IJPES
www.ijpes.com
International Journal of Psychology and Educational Studies
ISSN: 2148-9378

Predictiveness of Covid-19 Anxiety and Emotion Regulation on Sleep Quality: The Moderator Effect of Gender

İsmail YELPAZE[1]

[1]*Kahramanmaraş Sütçü İmam University, Faculty of Education, Kahramanmaraş, Turkey* *0000-0003-4428-0502*

ARTICLE INFO

Article History
Received Click
Received in revised form Click
Accepted Click

Article Type: Research Article

ABSTRACT

Prior research indicates that anxiety and emotion regulation are related to sleep quality. This study extends the body of research by investigating how people in different gender groups are affected by the coronavirus disease 2019 (Covid-19) anxiety and emotion regulation in terms of sleep quality. The present study examined gender as a potential moderating variable on the associations of Covid-19 anxiety and emotion regulation with sleep quality. University students were recruited via e-mail to participate in a brief online survey. Data were collected using the Pittsburgh Sleep Quality Index, Fear of COVID-19, and Emotion Management Skills Scale. The current study used SPSS PROCESS, an SPSS macro developed by Hayes. Results indicated that Covid-19 anxiety was related to poor sleep quality and emotion regulation was related to good sleep quality. Gender was a significant moderator for the relationship between Covid-19 anxiety and sleep quality, but not emotion regulation and sleep quality. The female gender presented a positive association between Covid-19 anxiety and poor sleep quality in comparison to the male gender. The relationship between emotion regulation and good sleep quality was found to be significant and positive for both genders. In the pandemic, Covid-19 anxiety should be reduced and people should have skills to manage their emotions. Otherwise, they will experience serious sleep problems.

Keywords:
Sleep quality, Covid-19 anxiety, emotion regulation.

1. Introduction

Coronavirus disease 2019 (Covid-19) is an acute respiratory illness (Paules et al., 2020), which has been plaguing the world since December 2019. As of July 14, 2020, a total of 12,964,809 Covid-19 cases have been confirmed with 570,288 deaths; Covid-19 cases were reported in 216 countries (WHO, 2020a). Thus, WHO declared the Covid-19 as a Public Health Emergency of International Concern and as a pandemic (WHO, 2020b).

There is still no effective treatment available against this virus, which causes serious respiratory diseases and even death (Majedi & Majedi, 2020). For this reason, the most important struggle with the virus is trying to prevent it from spreading. Since the most common way of transmission is being in close contact with other people, many countries have developed policies to prevent large gatherings of people. However, these policies have started to adversely affect mental health. As a matter of fact, it has been observed that people adopt unhealthy behaviors as a means of preventing the disease. For example, in Turkey, a man (aged 45) drank ethyl alcohol and disinfectant in order to protect himself against the new type of coronavirus, but he later died in the hospital (NTV, 2020). In France, a doctor committed suicide after their coronavirus test came back positive (Haberturk, 2020). Many serious cases like these and studies show that people are experiencing severe Covid-19 anxiety (Bigalke et al., 2020). Anxiety disorders are the most common class of mental disorders (Kessler et al., 2005). Several studies show that mental health problems occurred during the severe

[1]Corresponding author: Kahramanmaraş Sütçü İmam University, Faculty of Education, Kahramanmaraş, Turkey.
e-mail: ismailyelpaze@gmail.com
Citation: Yelpaze, İ. (2021). Predictiveness of Covid-19 anxiety and emotion regulation on sleep quality: The moderator effect of gender. *International Journal of Psychology and Educational Studies, 8*(Special Issue), 45-56. https://dx.doi.org/10.52380/ijpes.2021.8.4.586

acute respiratory syndrome epidemic (McAlonan et al., 2007) and the Middle East respiratory syndrome (Lee et al., 2018) as well. Post-epidemic studies investigated that average citizens also had psychological symptoms such as anxiety, depression, shame, stigma, and grief (International Medical Corps [IMC], 2014; Kamara et al., 2017). Based on the above research evidence and news, we speculate that the psychological condition of the public may also be affected during the Covid-19 outbreak.

It is inevitable that Covid-19 anxiety would cause many negative situations in individuals' lives. It is already clear that there are many physical, psychological, and behavioral problems related to anxiety (Rajeswari & SanjeevaReddy, 2020). Anxiety is one of the most common psychological disorders and creates a great burden both on the affected ones and the society (Mann et al., 2012). One of these problems is sleep disturbance. Indeed 60%–70% of patients with anxiety complain of initiating and maintaining sleep (Sutton, 2014). According to a meta-analysis study involving 177 studies, psychiatric patients with anxiety disorders experience significantly reduced total sleep time, sleep efficiency, and prolonged sleep delay (Kyle et al., 2014). Since the positive association between anxiety and poor sleep quality is clear (Adams & Kisler, 2013), we have reasons to speculate that Covid-19 anxiety is positively related to sleep disorders.

H1. Covid-19 anxiety is a positive predictor of poor sleep quality.

The quality of sleep can be affected not only by anxiety but by all negative emotions in general. However, the sleep of those who can functionally manage these negative emotions may not be affected much by this situation (O'Leary et al., 2017). Emotion regulation is a process that enables us to adjust the intensity, timing, and way of experiencing emotions and expressing them (Gross, 1998). People cannot control stress factors at all times, but effective emotion regulation strategies help control stress's impact on sleep. Racine et al. (2013) found that women who sleep less or more than an average of 6–8 hours of sleep duration have reduced emotion regulation capacity. Tavernier and Willoughby (2015) found that emotional regulation is associated with sleep problems in a longitudinal study of university students. Briefly, the relationship between emotion regulation and sleep quality has been shown in both adults (Mauss et al., 2013), adolescents (Baum et al., 2014), and children 7–17 years old (Vriend et al., 2013).

H2. Emotion regulation is a negative predictor of poor sleep quality.

It is stated in studies that both anxiety and the ability to manage emotions differ in terms of gender. Although women are generally more successful in managing emotions, it is stated that the difference varies according to the subject (Goubet & Chrysikou, 2019). On the contrary, there is also a study showing that women fail to use appropriate strategies for emotion regulation (Lafrance et al., 2014). In addition, it has been observed that men use the suppression method whereas women use the reappraisal method more intensely for emotion regulation (Spaapen et al., 2014). Consequently, considering the research results, managing emotions differs according to gender.

It is noteworthy that there is a difference in anxiety in terms of gender as in emotion regulation. Females are more vulnerable to stress and pain than males, so they might experience greater sadness and anxiety (Chaplin et al., 2008). Prevalence rates of anxiety were higher in women than men for each anxiety disorder, including panic disorder, generalized anxiety disorder, and post-traumatic stress disorder (PTSD) (McLean et al., 2011). University students—especially female students—significantly suffered more from stress and anxiety (Bayram & Bilgel, 2008; Mahmoud et al., 2012). Moreover, some researchers observed a higher prevalence rate of depression among female students (Liu et al., 2019; Tung et al., 2018). However, other researchers insisted that male students were more likely to experience depressive disorders than female students (Al-Qaisy, 2011). Since female and male students are affected by anxiety in different ways, we can speculate that the relationship between Covid-19 anxiety and sleep quality is moderated by gender.

H3. The relationship of Covid-19 anxiety and emotion regulation with sleep quality is moderated by gender.

Figure 1 depicts the full research model of the relationship between Covid-19 anxiety and emotion regulation and sleep quality moderated by gender, respectively.

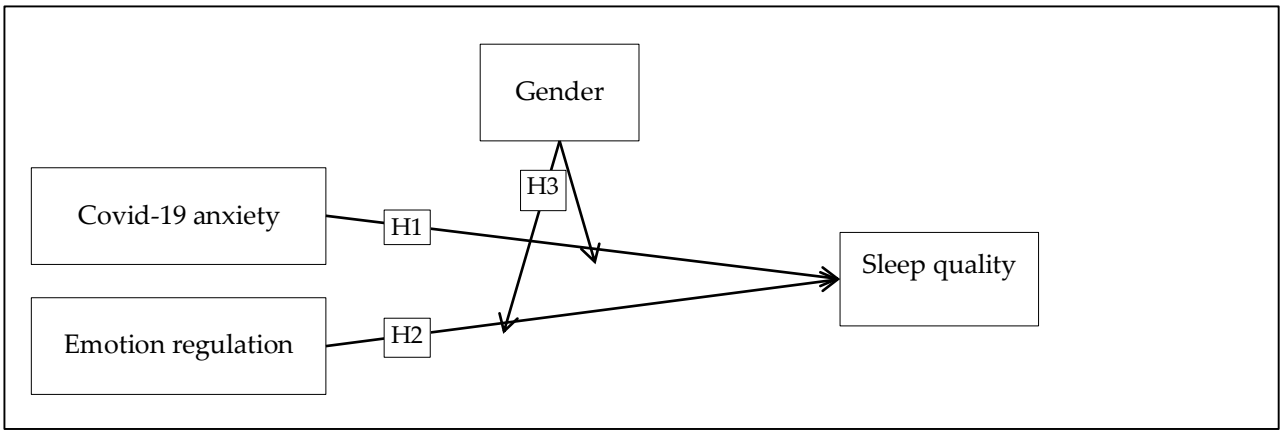

Figure 1. *Research Model of the Relationship between Variables*

1.1. Importance of the Study

When the literature was examined for the purpose of this study, it was observed that there are studies showing the relationship of sleep problems with emotion regulation (Pickett et al., 2016) and anxiety (Dixon et al., 2018). There are also studies showing that emotion management skills (Masumoto et al., 2016) and anxiety levels (Gregory et al., 2011) differ according to gender. However, we could not find any study showing how the relationship of sleep problems with Covid-19 anxiety and emotion management differs in terms of gender. This study is expected to provide an explanation for this gap in the literature. Based on these data, the priorities for helping women and men who have Covid-19 anxiety and insufficient ability to manage emotions will be determined. As a result, the findings of this study are expected to offer new ideas for both researchers and practitioners.

2. Methodology

2.1. Research Model

The purpose of this study is to analyze the predictive role of Covid-19 and emotion regulation on sleep quality and the moderator role of gender in this relationship. This study was designed according to predictive correlational design, which is a quantitative method. The purpose of a predictive correlational design is to identify variables that will predict an outcome. In this form of research, the investigator identifies one or more predictor variables and a criterion (outcome) variable (Creswell, 2012).

2.2. Research Sample

One hundred and forty-two university students, who are studying at seven different undergraduate degree programs, completed the survey. Among them, 81% (N = 116) were female. Participants were asked about their biological sex; however, biological sex and gender roles overlap to a large extent in Turkey. Participants' mean age is 20.77 (SD = 2.44). All participants—except two—lived with their families during the pandemic lockdown process. The convenience sampling method was used in the selection of research participants, the convenience sampling method was used in the selection of research participants, which often helps in selecting participants who are readily and easily available. Convenience sampling tends to be a favored sampling technique as it is inexpensive and an easy option compared to other sampling techniques (Taherdoost, 2016). The prepared online form was sent to the volunteer academicians, who also shared the link to the online research form with the student groups who attended their classes.

2.3. Data Collection Tools

2.3.1. Sleep Quality: The Turkish version of the Pittsburgh Sleep Quality Index (PSQI - PUKI in Turkish) scale was used to assess the subject's sleep quality over the last month (Ağargün, Kara & Anlar, 1996). The clinical and clinimetric features of PSQI were evaluated over a 12-month period with healthy, depressed, and sleep-disordered patients. The clinical and clinimetric properties of PSQI indicate that it can be used both in clinical practice and in psychiatric research. The PSQI scale contains seven components (subjective sleep quality, sleep duration, sleep latency, habitual sleep efficiency, use of sleep medications, sleep disturbance, and daytime dysfunction), and the score for each component ranges from 0 to 3 points. The

global PSQI score ranges from 0 to 21, with higher scores indicating more severe sleep disorder (Buysse et al., 1989). The Turkish version of PSQI has been demonstrated to be reliable (α=.77) and valid, and a global PSQI score greater than 5 points indicates poor sleep quality.

2.3.2. Covid-19 Anxiety: We used Turkish version of Fear of COVID-19 scale to assess subject's anxiety symptoms (Satıcı et al., 2020). The scale developed by Ahorsu et al. (2020) is a unidimensional seven-item, five-point Likert scale. Turkish version has an acceptable reliability (α=.77) and validity value. The increase in the score obtained from the scale shows that the fear of COVID-19 of the individual also increases. The reliability coefficient in this study sample was calculated as .84.

2.3.3. Emotion regulation: The Emotion Management Skills Scale developed by Çeçen (2006) was used. The scale consists of 28 items, eight of which are positive and 20 of which are negative and five sub-dimensions. While scoring the scale, negative items are scored by inverting. The scores that can be obtained from the scale are between 28 and 140. According to the reliability analysis, α (Cronbach Alpha) coefficient was found as .78. The increase in the score obtained from the scale shows that the emotion management skills of the individual also increase. The reliability coefficient in this study sample was calculated as .74.

2.4. Data Collection Procedure and Analysis

The data collection booklet containing the form created to determine demographic features of participants and the measurement tools was created by the researcher. Before participants responded to the paper questionnaire, we asked them to fill out a consent form explaining the purpose of the survey, right of participants to refuse or withdraw, and guarantees of voluntary participation and anonymity. The data collection booklet was converted to an online survey form. The faculty members randomly sent this question list to students. The survey took an average of 20 min to complete.

To test the hypothetical model of this study, we identified descriptive statistics, conducted correlation analysis using SPSS Process 3.5 (Hayes, 2018), and then used the bootstrapping method to estimate the harmonization effects of this model. After repeating the boot processes 5000 times, we reported a significant moderator effect when the 95% confidence interval excludes zero. We estimated the relationship of Covid-19 anxiety and emotion regulation with sleep quality, and then we determined whether gender moderates these relationships.

3. Findings

Prior to testing the hypotheses descriptive statistics of participants' Covid-19 anxiety levels, emotion regulation, and sleep disturbance were calculated. Means, standard deviations (SD), skewness–kurtosis, and correlations between study variables are included in Table 1.

Table 1. *Descriptive Statistics and Correlations for All Variables*

	Poor sleep quality	Covid-19[a] anxiety	Emotion regulation
1. Poor sleep quality	-	-	-
2. Covid-19[a] anxiety	.22**	-	-
3. Emotion regulation.	−.30**	−.11	-
Mean	7.07	15.98	90.87
SD[b]	3.93	5.46	12.28
Skewness	.85	.39	−.50
Kurtosis	.80	−.37	.41

**p ≤ 0.01; [a]coronavirus disease 2019; [b]standard deviation

As seen in Table 1, poor sleep quality, which is the dependent variable of the study, is significantly related to the independent variable Covid-19 anxiety and the ability to manage emotions. Besides, skewness and kurtosis values of the data are between −1, +1, and it seems to have a normal distribution (Tabachnick & Fidell, 2013), which shows that it is suitable for performing parametric tests. In addition, it was observed that the dependent variable was related to the independent variables and there was no high level of correlation between the independent variables. This finding means that the data are suitable for structural equation model (SEM) analysis.

In line with the first and second hypotheses of the study, linear regression analysis was performed to determine whether Covid-19 anxiety and emotion regulation were significant predictors of poor sleep quality. Because independent variables were not significantly correlated, it was not necessary to test for the existence of multicollinearity. Results of the regression analyses are presented in Table 2.

Table 2. *Results of Regression Analyses Predicting the Role of Covid-19 Anxiety and Emotion Regulation on Poor Sleep Quality*

Variables	B	SE	Beta (β)	t	p	R^2	F
Constant	12.03	2.257	-	5.330	0.000	12	9.867**
Covid-19[a] anxiety	.120	.050	.193	2.415	0.017	-	-
Emotion regulation	−.076	.022	−.274	−3.426	0.001	-	-

**p ≤ 0.01, Dependent variable: Poor sleep quality; [a]coronavirus disease 2019

As seen in Table 2, Covid-19 anxiety and emotion regulation were found to be significant predictors of poor sleep quality. Results provided support for H1 and H2. Covid-19 anxiety emerged as a significant predictor of sleep quality (β = .19, p = .011), such that as Covid-19 anxiety increased, poor sleep quality increased. Similarly, emotion regulation significantly predicted sleep quality (β = −.27, p = .001), such that as emotion regulation increased, poor sleep quality decreased. The two variables together explain the 12% variance of sleep quality.

In line with H3 of the study, the Hayes model was used to examine the moderator role of gender in the predictive relationship of Covid-19 anxiety and emotion regulation on sleep quality (Hayes, 2018). Results related to the model are presented in Tables 3 and 4.

Table 3. *Interaction between Covid-19 Anxiety and Gender on Poor Sleep Quality*

Model	β	Se	t	p	95% CI[a]		R^2	F
					Lower	Upper		
Constant	8.230	1.735	4.741	.000	4.798	11.662	.08	4.225*
Covid-19[b]	−.093	.118	−.787	.432	−.328	.141		
Gender	-−4.430	2.002	−2.212	.028	−8.389	−.471		
Int	.292	.132	2.220	.028	.032	.553		
Conditional effect								
Male	−.093	.118	−.787	.432	−.328	.141	-	-
Female	.199	.057	3.467	.000	.085	.313	-	-

* p ≤ 0.05, Dependent variable: Poor sleep quality; [a]95% confidence interval; [b]coronavirus disease 2019

The interaction between Covid-19 anxiety and gender predicted poor sleep quality [β = .29, 95% CI (.03,.55), p = .02, R^2 = .08]. To understand the nature of the interaction, we tested the simple slopes for males and females. An examination of the conditional effects of Covid-19 anxiety on poor sleep quality showed that the simple slopes were significantly different than zero for females (β = .20, t = 3.46, p = .00), but not for males (β = −.09, t = −.78, p = .43, see Figure 2). If 95% CI contains "0," it indicates "statistical non-significance." (Lee, 2016). This finding means that while the sleep quality of women with Covid-19 anxiety is significantly reduced, men with Covid anxiety do not have sleep problems.

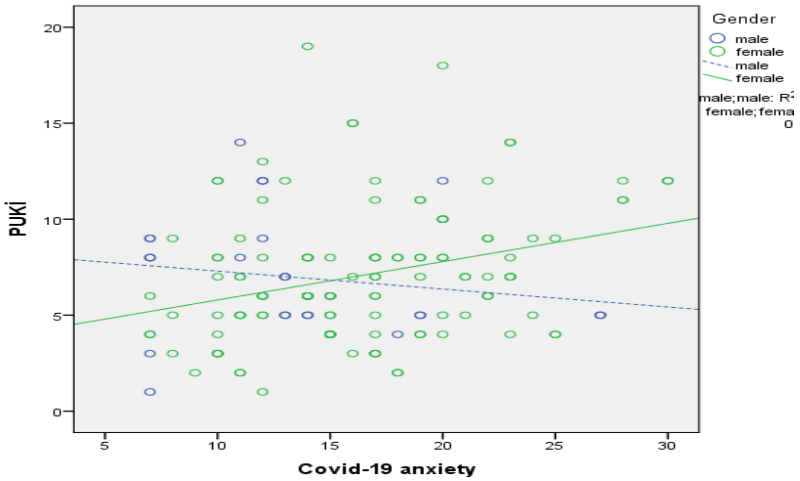

Figure 2. *Moderation Effect of Gender on the Relationship between Covid-19 Anxiety and Poor Sleep Quality*

Table 4. *Interaction between Emotion Regulation and Gender on Poor Sleep Quality*

Model	*β*	Se	t	p	95% CI[a]		R^2	F
					Lower	Upper		
Constant	22.352	5.175	4.319	.000	12.119	32.586		
Em. reg.[b]	−.171	.057	−2.996	.003	−.283	−.058	.11	5.499*
Gender	−9.243	5.631	−1.641	.103	−20.378	1.891		
Int	.105	.062	1.693	.092	−.017	.227		
Conditional effect								
Male	−.171	.057	−2.996	.003	−.283	−.058		
Female	−.066	.024	−2.735	.007	−.113	−.018		

*p ≤ 0.05, Dependent variable: Poor sleep quality; [a]95% confidence interval; [b]emotion regulation

The interaction between emotion regulation and gender did not predict poor sleep quality [β = .10, 95% CI (−.01,.22), p = .09, R^2 = .11]. To understand the nature of the interaction, we tested the simple slopes for males and females. An examination of the conditional effects of emotion regulation on poor sleep quality showed that the simple slopes were significantly different than zero for females (β = −.06, t = −2.73, p = .00) and for males (β = −.17, t = −2.99, p = .00, see Figure 3). This finding shows that the sleep quality of both women and men with poor emotion regulation skills significantly decreases.

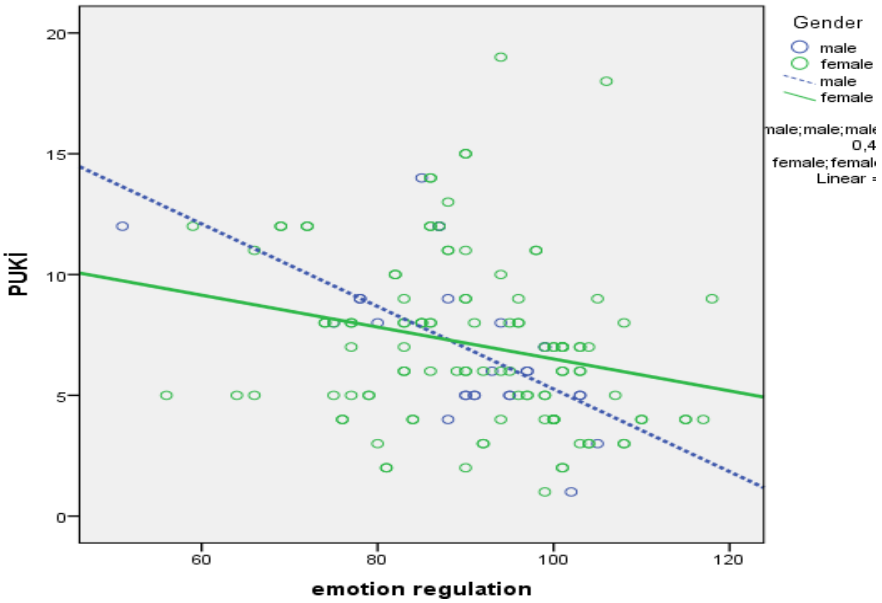

Figure 3. *Moderation Effect of Gender on the Relationship between Emotion Regulation and Poor Sleep Quality*

4. Conclusion and Discussion

The aim of this study is to determine the predictive effect of Covid-19 anxiety and emotion regulation on the sleep quality of university students. Another aim is to examine whether gender has a moderator role in this relationship. When the findings of the research were examined; it was observed that there was a significant decrease in the sleep quality of participants with high Covid-19 anxiety whereas a significant increase in sleep quality was observed in participants with high emotion regulation.

In this study, the Covid-19 anxiety scores of the participants were above average. A survey of more than 50,000 people in China during the Covid-19 epidemic showed that about 35% of the respondents experienced psychological distress (Qiu et al., 2020). This indicates that people in the Covid-19 epidemic process experienced severe anxiety about Covid-19. In fact, anxiety should be considered normal up to a certain point, which can be seen as the body's normal protective response to stress caused by the outbreak (Maunder et al., 2003). However, it seems that the truth is not so, because participants with high Covid-19 anxiety have poorer sleep quality. The first hypothesis of the study—"Covid-19 anxiety is a positive predictor of poor sleep quality" was confirmed.

In support of this finding, it is stated that general anxiety disorder and poor sleep quality are common among people in China where the Covid-19 outbreak started (Huang & Zhao, 2020). In a study with health professionals, almost half of the participants reported that their anxiety levels were high and they experienced insomnia (Lai et al., 2020). In a study conducted in Wuhan, where the epidemic first started, it was found that those with high PTSD values had worse subjective sleep quality (Liu et al., 2020), with people wondering whether the Covid-19 virus will be transmitted to them. Moreover, both fear of illness and uncertainty about the treatment of the disease (Majedi & Majedi, 2020) may often engage people's minds, which negatively affects people's inclination to fall asleep, wake up, and sleep well.

One of the most important contributions of this study to the literature is the third hypothesis. The third hypothesis—the relationship of Covid-19 anxiety and emotion regulation with sleep quality is moderated by gender—has been confirmed. While the quality of sleep of women with high Covid-19 anxiety significantly decreased, it was observed that this relationship was not significant for men.

In studies about anxiety in adolescents (Derdikman-Eiron et al., 2011), university students (Iqbal et al., 2015), and the general public (McLean et al., 2011), it was observed that women have higher anxiety levels and more stress disorders (Liu et al., 2020).

In addition, it was observed that women have more frequent problems with sleep disorders. Zhang and Wing (2006) found that women are 1.41 times more likely to suffer from insomnia. While 45% of adult women had sleep problems, this rate was found to be 30% for adult men (Madrid-Valero et al., 2017). In a study with adolescents, poor sleep quality was observed in 63% of women and 45% of men (Galland et al., 2017). When the results of the research are evaluated together, it is noteworthy that women experience higher anxiety and poorer sleep quality than men.

The second hypothesis of the research claims that those with low emotion regulation skills have poor sleep quality and this hypothesis has been confirmed; there are research findings that support this. For example, it was found that people from different cultures with emotional dysfunctionality experienced poor sleep quality (Kirwan et al., 2019).

Similarly, in studies with married couples in their 30s (Latif et al., 2019) and with individuals in the 18–65 age group (Vantieghem et al., 2016), it was observed that people using the reappraisal emotion regulation strategy had good sleep quality, but those using the suppression strategy had poor sleep quality. In the pandemic process, people experienced many negative emotions and tried various methods of coping with this (Gaeta et al., 2021). However, for those who cannot regulate these feelings in a healthy way, the intensity of emotions may further increase. The sleep quality of people who experience negative emotions also decreases (Rehman et al., 2018).

Another important contribution of this study to the literature was to test the moderator role of gender in the relationship between emotion regulations and sleep quality. However, this part of the third hypothesis has not been confirmed. For both genders, people with emotion regulation dysfunction were found to have poor

sleep quality. The results of the study on this subject in the literature differ from each other. For example, studies show that women experience emotions more intensively (Williams & Barry, 2003), express their emotions more frequently (Mendes et al., 2003), and use a wide variety of emotion regulation strategies (Garnefski et al., 2004).

Although it is stated that women work harder on emotion regulation (McRae et al., 2008) and use more strategies, such as reappraisal, it has also been observed that emotion regulation does not differ in terms of gender (Smrtnik-Vitulić & Prosen, 2016). For example, Debrot et al. (2012) aimed to investigate interpersonal emotion regulation processes in romantic relationships, emphasizing only minor and somewhat inconsistent gender differences between partners. Similarly, van Middendorp et al. (2005) could not find any gender differences in emotion regulation, as well as difficulties in experiencing and explaining emotions. As a result, it can be said that gender is not a moderator between emotion regulation and sleep quality and this relationship exists for both genders.

As a result, it has been observed that people intensely experience Covid-19 anxiety, which results in a decrease in sleep quality. Thus, adequate support should be provided to reduce Covid-19 anxiety, especially to women. In addition, those who have emotion regulation dysfunction should gain skills in this regard in the case of both genders. In this way, sleep quality can be expected to increase.

5. Limitations and Recommendations

This study has several strengths and limitations. It fills the gap in the literature by explaining the moderator role of gender in the relationship of sleep quality with Covid-19 anxiety and emotion regulation. The limitation is that the study was conducted on university students only. Later studies on this subject can be carried out on different age and culture groups.

The findings of the study also offer suggestions for mental health professionals.It has been observed that people intensely experience Covid-19 anxiety, which results in a decrease in sleep quality. Thus, adequate support should be provided to reduce Covid-19 anxiety, especially to women. In addition, those who have emotion regulation dysfunction should gain skills in this regard to increase sleep quality in the case of both genders. Especially during the pandemic period, individuals can be trained to manage their emotions in a healthy way and reduce anxiety.

6. References

Adams, S. K., & Kisler, T. S. (2013). Sleep quality as a mediator between technology-related sleep quality, depression, and anxiety. *Cyberpsychology, Behavior, and Social Networking, 16*(1), 25–30. https://doi.org/10.1089/cyber.2012.0157

Ağargün, M. Y., Kara, H., & Anlar, Ö. (1996). Pittsburgh uyku kalite indeksi'nin geçerliği ve güvenirliği. *Turk Psikiyatri Dergisi 7*(2), 107-15.

Ahorsu, D. K., Lin, C. Y., Imani, V., Saffari, M., Griffiths, M. D., & Pakpour, A. H. (2020) The Fear of COVID-19 Scale: development and initial validation. *International Journal of Mental Health and Addiction*, 1. https://doi.org/10.1007/s11469-020-00270-8

Al-Qaisy, L. M. (2011). The relation of depression and anxiety in academic achievement among group of university students. *International Journal of Psychology and Counselling, 3*(5), 96-100.

Baum, K. T., Desai, A., Field, J., Miller, L. E., Rausch, J., & Beebe, D. W. (2014). Sleep restriction worsens mood and emotion regulation in adolescents. *Journal of Child Psychology and Psychiatry, 55*(2), 180-190.

Bayram, N., & Bilgel, N. (2008). The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. *Social Psychiatry and Psychiatric Epidemiology, 43*(8), 667-672.

Bigalke, J. A., Greenlund, I. M., & Carter, J. R. (2020). Sex differences in self-report anxiety and sleep quality during COVID-19 stay-at-home orders. *Biology of Sex Differences, 11*(1), 1-11.

Buysse, D. J., Reynolds, C. R., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Res, 28*, 193-213.

Chaplin, T. M., Hong, K., Bergquist, K., & Sinha, R. (2008). Gender differences in response to emotional stress: an assessment across subjective, behavioral, and physiological domains and relations to alcohol craving. *Alcoholism: Clinical and Experimental Research, 32*(7), 1242-1250.

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Pearson.

Çeçen, A. R. (2006). Duyguları yönetme becerileri ölçeği'nin geliştirilmesi: Geçerlik ve güvenirlik çalışmaları. *Türk Psikolojik Danışma ve Rehberlik Dergisi, 3*(26), 101-113.

Debrot, A., Cook, W. L., Perrez, M., & Horn, A. B. (2012). Deeds matter: Daily enacted responsiveness and intimacy in couples' daily lives. *Journal of Family Psychology, 26*, 617–627

Derdikman-Eiron, R., Indredavik, M. S., Bratberg, G. H., Taraldsen, G., Bakken, I. J. & Colton, M. (2011). Gender differences in subjective well-being, self-esteem and psychosocial functioning in adolescents with symptoms of anxiety and depression: Findings from the Nord-Trøndelag health study. *Scandinavian Journal of Psychology, 52*, 261–267.

Gaeta, M. L., Gaeta, L., & Rodriguez, M. D. S. (2021). The impact of COVID-19 home confinement on mexican university students: Emotions, coping strategies, and self-regulated learning. *Frontiers in Psychology*, 12, 1323.

Galland, B. C., Gray, A. R., Penno, J., Smith, C., Lobb, C., & Taylor, R. W. (2017). Gender differences in sleep hygiene practices and sleep quality in New Zealand adolescents aged 15 to 17 years. *Sleep Health, 3*(2), 77-83.

Garnefski, N., Teerds, J., Kraaij, V., Legerstee, J., & van den Kommer, T. (2004). Cognitive emotion regulation strategies and depressive symptoms: Differences between males and females. *Personality and Individual Differences, 36*, 267–276.

Goubet, K. E., & Chrysikou, E. G. (2019). Emotion Regulation Flexibility: Gender Differences in Context Sensitivity and Repertoire. *Frontiers in Psychology, 10*, 935.

Gregory, A. M., Buysse, D. J., Willis, T. A., Rijsdijk, F. V., Maughan, B., Rowe R, et al. (2011). Associations between sleep quality and anxiety and depression symptoms in a sample of young adult twins and siblings. *J Psychosom Res. 71*(4), 250–5.

Gross, J. J. (1998). The emerging field of emotion regulation: an integrative review. *Review of General Psychology, 2*(3), 271.

Haberturk, (April, 2020). https://www.haberturk.com/koronavirus-oldugunu-ogrenince-intihar-etti-2636634-spor

Huang, Y., & Zhao, N. (2020). Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. *Psychiatry Research*, 112954.

IMC, (2014). *Assessment of mental health and psychosocial support (MHPSS) needs and resources in the context of Ebola*.

Iqbal, S., Gupta, S., & Venkatarao, E. (2015). Stress, anxiety & depression among medical undergraduate students & their socio-demographic correlates. *The Indian Journal of Medical Research, 141*(3), 354.

Kamara, S., Walder, A., Duncan, J., Kabbedijk, A., Hughes, P. & Muana. A. (2017). Mental health care during the Ebola virus disease outbreak in Sierra Leone. *Bull. World Health Organ., 95*, 842-847.

Kessler, R. C., Chiu, W. T., Demler, O., Merikangas, K. R., & Walters, E. E. (2005). Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry, 62*, 617-627.

Kirwan, M., Svenson, D. W., Pickett, S. M., & Parkhill, M. R. (2019). Emotion regulation as a mediator between sleep quality and interpersonal aggression. *Personality and Individual Differences, 148*, 32-37.

Kyle, S. D., Miller, C. B., Rogers, Z., Siriwardena, A. N.,MacMahon, K. M., & Espie, C. A. (2014). Sleep restriction therapy for insomnia is associated with reduced objective total sleep time, increased daytime somnolence, and objectively impaired vigilance: Implications for the clinical management of insomnia disorder. *Sleep*, *37*(2), 229–237. https://doi.org/10.5665/sleep.3386

Lafrance-Robinson, A., Kosmerly, S., Mansfield-Green, S., & Lafrance, G. (2014). Disordered eating behaviours in an undergraduate sample: associations among gender, body mass index, and difficulties in emotion regulation. *Canadian Journal of Behavioural Science/Revue Canadienne des Sciences du Comportement, 46*, 320-326, doi: 10.1037/a0031123

Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., ... & Tan, H. (2020). Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Network Open, 3*(3).

Latif, I., Hughes, A. T., & Bendall, R. C. (2019). Positive and negative affect mediate the influences of a maladaptive emotion regulation strategy on sleep quality. *Frontiers in Psychiatry, 10*, 628.

Lee, D. K. (2016). Alternatives to P value: confidence interval and effect size. *Korean Journal of Anesthesiology, 69*(6), 555.

Lee, S. M., Kang, W. S., Cho, A. R., Kim, T., & Park, J. K. (2018). Psychological impact of the 2015 MERS outbreak on hospital workers and quarantined hemodialysis patients. *Compr Psychiatry, 87*, 123-127.

Liu, N., Zhang, F., Wei, C., Jia, Y., Shang, Z., Sun, L., ... & Liu, W. (2020). Prevalence and predictors of PTSS during COVID-19 outbreak in China hardest-hit areas: Gender differences matter. *Psychiatry Research*, 112921.

Liu, Y., Zhang, N., Bao, G., Huang, Y., Ji, B., Wu, Y., ... & Li, G. (2019). Predictors of depressive symptoms in college students: A systematic review and meta-analysis of cohort studies. *Journal of Affective Disorders, 244*, 196-208.

Madrid-Valero, J. J., Martínez-Selva, J. M., Couto, B. R. D., Sánchez-Romera, J. F., & Ordoñana, J. R. (2017). Age and gender effects on the prevalence of poor sleep quality in the adult population. *Gaceta Sanitaria, 31*, 18-22.

Mahmoud, J. S. R., Staten, R. T., Hall, L. A., & Lennie, T. A. (2012). The relationship among young adult college students' depression, anxiety, stress, demographics, life satisfaction, and coping styles. *Issues in Mental Health Nursing, 33*(3), 149-156.

Majedi, S., & Majedi, S. (2020). Existing drugs as treatment options for COVID-19: A brief survey of some recent results. *Journal of Chemistry Letters, 1*(1), 2-8.

Mann, R. E., Ialomiteanu, A. R., Chan, V., Cheung, J. T. W., Stoduto, G., Ala-Leppilampi, K., … Rehm, J. (2012). Relationships of alcohol use and alcohol problems to probable anxiety and mood disorder. *Contemporary Drug Problems, 39*(2), 247–263. https://doi.org/10.1177/009145091203900204

Masumoto, K., Taishi, N., & Shiozaki, M. (2016). Age and gender differences in relationships among emotion regulation, mood, and mental health. *Gerontology and Geriatric Medicine, 2*, 2333721416637022.

Mauss, I. B., Troy, A. S., & LeBourgeois, M. K. (2013). Poorer sleep quality is associated with lower emotion-regulation ability in a laboratory paradigm. *Cognition & Emotion, 27*(3), 567-576.

McAlonan, G. M., Lee, A. M., Cheung, V., Cheung, C., Tsang, K. W., Sham, P. C., Chua, S. E., & Wong. J. G. (2007). Immediate and sustained psychological impact of an emerging infectious disease outbreak on health care workers. *Can J Psychiatry, 52*, 241-247. Doi: 10.1177/070674370705200406

McLean, C. P., Asnaani, A., Litz, B. T., & Hofmann, S. G. (2011). Gender differences in anxiety disorders: prevalence, course of illness, comorbidity and burden of illness. *Journal of psychiatric research, 45*(8), 1027-1035.

McRae, K., Ochsner, K. N., Mauss, I. B., Gabrieli, J. J. D., & Gross, J. J. (2008). Gender differences in emotion regulation: An fMRI study of cognitive reappraisal. *Group Processes & Intergroup Relations, 11*(2), 145–162. doi: 10.1177/1368430207088035

Mendes, W. B., Reis, H. T., Seery, M. D., & Blascovich, J. (2003). Cardiovascular correlates of emotional expression and suppression: Do content and gender context matter? *Journal of Personality and Social Psychology, 84*, 771–792.

NTV, (April, 2020). https://www.ntv.com.tr/turkiye/coronadankorunmak-icin-ictigi-dezenfektan-ve-etil-alkol-sonu-oldu,jSQNHxj2xUmn0e1IczA1CA

Paules, C. I., Marston, H. D., & Fauci, A. S.(2020). Coronavirus infections-more than just the common cold. *JAMA, 323*(8), 707-708. doi:10.1001/jama.2020.0757.

Pickett, S. M., Barbaro, N., & Mello, D. (2016). The relationship between subjective sleep disturbance, sleep quality, and emotion regulation difficulties in a sample of college students reporting trauma exposure. Psychological *Trauma: Theory, Research, Practice, and Policy, 8*(1), 25.

Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B., & Xu, Y. (2020). A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *General Psychiatry, 33*(2).

O'Leary, K., Bylsma, L. M., & Rottenberg, J. (2017). Why might poor sleep quality lead to depression? A role for emotion regulation. *Cognition and Emotion, 31*(8), 1698-1706.

Racine, C., Kalra, K., Ceide, M., Williams, N. J., Zizi, F., Mendlowicz, M. V., & Jean-Louis, G. (2013). Sleep duration, insomnia symptoms, and emotion regulation among black women. *Journal of Sleep Disorders & Therapy, 2*(122).

Rajeswari, S., & SanjeevaReddy, N. (2020). Efficacy of progressive muscle relaxation on pregnancy outcome among anxious Indian primi mothers. *Iranian Journal of Nursing and Midwifery Research, 25*(1), 23.

Rehman, A., Gumley, A., & Biello, S. (2018). Sleep quality and paranoia: the role of alexithymia, negative emotions and perceptual anomalies. *Psychiatry Research, 259*, 216-222.

Satici, B., Gocet-Tekin, E., Deniz, M. E., & Satici, S. A. (2020). Adaptation of the Fear of COVID-19 Scale: Its association with psychological distress and life satisfaction in Turkey. *International Journal of Mental Health and Addiction, 1*. https://doi.org/10.1007/s11469-020-00294-0

Smrtnik-Vitulić, H., & Prosen, S. (2016). Coping and emotion regulation strategies in adulthood: Specificities regarding age, gender and level of education. *Društvena Istraživanja: Časopis Za Opća Društvena Pitanja, 25*(1), 43-62.

Spaapen, D. L., Waters, F., Brummer, L., Stopa, L., & Bucks, R. S. (2014). The Emotion Regulation Questionnaire: Validation of the ERQ-9 in two community samples. *Psychological Assessment, 26*, 46-54.

Sutton, E. L. (2014). Psychiatric disorders and sleep issues. *Medical Clinics of North America, 98*(5), 1123-1143. https://doi.org/10.1016/j.mcna.2014.06.009

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6. Ed.). Pearson

Taherdoost, H. (2016). Sampling methods in research methodology; how to choose a sampling technique for research. *International Journal of Advance Research in Management, 5*(2), 18-27.

Tavernier, R., & Willoughby, T. (2015). A longitudinal examination of the bidirectional association between sleep problems and social ties at university: The mediating role of emotion regulation. *Journal of youth and Adolescence, 44*(2), 317-330.

Tung, Y. J., Lo, K. K., Ho, R. C., & Tam, W. S. W. (2018). Prevalence of depression among nursing students: A systematic review and meta-analysis. *Nurse Education Today, 63*, 119-129.

van Middendorp, H., Geenen, R., Sorbi, M. J., Hox, J. J., Vingerhoets, A. J. J. M., van Doornen, L. J. P., & Bijlsma, J. W. J. (2005). Gender differences in emotion regulation and relationships with perceived health in patients with rheumatoid arthritis. *Women & Health, 42*(1), 75–97.

Vantieghem, I., Marcoen, N., Mairesse, O., & Vandekerckhove, M. (2016). Emotion regulation mediates the relationship between personality and sleep quality. *Psychology & Health, 31*(9), 1064-1079.

Vriend, J. L., Davidson, F. D., Corkum, P. V., Rusak, B., Chambers, C. T., & McLaughlin, E. N. (2013). Manipulating sleep duration alters emotional functioning and cognitive performance in children. *Journal of Pediatric Psychology, 38* (10), 1058-1069.

Williams, L. M., & Barry, J. (2003). Do sex differences in emotionality mediate sex differences in traits of psychosis-proneness? *Cognition and Emotion, 17*, 747–758.

World Health Organization, (2020a). *Coronavirus disease (COVID-19) pandemic*. Accessed July 14, 2020. https://www.who.int/emergencies/diseases/novel-coronavirus-2019

World Health Organization, (2020b). *Current novel coronavirus (2019-nCoV) outbreak*. Accessed July 14, 2020. https://www.who.int/health-topics/coronavirus

Zhang, B., & Wing, Y. K. (2006) Sex differences in insomnia: a meta-analysis. *Sleep. 29*, 85-93.