suggested school burnout, which has been the subject of research in recent years, to have a negative effect on students' quality of sleep and sleep patterns (Evers, Chen, Rothmann, Dhir, & Pallesen, 2020). In this context, one can argue that different problems in the school context (e.g., school burnout, academic stress) that students experience during education are among the factors that disrupt students' sleep and negatively affect their quality of sleep. School burnout relates to the exhaustion students feel due to the high level of stress they experience as a result of expectations from school, feelings of inadequacy, and cynical attitudes they develop toward school (Salmela-Aro, Kiuru, Pietikäinen, & Jokela, 2008). In addition, Aypay (2011) expressed school burnout as the burnout students feel as a result of the intense expectations from school regarding academic activities. Studies have concluded school burnout as a condition seen in students to negatively affect their quality of sleep (Arbabisarjou et al., 2016; Lehto, Kortesoja, & Partonen, 2019; May, Bauer, Seibert, Jaurequi, & Fincham, 2020; Liu, Zhang, Wu, Yang, & Liang, 2021). Accordingly, the sleep of students who experience intense school burnout are also adversely affected by this situation. School burnout has also been suggested to cause students to experience various psychological problems (Aypay, 2017; Smith & Emerson, 2021). In the literature, studies have stated depression to be one of the psychological problems students experience due to school burnout (Collin, O'Selmo, & Whitehead, 2020). Studies in the literature have also found school burnout to cause depression (Fiorilli, De Stasio, Di Chiacchio, Pepe, & Salmela-Aro, 2017; May, Bauer, & Fincham, 2015; Salmela-Aro, Upadyaya, Hakkarainen, Lonka, & Alho, 2017; Seçer, 2015). School burnout causes students to wear out and experience psychological problems such as depression because of how it negatively affects the resources a student has for coping with a problem (Thompson, McBride, Hosford, & Halaas, 2016). Therefore, when considering the negative psychological effects school burnout has on students, one can be argue multidimensional research to be important. Moreover, focusing on preventive studies for certain problems such as school burnout in education can also be said to be important.

Studies in the literature have been reported that, just as school burnout causes depression in adolescents, so does depression cause adolescents to experience sleep problems and complicate the sleep process (Alfano, Zakem, Costa, Taylor, & Weems, 2009; Przepiorka & Blachnio, 2020). Because individuals experience feelings of hopelessness and pessimism more intensely when depressed, this negative mental state causes healthy sleep to become more difficult (Sivertsen, Harvey, Lundervold, & Hysing, 2014). Studies in the literature have also found depression to negatively affect the quality of sleep (Pensuksan et al., 2016; Becker, Jesus, Joao, Viseu, & Martins, 2017; Wang, Xiao, Zhang, & Wang, 2020). In this context, one of depression's negative effects impacts good sleep. The sleep of adolescents who frequently experience depression is interrupted more frequently, and therefore their quality of sleep also decreases (Woods & Scott, 2016).

Academic stress occurs frequently in adolescents during their student life and has also been reported in addition to depression to negatively affect their quality of sleep (Wunsch, Kasten, & Fuchs, 2017; Zhang, Yan, Shum, & Deng, 2020). Academic stress relates to stressful situations that occur as a result of the different tasks and responsibilities students take on in their ongoing education (Bedewy & Gabriel, 2015). Academic stress arises when students feel they do not have enough time to fulfill an

assignment or task and increases the likelihood that different problems will emerge in students (Misra & McKean, 2000). Quality of sleep is seen to be one of the situations academic stress negatively affects. The results from studies in the literature have shown academic stress in students to negatively affect quality of sleep (Ahrberg, Dresler, Niedermaier, Steiger, & Genzel, 2012; Almojali, Almalki, Alothman, Masuadi, & Alaqeel, 2017; Bae, Kang, & Lee, 2020; Benavente, Silva, Higashi, Guido, & Costa, 2014; Caldwell, Harrison, Adams, Quin, & Greeson, 2010). Broken sleep occurs due to the academic stress students experience at school causing them to be too preoccupied with problems at school or to be unable to find solutions to these problems (Buzek et al., 2019; Deng, Zhang, Cao, & Yin, 2021). Having broken sleep or going to bed late and getting up early negatively affect the quality of sleep.

Academic stress causes students to experience problems related to learning in their academic life. The stressful situations students experience during education increase school burnout (Salmela-Aro & Tynkkynen, 2012; Walburg, 2014). Previous studies have revealed academic stress to positively impact school burnout (Backović, Ilić Živojinović, Maksimović, & Maksimović, 2012; Jung, Kim, Ma, & Seo, 2015; Jiang, Ren, Jiang, & Wang, 2021). Students who experience academic stress also undergo negative physical and mental changes (Stoliker & Lafreniere, 2015). These negative situations wear out student's own resources, thus causing them to experience feelings of fatigue and boredom more intensely during school (Veyis, Seçer, & Ulas, 2019). In this context, one can argue student fatigue due to academic stress to result in school burnout.

Academic stress causes students to experience psychological problems as well as school-related problems (Michie, Glachan, & Bray, 2001; Yusoff, Hadie, & Yasin, 2021). Kumaraswamy (2013) claimed depression to be one of the negative situations students' academic stress causes. Different physical and mental reactions may develop in students who experience academic stress (Prabu, 2015), with depression due to the student's mental state being seen as one of these reactions. Students who experience intense academic-based stress during schooling experience depression more intensely than those who experience less stress. Studies in the literature have found academic stress to cause as well as trigger depression (Ang & Huan, 2006a; Eremsoy, Çelimli, & Gençöz, 2005; Jayanthi, Thirunavukarasu, & Rajkumar, 2015; Lee & Kim, 2016).

This Study's Significance and Aim

Adolescence is a critical period in human life, and adolescents face many problems during this period. These problems can be related to schooling, as well as to environmental or individual factors. Sleep-related problems are noteworthily one of the common problems seen in adolescence. Studies have reported between 25%-50% of adolescents to have sleep problems (Gaina et al., 2007; Liang, Guo, Huo, & Zhou, 2021; Oginska & Pokorski, 2006; Roeser, Eichholz, Schwerdtle, Schlarb, & Kübler, 2012). Studies in the literature have shown school burnout and academic stress to be among the school-related factors and depression as a psychological issue that make maintaining healthy sleep difficult for adolescents and that negatively affect their quality of sleep.

While studies have generally dealt with bilateral relations quality of sleep has with academic stress, school burnout, and depression, only one study is found to have dealt with these four variables holistically. Yan, Lin, Su, and Liu (2018) examined whether school burnout and depression play a mediating role in the relationship between academic stress and sleep quality in a model on Chinese adolescents. Their study concluded the model to be valid. Adolescents in Turkish culture also experience problems related to school burnout (Aypay, 2017), academic stress (Veyis et al., 2019), depression (Karadağ, 2020), and sleep quality (Tuncay & Göger, 2022). However, which factors play roles on which other factors has noteworthily not been examined. In this context, examining the indirect effects of academic stress on quality of sleep through school burnout and depression in addition to the direct effects will contribute to filling in an important gap in the literature. In addition, examining whether Yan et al.'s (2018) model can be confirmed with regard to adolescents in Turkish culture is thought to be important, to shed light on new research to be carried out, and to contribute to the generalizability of the model from a scientific point of view. The fact that this model has not been tested on students in Turkish culture can be said to constitute the original value of the study. In addition, the

findings of the study are thought will shed light on preventive and interventional guidance and psychological counselling activities for reducing and improving adolescents' sleep problems. Moreover, the study is thought to be able to be a guide for what can be done to help students cope with this problem while in school. In this context, the aim of this study is to examine the mediating role of school burnout and depression in the relationship between academic stress and sleep quality in adolescents. Within the scope of this main purpose, the study also examines whether school burnout has a predictive role on quality of sleep and depression, whether depression has a predictive role on sleep quality, and whether academic stress has a predictive role on school burnout, depression, and sleep quality. Figure 1 presents the model of the study's hypotheses.

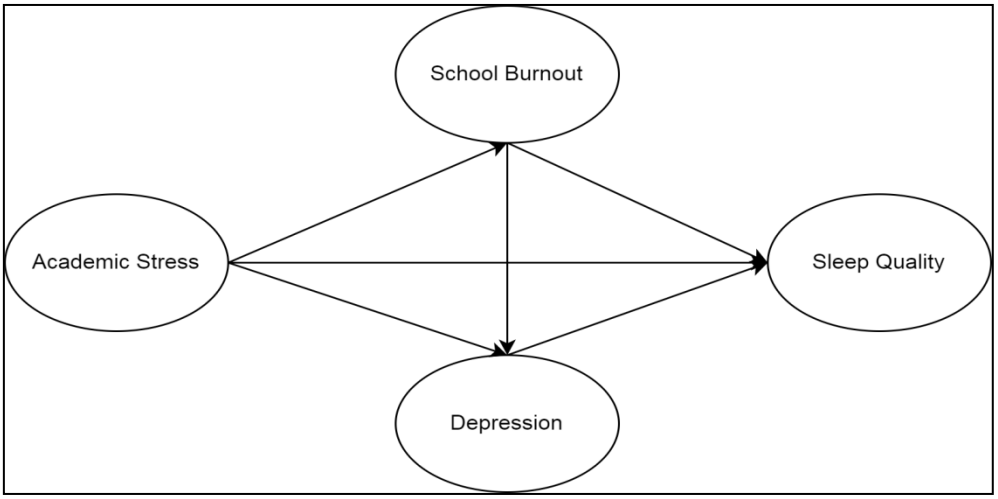

Figure 1. The study's hypothetical model.

Method

This study examines whether school burnout and depression play a mediating role in the relationship between academic stress and sleep quality in adolescents and is as a relational model, which is a quantitative research method (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz, & Demirel, 2012).

Study Group

This study consists of 63 (17.80%) 9th graders, 109 (30.90%) 10th graders, 73 (20.70%) 11th graders, and 108 (30.60%) 12th graders whose ages range from 13-18 years old. The sample of the study consisted of 353 adolescents, of whom 185 (52%) are girls and 168 (48%) are boys.

Data Collection Tools

This study uses scales for which reliability and validity studies had been previously conducted. In addition, the study also calculates within its scope the Cronbach's alphas for the scales and also performs confirmatory factor analyses (CFAs). In this way, the study reperforms the scales' reliability and validity analysis. The study then goes on to collect its data using the Stress Inventory on Academic Expectations, the School Burnout Scale, the Kutcher Adolescent Depression Scale, and the Sleep Quality Scale, information for which is given below, respectively.

Stress Inventory on Academic Expectations (SIAE): The SIAE was developed by Ang and Huan (2006b) to determine the academic-based stress that middle and high school students experience during education. The scale is a 5-point Likert-type measurement tool consisting of 9 items and 2 sub-dimensions (i.e., family/teacher expectations and self-expectations). The Turkish adaptation of the scale was made on high school students by Kelecioğlu and Bilge (2009), who resultantly found Cronbach's alpha values to vary between .74 and .90 and the retest coefficients to vary between .77 and .85. Within the scope of this study, Cronbach's alpha for the scale was calculated as .86 (see Table 1), with the CFA results shown in Table 2.

School Burnout Scale (SBS): Salmela-Aro, Kiuru, Leskinen, and Nurmi (2009) developed SBS to determine the school burnout students experience during education. SBS is a 9-item 5-point Likert-type scale consisting of three dimensions: emotional exhaustion, depersonalization, and low personal achievement. Seçer, Halmatov, Veyis, and Ateş (2013) performed SBS' Turkish adaptation and found the three dimensions to explain a total of 66.85% of the variance as a result. They calculated the reliability of the scale as .87 and the test-retest reliability as .88. In addition, the fit values resulting from the CFA met the desired criterion (*RMSEA* = .042, *RMR* = .013, *NFI* = .90, *CFI* = .96, *IFI* = .97, *RFI* = .92, *AGFI* = .90, *GFI* = .92). The current study has calculated Cronbach's alpha for the scale as .87 (see Table 1), with the CFA results shown in Table 2.

Kutcher Adolescent Depression Scale (KADS): Various forms of KADS have been developed (Brooks, Krulewicz, & Kutcher, 2003; LeBlanc, Almudevar, Brooks, & Kutcher, 2002), with Brooks (2004) having prepared an 11-item form to determine adolescent depression. KADS is a 5-point Likert-type measurement tool consisting of 11 items and one dimension. KADS' Turkish adaptation was carried out by Balcı-Çelik and Uysal-Atabay (2019) on Turkish high school students, and their results show the one dimension to explain 61.60% of the total variance and Cronbach's alpha to be .82. In addition, the fit values meet the criterion ($\chi 2$ / *df* = 1.38, *TLI* = .95, *CFI* = .96, *RMSEA* = .05). The current study calculated Cronbach's alpha as .89 (see Table 1), with Table 2 showing the CFA results.

Sleep Quality Scale (SQS): The SQS was developed by Meijer and van den Wittenboer (2004) to determine children's quality of sleep. The scale is a Likert-type measurement tool consisting of 7 items in one dimension. The Turkish version of the scale was prepared by Önder, Masal, Demirhan, Horzum, and Beşoluk (2016) on adolescents. As a result of the adaptation, they found 38.05% of the total variance to be explained by the one dimension and Cronbach's alpha to be .72. In addition, the fit values also met the criteria ($\chi 2$ / *df* = 3.29, *RMSEA* = 0.068, *NFI* = 0.95, *NNFI* = 0.95, *SRMR* = 0.04, *GFI* = 0.98, *AGFI* = 0.95,

CFI = 0.97). This study calculated Cronbach's alpha for the scale as .74 (see Table 1), with the CFA results shown in Table 2.

Procedure

Before starting the research, an ethics report was first obtained from the ethics committee indicating the study to be ethically appropriate. Next, permission was obtained from the provincial Directorate of National Education for collecting data. The next stage saw the data collected within the scope of the research from adolescents attending high school who'd voluntarily agreed to participate in the research. To reflect the universe well, high schools with three different characteristics were identified: those that admit students based on exams, those that admit students based on address, and vocational high schools. The researcher contacted the students and explained the purpose of the research. The students were told that their participation was voluntary and that they could withdraw from the research at any time. A total of 360 students from the three high schools participated in the study voluntarily. Seven students were determined to have not filled out the scales completely or sincerely, and the data from these students were removed from the data set. Thus, the study was carried out over 353 students.

Data Analysis

Before analyzing the data, the study tested the data for normal distribution and outliers. No data were determined to disrupt normality or show extreme values. The study checked some preliminary assumptions (Bayram, 2010; Kline, 2015) before testing the model.

The model was tested using structural equation modeling (SEM) analysis. SEM analysis is a very general statistical modelling technique widely used in the behavioral sciences and involves a combination of factor, regression, and path analyses (Hox & Bechger, 1998). In this context, SEM is considered to be a more comprehensive and advanced statistical method (Kline, 2015). Before testing the model, the study examined the relationships between the correlation analysis and binary variables, as well as whether a multicollinearity problem exists. In order to avoid multicollinearity problems, values less than .90 between the binary variables were taken as the criterion (Pallant, 2013). Having at least 200 samples has been emphasized as important for SEM analysis (Kline, 2015). The sample of 353 people in the present study fulfils this condition. Certain preliminary assumptions needed to be tested before the SEM analysis (Bayram, 2010; Kline, 2015). Firstly, SEM analysis should occur once the scales' CFAs and measurement model testing have been done (Bayram, 2010). In this context, the scales' CFAs were conducted and measurement model tested prior to testing the mediation model. The fit values of $\chi 2$ / *df*, *RMSEA*, *SRMR*, *AGFI*, *GFI*, *IFI*, *CFI*, and *TLI* are generally used in SEM analyses and have also been used in this study (Kline, 2015). The study takes criterion values of $\chi 2$ / $df \leq 3$; *GFI*, *IFI*, *CFI*, and *TLI* ≥ .90; *AGFI* ≥.85; and *RMSEA* and *SRMR* ≤ .08 for the fit indices (Kline, 2015; Tabachnick & Fidell, 2013). In addition, bootstrap analysis was used to test whether the direct and indirect effects among the variables were significant in the model being tested (Preacher & Hayes, 2008). The recommended number of 1,000 runs for the Bootstrap method was preferred, and the criterion of having lower or upper limits = 0 at the 95% confidence interval was taken into account in order to evaluate the direct and indirect effects among the variables (Preacher & Hayes, 2008).

Results

This section respectively presents the findings regarding the correlation analysis of the study's variables and the descriptive statistics for the variables, the CFA results for the scales and the measurement model, and the mediation model testing.

Table 1. Findings on Correlation Analysis and Descriptive Statistics

	1	2	3	4	Mean	SD	Skew.	Kurt.	α
1. Academic Stress (AS)	-				28.89	8.07	-.09	-.71	.86
2. School Burnout (SB)	.33**	-			24.83	7.98	.21	-.50	.87
3. Depression (DEP)	.47**	.71**	-		14.96	8.18	.25	-.81	.89
4. Sleep Quality (SQ)	-.39**	-.44**	-.51**	-	14.19	2.21	-.17	.01	.74

**p < .01 (SD = Standard Deviation, Skew. = Skewness, Kurt. = Kurtosis, α = Cronbach's Alpha)

An examination of Table 1 shows academic stress to be positively associated with school burnout (r = .33, p < .01) and depression (r = .47, p < .01) and negatively associated with sleep quality (r = -0.39, p < .01), school burnout to be positively related to depression (r = .71, p < .01) and negatively related to sleep quality (r = -0.44, p < .01), and depression to also be negatively associated with sleep quality (r = -0.51, p < .01). Due to the relationships between the binary variables being less than .90, no multicollinearity issues can be said to be present (Pallant, 2013). In addition, due to the skewness and kurtosis values of the variables ranging between -1.5 and +1.5, the data can be said to show normal distribution (Tabachnick & Fidell, 2013).

Table 2. CFA of the Scales, the Measurement Model, and SEM Result

Fit indices	CFA of the scales				Measurement model	Structural model	Criterion
	SIAE	SBS	KADS	SQS			
χ^2	59.73	58.69	126.49	34.06	512.77	528.142	
p	< .001	< .001	< .001	< .001	< .001	< .001	
df	25	20	44	13	222	224	
χ^2 / df	2.38	2.93	2.87	2.62	2.31	2.35	< 3
AGFI	.93	.92	.91	.94	.86	.86	≥ .85
GFI	.96	.96	.94	.97	.90	.90	≥ .90
TLI	.96	.94	.94	.90	.90	.90	≥ .90
CFI	.97	.97	.95	.93	.91	.91	≥ .90
IFI	.97	.97	.95	.92	.91	.91	≥ .90
RMSEA	.06	.07	.07	.06	.06	.06	≤ .08
SRMR	.03	.04	.04	.05	.05	.05	≤ .08

The study performed CFAs for all four scales used to collect data. Table 2 presents the CFA results for the scales and provides the fit value criteria. The study then tests the measurement model. The fit values for the measurement model were found as $\chi 2$ / df = 2.31, *AGFI* = .86, *GFI* = .90, *TLI* = .90, *CFI* = .91, *IFI* = .91, *RMSEA* = .06, and *SRMR* = .05. The study then tested the mediation model once the scales' CFA results and the measurement model's fit values were shown to meet the criteria, and the findings are presented in Figure 2 and Table 3.

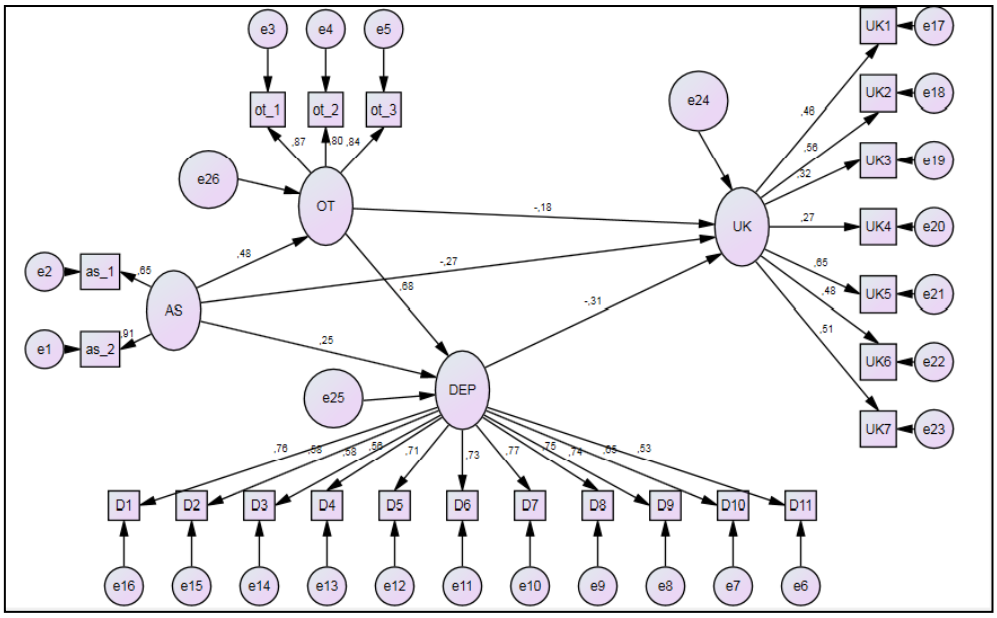

Figure 2. The mediating role of school burnout and depression in the Relationship Between Academic Stress and Sleep Quality (AS = Academic Stress, OT = School Burnout, DEP = Depression, UK = Sleep Quality).

Upon examining Figure 2, school burnout is seen to be a negative (β = -0.18, $p < .05$) predictor of sleep quality and a positive (β = .68, $p < 001$) predictor of depression. Depression is also seen to be a negative (β = -0.31, $p < 05$) predictor of sleep quality. In addition, academic stress appears to be a negative (β = -0.27, $p < 05$) predictor of sleep quality, a positive (β = .48, $p < .001$) predictor of school burnout, and a positive (β = .25, $p < 001$) predictor of depression. The fit values of the tested mediation model were found as $\chi 2 / df = 2.35$, *AGFI* = .86, *GFI* = .90, *TLI* = .90, *CFI* = .91, *IFI* = .91, *RMSEA* = .06, and *SRMR* = .05. These fit values meet the desired criteria values (Kline, 2015; Tabachnick & Fidell, 2013). In accordance with these findings, school burnout and depression are found to have a mediating role in the relationship between academic stress and quality of sleep.

Table 3. Bootstrap Analysis Results Regarding the Direct and Indirect Effects

	β	*SE*	95% Bias Lower Limit	95% Bias Upper Limit
Direct Effect				
SB → SQ	-0.18*	.13	-0.44	-0.09
SB → DEP.	0.68***	.05	0.58	0.77
DEP. → SQ	-0.31*	.16	-0.61	-0.03
AS → SQ	-0.27**	.08	-0.45	-0.11
AS → SB	0.48***	.05	0.37	0.57
AS → DEP.	0.25***	.07	0.12	0.38
Indirect Effect				
AS → SB → DEP. → SQ	-0.26	.06	-0.38	-0.16

*p < .05, **p < .01, ***p < .001. SE = standard error.

Discussion

Adolescence is a period of life period when changes occur and school-related issues and mental problems are frequently experienced. One of the problems adolescents experience in this difficult process involves sleep problems. Accordingly, this study has investigated the effects of academic stress, school burnout, and depression on adolescents' quality of sleep. examining whether school burnout and depression have a mediating role in the relationship between academic stress and quality of sleep in this context.

The study has found school burnout to negatively predict and negatively impact quality of sleep. Studies in the literature also support this result (Arbabisarjou et al., 2016; Evers et al., 2020; Lehto et al., 2019; Liu et al., 2021; May et al., 2020). Both the results of this study and those of previous studies show the school burnout individuals experience during school to also negatively affect individuals' sleep. Therefore, having individuals experience less intense school burnout is also important for healthy sleep. This situation can be interpreted as students who experience school burnout having difficulty maintaining healthy sleep due to the chronic fatigue and intense feelings of exhaustion experienced during education. In addition, problems such as school burnout result in student inattentiveness and causes students to experience negative thoughts more intensely (Anderson, 2000). When considered in this context, individuals whose minds are more preoccupied with negative thoughts have greater difficulty achieving healthy sleep. Another result of the study found school burnout to positively predict depression. The study's findings here are consistent with the findings from previous studies (Fiorilli et al., 2017; May et al., 2015; Salmela-Aro et al., 2017; Seçer, 2015). When considering the results of this study alongside the results of previous studies, school burnout is seen to cause depression and have a triggering effect on depression. Accordingly, one can argue that school burnout has negative effects on students' mental states. In addition, school burnout can be considered to psychologically wear on students due to how it reduces students' own resources such as their ability to coping with problems at school or to exhibit effective performance in school. In this context, school burnout increases mental problems such as depression in students. The results from the present study have also revealed this to be the case.

The present study has also found depression to be a negative predictor of quality of sleep. The findings from other studies in the literature support this result (Becker et al., 2017; Pensuksan et al., 2016; Wang et al., 2020). Moreover, the negative mental states individuals experience also negatively affect their sleep processes (Alfano et al., 2009; Przepiorka & Blachnio, 2020). The results from this study have also shown this. One of the possible consequences of depression in individuals who experience depression is broken sleep (Riemann, Krone, Wulff, & Nissen, 2020). Facing mental problems such as depression and restlessness, as well as intense negative emotions such as fear and anxiety, makes falling asleep and staying asleep difficult for these individuals. Therefore, having adolescents feel psychologically well in terms of regular and healthy sleep processes is an important requirement. The fact that the present study's results found depression to have a negative effect on sleep also reveals this. This study also found academic stress to be a negative predictor of sleep quality, which is also consistent with previous studies (Ahrberg et al., 2012; Almojali et al., 2017; Bae et al., 2020; Benavente et al., 2014; Caldwell et al., 2010). In this context, the situations of academic-based stress individuals experience during education negatively affect their sleep. A student experiencing academic stress feels tense and restless both physically and mentally (Stoliker & Lafreniere, 2015). This negative physical and mental state negatively affects their sleep processes. In addition, because experiencing academic stress negatively affects a student's routines both at school and in daily life, this also negatively affects their quality of sleepy. This study also reached the same conclusion. In this context, one can argue academic stress to have a disruptive role regarding an individual's sleep pattern and to make maintaining healthy sleep difficult.

The current study has found academic stress to positively predict school burnout. Studies in the literature have also shown academic stress to positively affect school burnout (Backović et al., 2012; Jung et al., 2015; Jiang et al., 2021). Consequently, this study's finding here is consistent with previous findings. In this regard, the way academic stress compels students at school triggers school burnout. A student who experiences academic stress may also experience school burnout because effectively using coping mechanisms to solve problems at school becomes difficult. In addition, the way academic stress makes using resources such as effective time management and planned work difficult for students is also able to result in school burnout. This study has concluded academic stress to increase the frequency with which students experience school burnout. Additionally, the current study has found academic stress to be a positive predictor of depression as well as school burnout. Previous studies in the literature have also reached the same conclusion (Ang & Huan, 2006a; Eremsoy et al., 2005; Jayanthi et al., 2015; Lee & Kim, 2016). In light of both the findings from this study and those of previous studies, one can also argue academic stress to wears down individuals mentally and resultantly trigger depression in adolescents. In addition, one way individuals psychologically react to stressful situations at school noteworthily involves experiencing depression (Prabu, 2015). Because students who experience academic stress also experience negative emotions more intensely, reactions involving such feelings as depression become possible. The results from this study also reveal this.

The main purpose of the current study has been to examine the relationships among academic stress, school burnout, depression, and quality of sleep using a holistic model. The mediation model discussed in the study has been validated with regard to Turkish adolescents. The study has found school burnout and depression to have a mediating role in the relationship between academic stress and sleep quality, with academic stress having a direct effect on sleep quality, as well as an indirect effect through school burnout and depression. In other words, academic stress triggers school burnout and depression, and school burnout and depression negatively affect sleep quality. Studies in the literature have stated academic stress to cause both physical and mental reactions in individuals (Caldwell et al., 2010; Prabu, 2015). In this context, the academic stress adolescents experience has a role that increases their school burnout and depression levels. Moreover, studies in the literature have stated various problems such as school burnout (May et al., 2020; Liu et al., 2021) and depression (Becker et al., 2017; Wang et al., 2020) to result in negative physical as well as mental consequences for individuals. In this context, the academic stress an individual experiences increases school burnout and depression. In addition, sleep processes are adversely affected due to academic stress. The results of the model the present study has tested and verified can also be said to reveal this situation. One finding that directly supports this was made by Yan et al. (2018) over Chinese adolescents.

The present study constructed its model in regard to adolescents' quality of sleep and also confirmed the model for adolescents in Turkish culture. Studies in the literature have shown the variables in the current study to have generally been handled in pairs rather than holistically or in detail. This study has holistically handled the relationship networks among the variables of academic stress, school burnout, depression, and quality of sleep, thus revealing the direct and indirect effects between these variables. In addition, the study tested the model, which had only previously been tested on adolescents in Chinese culture, on adolescent high school students in Turkish culture, thus making a contribution to the existing literature in terms of the model's generalizability.

Conclusion

This study aimed to test a model on the sleep quality of Turkish adolescents and concluded the tested model to be confirmed with regard to Turkish culture. The study also confirmed the mediating role of school burnout and depression in the relationship between academic stress and sleep quality. As a result of the model, academic stress has been concluded to have a direct effect on school burnout, depression, and quality of sleep; school burnout to have a direct effect on depression and quality of sleep; and depression to have a direct effect on quality of sleep. Academic stress has also been concluded to have an indirect effect on quality of sleep through the variables of school burnout and depression.

The study's results show academic stress in adolescents to lead to negative results in multiple ways. When considering school burnout to be a common condition in adolescents (Tang, Upadyaya, & Salmela-Aro, 2021; Walburg, 2014) and depression to be a frequent occurrence in adolescence (Wegner et al., 2020), practitioners and researchers can be said to have an important role in reducing the possible negative effects of academic stress. Preventive studies in particular are thought to be important in this regard. In addition, when considering that academic stress negatively affects sleep quality, which is an important physical and mental need in adolescence (Şenol et al., 2012), one can argue preventive and remedial studies to also be important in this regard. From this point of view, this study can suggest that psychological counsellors, educators, and mental health professionals in the field should focus on studies aimed at reducing the negative consequences of academic stress, depression, and school burnout among adolescents and on increasing students' effective coping mechanisms regarding these problems, with the idea being that students' sleep processes will become healthier as a result of experiencing these negative situations less.

Limitations and Recommendations

In addition to the study's important and original findings, it also has had some limitations, the first being that the study was conducted only on adolescents attending high school. Future studies can increase the sample size, age range, and participant diversity by including adolescents in middle school. The second limitation of the current study is that the study collected its data using only self-report scales. This limitation can be reduced in future studies by conducting the research in accordance with the explanatory design procedures as mixed-methods studies. In line with this, data can be collected using techniques such as interviews and observations with regard to the qualitative dimension of the research. Another limitation of this study is that it had not been conducted with adolescent individuals who'd received any clinical diagnosis regarding sleep disorders and depression but only with normal adolescents with no clinical diagnoses. This limitation can be reduced by having future studies include individuals with clinical diagnoses and examining whether the model is valid for them as well. Another limitation of the study is that it examined the effect of individual-based factors on sleep quality. Future studies can add environmental factors such as school and family and examine the effects of environmental factors on adolescents' quality of sleep within the scope of a model. In addition, the current study is a cross-sectional study whose data were collected in one go. Future studies can longitudinally examine the effects of academic stress, school burnout, and depression on adolescents' quality of sleep. This study's model was tested in regard to sleep quality for Turkish adolescents and had been previously tested on Chinese adolescents. Future studies can further increase the generalizability of the model by testing it on adolescents from other cultures. Another limitation of the current study is that the current version of the model was tested in Turkish culture without including any other variables that had been used in the model tested on Chinese adolescents. Future studies can reduce this limitation by including other variables in the model.

References

Ahrberg, K., Dresler, M., Niedermaier, S., Steiger, A., & Genzel, L. (2012). The interaction between sleep quality and academic performance. *Journal of Psychiatric Research*, *46*(12), 1618-1622. doi:10.1016/j.jpsychires.2012.09.008

Alfano, C. A., Zakem, A. H., Costa, N. M., Taylor, L. K., & Weems, C. F. (2009). Sleep problems and their relation to cognitive factors, anxiety, and depressive symptoms in children and adolescents. *Depression and Anxiety*, *26*(6), 503-512. doi:10.1002/da.20443

Almojali, A. I., Almalki, S. A., Alothman, A. S., Masuadi, E. M., & Alaqeel, M. K. (2017). The prevalence and association of stress with sleep quality among medical students. *Journal of Epidemiology and Global Health*, *7*(3), 169-174. doi:10.1016/j.jegh.2017.04.005

Anderson, S. L. (2000). *The effects of a rational emotive behavior therapy intervention on irrational beliefs and burnout among middle school teachers in the State of Iowa* (Doctoral dissertation). University of Northern Iowa, Iowa.

Ang, R. P., & Huan, V. S. (2006a). Relationship between academic stress and suicidal ideation: Testing for depression as a mediator using multiple regression. *Child Psychiatry and Human Development*, *37*(2), 133-143. doi:10.1007/s10578-006-0023-8

Ang, R. P., & Huan, V. S. (2006b). Academic expectations stress inventory: Development, factor analysis, reliability, and validity. *Educational and Psychological Measurement*, *66*(3), 522-539. doi:10.1177/0013164405282461

Arbabisarjou, A., Mehdi, H. S., Sharif, M. R., Alizadeh, K. H., Yarmohammadzadeh, P., & Feyzollahi, Z. (2016). The relationship between sleep quality and social intimacy, and academic burnout in students of medical sciences. *Global Journal of Health Science*, *8*(5), 231-238. doi:10.5539/gjhs.v8n5p231

Aypay, A. (2011). İlköğretim II. kademe öğrencileri için okul tükenmişliği ölçeği: Geçerlik ve güvenirlik çalışması. *Kuram ve Uygulamada Eğitim Bilimleri*, *11*(2), 511-527.

Aypay, A. (2017). A positive model for reducing and preventing school burnout in high school students. *Educational Sciences: Theory & Practice*, *17*(4), 1345-1359. doi:10.12738/estp.2017.4.0173

Aysan, E., Karaköse, S., Zaybak, A., & İsmailoğlu, E. G. (2014). Üniversite öğrencilerinde uyku kalitesi ve etkileyen faktörler. *Dokuz Eylül Üniversitesi Hemşirelik Fakültesi Elektronik Dergisi*, *7*(3), 193-198. Retrieved from https://dergipark.org.tr/tr/download/article-file/753356

Backović, D. V., Ilić Živojinović, J., Maksimović, J., & Maksimović, M. (2012). Gender differences in academic stress and burnout among medical students in final years of education. *Psychiatria Danubina*, *24*(2), 175-181. Retrieved from https://pubmed.ncbi.nlm.nih.gov/22706416/

Bae, E. S., Kang, H. S., & Lee, H. N. (2020). The mediating effect of sleep quality in the relationship between academic stress and social network service addiction tendency among adolescents. *Journal of Korean Academy of Community Health Nursing*, *31*(3), 290-299. doi:10.12799/jkachn.2020.31.3.290

Balcı-Çelik, S., & Uysal-Atabay, E. (2019). Kutcher ergen depresyonu ölçeği (KEDÖ-11) Türkçe uyarlaması: Geçerlik ve güvenirlik çalışması. *Social Sciences Studies Journal*, *5*(30), 607-616. doi:10.26449/sssj.1258

Bayram, N. (2010). *Yapısal eşitlik modellemesine giriş AMOS uygulamaları*. Bursa: Ezgi Kitabevi.

Becker, N. B., Jesus, S. N., Joao, K. A., Viseu, J. N., & Martins, R. I. (2017). Depression and sleep quality in older adults: A meta-analysis. *Psychology, Health & Medicine*, *22*(8), 889-895. doi:10.1080/13548506.2016.1274042

Bedewy, D., & Gabriel, A. (2015). Examining perceptions of academic stress and its sources among university students: The perception of academic stress scale. *Health Psychology Open*, *2*(2), 1-9. doi:10.1177/2055102915596714

Benavente, S. B. T., Silva, R. M. D., Higashi, A. B., Guido, L. D. A., & Costa, A. L. S. (2014). Influence of stress factors and socio-demographic characteristics on the sleep quality of nursing students. *Revista da Escola de Enfermagem da USP*, *48*(3), 514-520. doi:0.1590/S0080-623420140000300018

Borji, M., Otaghi, M., Salimi, E., & Sanei, P. (2017). Investigating the effect of performing the quiet time protocol on the sleep quality of cardiac patients. *Biomedical Research*, *28*(16), 7076-7080.

Brooks, S. (2004). The Kutcher adolescent depression scale (KADS). *Child and Adolescent Psychopharmacology News*, *9*(5), 4-6. Retrieved from https://guilfordjournals.com/doi/pdf/10.1521/capn.9.5.4.52044

Brooks, S. J., Krulewicz, S. P., & Kutcher, S. (2003). The Kutcher Adolescent Depression Scale: assessment of its evaluative properties over the course of an 8-week pediatric pharmacotherapy trial. *Journal of Child and Adolescent Psychopharmacology*, *13*(3), 337-349. doi:10.1089/104454603322572679

Buzek, T., Poulain, T., Vogel, M., Engel, C., Bussler, S., Körner, A., ... Kiess, W. (2019). Relations between sleep duration with overweight and academic stress-just a matter of the socioeconomic status?. *Sleep Health*, *5*(2), 208-215. doi:10.1016/j.sleh.2018.12.004

Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, E., Karadeniz, Ş., & Demirel, F. (2012). *Bilimsel araştırma yöntemleri*. Ankara: Pegem Akademi Yayıncılık.

Caldwell, K., Harrison, M., Adams, M., Quin, R. H., & Greeson, J. (2010). Developing mindfulness in college students through movement-based courses: Effects on self-regulatory self-efficacy, mood, stress, and sleep quality. *Journal of American College Health*, *58*(5), 433-442. doi:10.1080/07448480903540481

Collin, V., O'Selmo, E., & Whitehead, P. (2020). Stress, psychological distress, burnout and perfectionism in UK dental students. *British Dental Journal*, *229*(9), 605-614. doi:10.1038/s41415-020-2281-4

Deng, J., Zhang, L., Cao, G., & Yin, H. (2021). Effects of adolescent academic stress on sleep quality: Mediating effect of negative affect and moderating role of peer relationships. *Current Psychology*, 1-10. doi:10.1007/s12144-021-01803-7

Eremsoy, C. E., Çelimli, Ş., & Gençöz, T. (2005). Students under academic stress in a Turkish University: Variables associated with symptoms of depression and anxiety. *Current Psychology*, *24*(2), 123-133. Retrieved from https://link.springer.com/content/pdf/10.1007/s12144-005-1011-z.pdf

Evers, K., Chen, S., Rothmann, S., Dhir, A., & Pallesen, S. (2020). Investigating the relation among disturbed sleep due to social media use, school burnout, and academic performance. *Journal of Adolescence*, *84*, 156-164. doi:10.1016/j.adolescence.2020.08.011

Fiorilli, C., De Stasio, S., Di Chiacchio, C., Pepe, A., & Salmela-Aro, K. (2017). School burnout, depressive symptoms and engagement: Their combined effect on student achievement. *International Journal of Educational Research*, *84*, 1-12. doi:10.1016/j.ijer.2017.04.001

Gaina, A., Sekine, M., Hamanishi, S., Chen, X., Wang, H., Yamagami, T., & Kagamimori, S. (2007). Daytime sleepiness and associated factors in Japanese school children. *The Journal of Pediatrics*, *151*(5), 518-522. doi:10.1016/j.jpeds.2007.04.036

Gregory, A. M., & Sadeh, A. (2012). Sleep, emotional and behavioral difficulties in children and adolescents. *Sleep Medicine Reviews*, *16*(2), 129-136. doi:10.1016/j.smrv.2011.03.007

Haun, V. C., & Oppenauer, V. (2019). The role of job demands and negative work reflection in employees' trajectory of sleep quality over the workweek. *Journal of Occupational Health Psychology*, *24*(6), 675.

Hoefelmann, L. P., da Silva Lopes, A., da Silva, K. S., Moritz, P., & Nahas, M. V. (2013). Sociodemographic factors associated with sleep quality and sleep duration in adolescents from Santa Catarina, Brazil: What changed between 2001 and 2011?. *Sleep Medicine*, *14*(10), 1017-1023. doi:10.1016/j.sleep.2013.05.015

Hox, J. J., & Bechger, T. M. (1998). An introduction to structural equation modeling. *Family Science Review, 11*, 354-373.

Jacoby, A., Snape, D., Lane, S., & Baker, G. A. (2015). Self-reported anxiety and sleep problems in people with epilepsy and their association with quality of life. *Epilepsy & Behavior*, *43*, 149-158. doi:10.1016/j.yebeh.2014.09.071

Jayanthi, P., Thirunavukarasu, M., & Rajkumar, R. (2015). Academic stress and depression among adolescents: A cross-sectional study. *Indian Pediatrics*, *52*(3), 217-219. Retrieved from https://link.springer.com/content/pdf/10.1007/s13312-015-0609-y.pdf

Jiang, S., Ren, Q., Jiang, C., & Wang, L. (2021). Academic stress and depression of Chinese adolescents in junior high schools: Moderated mediation model of school burnout and self-esteem. *Journal of Affective Disorders*, *295*, 384-389. doi:10.1016/j.jad.2021.08.085

Jung, I., Kim, J. H., Ma, Y., & Seo, C. (2015). Mediating effect of academic self-efficacy on the relationship between academic stress and academic burnout in Chinese adolescents. *International Journal of Human Ecology*, *16*(2), 63-77. Retrieved from https://www.koreascience.or.kr/article/JAKO201504641502042.page

Kaltiala-Heino, R., Marttunen, M., Rantanen, P., & Rimpelä, M. (2003). Early puberty is associated with mental health problems in middle adolescence. *Social Science & Medicine*, *57*(6), 1055-1064. doi:10.1016/S0277-9536(02)00480-X

Kansagra, S. (2020). Sleep disorders in adolescents. *Pediatrics*, *145*(Suppl2), 204-209. doi:10.1542/peds.2019-2056I

Karadağ, M. (2020). Okulu bırakan ergenlerde depresyon ve anksiyete düzeylerinin değerlendirilmesi. *Klinik Psikiyatri Dergisi*, *23*(3), 274-279. doi:10.5505/kpd.2020.72324

Kelecioğlu, H., & Bilge, F. (2009). Akademik beklentilere ilişkin stres envanterinin uyarlanması: Geçerlik ve güvenirlik çalışması. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, *2009*(36), 148-157. Retrieved from https://dergipark.org.tr/tr/download/article-file/87498

Kline, R. B. (2015). *Principles and practice of structural equation modeling*. New York: Guilford Press.

Krystal, A. D., & Edinger, J. D. (2008). Measuring sleep quality. *Sleep Medicine*, *9*, 10-17. doi:10.1016/S1389-9457(08)70011-X

Kumaraswamy, N. (2013). Academic stress, anxiety and depression among college students: A brief review. *International Review of Social Sciences and Humanities*, *5*(1), 135-143. Retrieved from www.irssh.com

Lang, C., Brand, S., Feldmeth, A. K., Holsboer-Trachsler, E., Pühse, U., & Gerber, M. (2013). Increased self-reported and objectively assessed physical activity predict sleep quality among adolescents. *Physiology & Behavior*, *120*, 46-53. doi:10.1016/j.physbeh.2013.07.001

LeBlanc, J. C., Almudevar, A., Brooks, S. J., & Kutcher, S. (2002). Screening for adolescent depression: Comparison of the Kutcher Adolescent Depression Scale with the Beck Depression Inventory. *Journal of Child and Adolescent Psychopharmacology*, *12*(2), 113-126. doi:10.1089/104454602760219153PDF/EPUB

Lee, H. S., & Kim, C. (2016). Structural equation modeling to assess discrimination, stress, social support, and depression among the elderly women in South Korea. *Asian Nursing Research*, *10*(3), 182-188. doi:10.1016/j.anr.2016.06.003

Lehto, J. E., Kortesoja, L., & Partonen, T. (2019). School burnout and sleep in Finnish secondary school students. *Sleep Science*, *12*(1), 10-14. doi:10.5935/1984-0063.20190051

Liang, M., Guo, L., Huo, J., & Zhou, G. (2021). Prevalence of sleep disturbances in Chinese adolescents: A systematic review and meta-analysis. *Plos one*, *16*(3), e0247333. doi:10.1371/journal.pone.0247333

Liu, Q. Q., Zhou, Z. K., Yang, X. J., Kong, F. C., Sun, X. J., & Fan, C. Y. (2018). Mindfulness and sleep quality in adolescents: Analysis of rumination as a mediator and self-control as a moderator. *Personality and Individual Differences*, *122*, 171-176. doi:10.1016/j.paid.2017.10.031

Liu, X., Zhang, L., Wu, G., Yang, R., & Liang, Y. (2021). The longitudinal relationship between sleep problems and school burnout in adolescents: A cross-lagged panel analysis. *Journal of Adolescence*, *88*, 14-24. doi:10.1016/j.adolescence.2021.02.001

May, R. W., Bauer, K. N., & Fincham, F. D. (2015). School burnout: Diminished academic and cognitive performance. *Learning and Individual Differences*, *42*, 126-131. doi:10.1016/j.lindif.2015.07.015

May, R. W., Bauer, K. N., Seibert, G. S., Jaurequi, M. E., & Fincham, F. D. (2020). School burnout is related to sleep quality and perseverative cognition regulation at bedtime in young adults. *Learning and Individual Differences*, *78*, 101821. doi:10.1016/j.lindif.2020.101821

Meijer, A. M., & van den Wittenboer, G. L. (2004). The joint contribution of sleep, intelligence and motivation to school performance. *Personality and Individual Differences*, *37*(1), 95-106. doi:10.1016/j.paid.2003.08.002

Michie, F., Glachan, M., & Bray, D. (2001). An evaluation of factors influencing the academic self-concept, self-esteem and academic stress for direct and re-entry students in higher education. *Educational Psychology*, *21*(4), 455-472. doi:10.1080/01443410120090830

Misra, R., & McKean, M. (2000). College students' academic stress and its relation to their anxiety, time management, and leisure satisfaction. *American Journal of Health Studies*, *16*(1), 41-51.

Oginska, H., & Pokorski, J. (2006). Fatigue and mood correlates of sleep length in three age-social groups: School children, students, and employees. *Chronobiology International*, *23*(6), 1317-1328. doi:10.1080/07420520601089349

Önder, İ., Masal, E., Demirhan, E., Horzum, M. B., & Beşoluk, Ş. (2016). Psychometric properties of sleep quality scale and sleep variables questionnaire in Turkish student sample. *International Journal of Psychology and Educational Studies*, *3*(3), 9-21. doi:10.17220/ijpes.2016.03.002

Pallant, J. (2013). *SPSS survival manual*. New York: McGraw-Hill.

Pensuksan, W. C., Lertmaharit, S., Lohsoonthorn, V., Rattananupong, T., Sonkprasert, T., Gelaye, B., & Williams, M. A. (2016). Relationship between poor sleep quality and psychological problems among undergraduate students in the Southern Thailand. *Walailak Journal of Science and Technology*, *13*(4), 235-242. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4853815/

Prabu, P. S. (2015). A study on academic stress among higher secondary students. *International Journal of Humanities and Social Science Invention*, *4*(10), 63-68.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*(3), 879-891. doi:10.3758/BRM.40.3.879

Przepiorka, A., & Blachnio, A. (2020). The role of Facebook intrusion, depression, and future time perspective in sleep problems among adolescents. *Journal of Research on Adolescence*, *30*(2), 559-569. doi:10.1111/jora.12543

Riemann, D., Krone, L. B., Wulff, K., & Nissen, C. (2020). Sleep, insomnia, and depression. *Neuropsychopharmacology*, *45*(1), 74-89. doi:10.1038/s41386-019-0411-y

Roeser, K., Eichholz, R., Schwerdtle, B., Schlarb, A. A., & Kübler, A. (2012). Relationship of sleep quality and health-related quality of life in adolescents according to self-and proxy ratings: A questionnaire survey. *Frontiers in Psychiatry*, *3*, 76. doi:10.3389/fpsyt.2012.00076

Salmela-Aro, K., & Tynkkynen, L. (2012). Gendered pathways in school burnout among adolescents. *Journal of Adolescence*, *35*(4), 929-939. doi:10.1016/j.adolescence.2012.01.001

Salmela-Aro, K., Kiuru, N., Leskinen, E., & Nurmi, J. (2009). School Burnout Inventory (SBI): Reliability and validity. *European Journal of Psychological Assessment, 25*, 48-57. doi:10.1027/1015-5759.25.1.48

Salmela-Aro, K., Kiuru, N., Pietikäinen, M., & Jokela, J. (2008). Does school matter? The role of school context in adolescents' school-related burnout. *European Psychologist*, *13*(1), 12-23. doi:10.1027/1016-9040.13.1.12

Salmela-Aro, K., Upadyaya, K., Hakkarainen, K., Lonka, K., & Alho, K. (2017). The dark side of internet use: Two longitudinal studies of excessive internet use, depressive symptoms, school burnout and engagement among Finnish early and late adolescents. *Journal of Youth and Adolescence*, *46*(2), 343-357. doi:10.1007/s10964-016-0494-2

Santrock, L. (2012). *Ergenlik* (D. M. Siyez, Trans.). Ankara: Nobel Yayıncılık.

Seçer, İ. (2015). Üniversite öğrencilerinde okul tükenmişliği ile psikolojik uyumsuzluk arasındaki ilişkinin incelenmesi. *Atatürk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, *19*(1), 81-99. Retrieved from https://dergipark.org.tr/tr/pub/ataunisosbil/issue/2838/38747

Seçer, İ., Halmatov, S., Veyis, F., & Ateş, B. (2013). Okul tükenmişlik ölçeğinin Türkçe'ye uyarlanması: Güvenirlik ve geçerlik çalışması. *Turkish Journal of Education, 2*(2), 16-27. Retrieved from https://dergipark.org.tr/tr/pub/turje/issue/17340/181057

Seun-Fadipe, C. T., & Mosaku, K. S. (2017). Sleep quality and psychological distress among undergraduate students of a Nigerian university. *Sleep Health*, *3*(3), 190-194. doi:10.1016/j.sleh.2017.02.004

Shim, J., & Kang, S. W. (2017). Behavioral factors related to sleep quality and duration in adults. *Journal of Lifestyle Medicine*, *7*(1), 18-26. doi:10.15280/jlm.2017.7.1.18

Sivertsen, B., Harvey, A. G., Lundervold, A. J., & Hysing, M. (2014). Sleep problems and depression in adolescence: Results from a large population-based study of Norwegian adolescents aged 16-18 years. *European Child & Adolescent Psychiatry*, *23*(8), 681-689. doi:10.1007/s00787-013-0502-y

Smith, K. J., & Emerson, D. J. (2021). Resilience, psychological distress, and academic burnout among accounting students. *Accounting Perspectives*, *20*(2), 227-254. doi:10.1111/1911-3838.12254

Stoliker, B. E., & Lafreniere, K. D. (2015). The influence of perceived stress, loneliness, and learning burnout on university students' educational experience. *College Student Journal*, *49*(1), 146-160.

Şenol, V., Soyuer, F., Akça, R. P., & Argün, M. (2012). Adolesanlarda uyku kalitesi ve etkileyen faktörler. *Kocatepe Tıp Dergisi*, *13*(2), 93-104. Retrieved from https://dergipark.org.tr/tr/download/article-file/161309

Şimşek, Y., & Tekgül, N. (2019). Sleep quality in adolescents in relation to age and sleep-related habitual and environmental factors. *Adolescence*, *6*(4), 307-313. doi:10.4274/jpr.galenos.2019.86619

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics.* Boston, MA: Allyn & Bacon.

Tang, X., Upadyaya, K., & Salmela-Aro, K. (2021). School burnout and psychosocial problems among adolescents: Grit as a resilience factor. *Journal of Adolescence*, *86*, 77-89. doi:10.1016/j.adolescence.2020.12.002

Thompson, G., McBride, R. B., Hosford, C. C., & Halaas, G. (2016). Resilience among medical students: The role of coping style and social support. *Teaching and Learning in Medicine*, *28*(2), 174-182. doi:10.1080/10401334.2016.1146611

Tuncay, B., & Göger, B. (2022). Ergenlerde dijital oyun bağımlılığı ve uyku kalitesi arasındaki ilişkinin incelenmesi. *Journal of Turkish Sleep Medicine*, *9*, 79-84. doi:10.4274/jtsm.galenos.2021.52207

Veyis, F., Seçer, İ., & Ulas, S. (2019). An investigation of the mediator role of school burnout between academic stress and academic motivation. *Journal of Curriculum and Teaching*, *8*(4), 46-53. doi:10.5430/jct.v8n4p46

Walburg, V. (2014). Burnout among high school students: A literature review. *Children and Youth Services Review*, *42*, 28-33. doi:10.1016/j.childyouth.2014.03.020

Wang, Y., Xiao, H., Zhang, X., & Wang, L. (2020). The role of active coping in the relationship between learning burnout and sleep quality among college students in China. *Frontiers in Psychology*, *11*, 647. doi:10.3389/fpsyg.2020.00647

Wegner, M., Amatriain-Fernández, S., Kaulitzky, A., Murillo-Rodriguez, E., Machado, S., & Budde, H. (2020). Systematic review of meta-analyses: Exercise effects on depression in children and adolescents. *Frontiers in Psychiatry*, *11*, 81-93. doi:10.3389/fpsyt.2020.00081

Woods, H. C., & Scott, H. (2016). Sleepyteens: Social media use in adolescence is associated with poor sleep quality, anxiety, depression and low self-esteem. *Journal of Adolescence*, *51*, 41-49. doi:10.1016/j.adolescence.2016.05.008

Wunsch, K., Kasten, N., & Fuchs, R. (2017). The effect of physical activity on sleep quality, well-being, and affect in academic stress periods. *Nature and Science of Sleep*, *26*(9), 117-126. doi:10.2147/NSS.S132078

Yan, Y. W., Lin, R. M., Su, Y. K., & Liu, M. Y. (2018). The relationship between adolescent academic stress and sleep quality: A multiple mediation model. *Social Behavior and Personality: An International Journal*, *46*(1), 63-77. doi:10.2224/sbp.6530

Yusoff, M. S. B., Hadie, S. N. H., & Yasin, M. A. M. (2021). The roles of emotional intelligence, neuroticism, and academic stress on the relationship between psychological distress and burnout in medical students. *BMC Medical Education*, *21*(1), 1-10. doi:10.1186/s12909-021-02733-5

Zhang, W. J., Yan, C., Shum, D., & Deng, C. P. (2020). Responses to academic stress mediate the association between sleep difficulties and depressive/anxiety symptoms in Chinese adolescents. *Journal of Affective Disorders*, *263*, 89-98. doi:10.1016/j.jad.2019.11.157