Research Article

Psychological reactions of different affective temperaments to the COVID-19 pandemic

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Abstract

Various studies show that the temperament characteristics of individuals play a decisive role in how much and how they will be affected by traumatic events. However, no research has been found in the literature examining the relationship between affective temperament and trauma. The Covid 19 pandemic process is described as a social trauma. In this context, in this study, it is aimed to examine the reactions of different affective temperaments to social trauma within the framework of the pandemic. Within the scope of the research, the Depression, Anxiety and Stress Scale (DASS-21) and Temperament Evaluation of Memphis, Pisa, Paris, San Diego Autoquestionaire (TEMPS-A) were used. The scales were applied online to a total of 1075 volunteer participants (653 women and 422 men). Multiple regression analysis was conducted to determine the significance of temperament types in the prediction of depression, anxiety, and stress levels of individuals. The method employed was stepwise regression analysis. In the data obtained, it was observed that depression, anxiety, and stress levels and anxious, cyclothymic, depressive, and irritable temperament types showed a positive correlation at different levels and a low level of negative correlation with hyperthymic temperament type during the pandemic process. The four aforementioned affective temperament types were significant predictors for depression, three were predictors for stress, and two for anxiety. Additionally, the results of this study indicated that hyperthymic temperament can be protective against the effects of trauma.

Keywords: depression, anxiety, stress, temperament, COVID-19

1. Introduction

The 2019 coronavirus disease (COVID-19) is a global health threat that originated in China (1). The World Health Organization (WHO) has declared the COVID-19 outbreak a public health emergency of international concern (2). According to WHO data, as of June 30, 2020, the number of people diagnosed with the disease has exceeded 10,000,000 and the number of people who have died from the virus is more than 500,000 (https://covid19.who.int/). The epidemic has not only threatened health and life, but it has also caused economic, social, cultural, and psychological effects (3,4).

If we look at the psychological effects of the pandemic, the research conducted by Wang et al. (2020) (5) in China when the virus first appeared can be a good example. According to the results of this study research, 53.8% of participants were psychologically affected by the epidemic at a moderate or severe level and 16.5% gave depression, 28.8% anxiety, 8.1% stress reactions, and the evaluation undertaken after 4 weeks revealed there has not seen a significant change in these levels (5). As another example, in the study conducted by Mazza et al. (2020) (6) in Italy, it was determined that 22.4% of society experienced high levels of

depression, 27.2% stress, and 18.7% anxiety during the pandemic. when considering the pandemic in the light of these findings, it is possible to describe this process as a disaster accompanied by psychological traumas (7, 8).

Disasters can be defined as the consequences of natural, technological, and anthropogenic events that directly affect people and cause physical, economic, social, and environmental losses to human settlements, affecting communities by stopping or interrupting human activities in normal life (9, 10). The stressor factors that occur in the event of a disaster do not affect every individual in the environment at the same level (11). As a matter of fact, different research has been providing different results about the prevalence of post-natural disaster traumatic stress disorder (12). This situation has been indicating that individuals' levels of psychological reactions to disasters may differ (13, 14). Although there may be many reasons for these differences, some studies have revealed that the temperament characteristics of individuals are a significant parameter for the psychological effects of trauma (15, 16). In this sense, findings of research conducted by Strelau and Zawadzki

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(2004) (17) has been showed that one of the best predictors of the risk of developing post-traumatic stress disorder in individuals who had experienced trauma was temperament traits.

In general, temperament is composed of continuous(chronic) emotional, thought, and behavioral traits with a structural, biological, and genetic basis (18). In other words, temperament includes the predominance of various emotional states and a tendency to experience similar emotional responses to similar events. Since the time of Hippocrates, humans have considered there to be different temperamental traits. About 2,500 years ago, Hippocrates developed the "Theory of Temperament," which included four temperaments (liquids) that he labelled blood, phlegm, yellow bile, and black bile. In the last century, Kraepelin defined temperament in terms of four basic affects or types: depressive, hyperthymic, irritable, and cyclothymic (19). Akiskal et al. (1987) (20) introduced the concept of affective temperament by adding anxious temperament to these four temperament types defined by Kraepelin.

Since affective temperament is generally thought to be associated with mood disorders, it has been studied frequently in that context (21-25). However, studies related to affective temperaments are rare in relation to other areas, including trauma. In this study, therefore, we examined the relationship between affective temperaments and reactions to the pandemic, which we define as psychological trauma. We associated our work with the depression, anxiety, and stress concepts, which are described as the most common psychological reactions during the COVID-19 epidemic, presented in the review study by (26).

In general, the aim of this study is to determine the effects of five affective temperament types (anxious, cyclothymic, irritable, depressive, and hypertimic) on depression, anxiety and stress and the importance of these effects during the pandemic.

2. Subject and Methods

In this research, the descriptive method was used in the relational scanning model. The aim of this research model is to determine whether there is a change between two or more variables, and if there is a change, its level (27).

2.1. Sample

The research population consisted of individuals from 18–80 years of age residing in Turkey. According to 2019 data from The Turkey Statistic Institute (TSI), the number of people in this age bracket in Turkey is 56,108,215't. Thus, the number of suitable samples to be taken from this group for research is 1,067, with a 95% confidence interval and ± 3 margins of error. In the research, online forms were delivered to 1800 people within the simple random sampling method. Of those who sent the online form, 1075 participated in the research and filled out the form completely. In this context, a total of 1,075 participants (653 women and 422 men) were included

in the study. The sociodemographic details of the sample have presented in Table 1The online forms were disseminated to individuals between in the aforementioned age group via social media, and there were no participation criteria for individuals in this age range other than volunteering. Since the online form used in the research was based on the obligation of the participants to answer all questions without exception, there was no missing data. The details about the sample have presented in Table 1.

Table 1. Sociodemographic variables

Variable		n	%	SD
Gender	Women	653	60.7	±.48
	Men	422	39.3	
Age	18-30	510	47.4	±1.03
	31-40	282	26.2	
	41-50	174	16.2	
	51-60	99	9.2	
	60 and over	10	.9	
Marital status	Married	576	53.6	±.53
	Single	477	44.4	
	Divorced	22	2.0	
Education	Primary	81	7.5	±1.31
	High School	151	14.0	
	Bachelor	682	63.4	
	Postgraduate	161	15.0	

2.2. Data collection tools

Depression, Anxiety and Stress Scale (DASS-21): This scale was developed by Lovibond and Lovibond (1995) (28) and Turkish adaptation studies were carried out by (29). Validity and reliability studies showed that the Cronbach's alpha internal consistency reliability coefficient is $\alpha = 0.89$ for the depression subscale, $\alpha = 0.87$ for the anxiety subscale, and $\alpha = 0.81$ for the stress subscale. In addition, the scale was found to differ for the patient population and normal individuals in terms of depression, anxiety, and stress: major depression (mean depression score = 13.27; anxiety mean score = 09.03; mean stress score = 12.10), anxiety disorders (mean depression score = 11.23; anxiety mean score = 10.70; mean stress score = 12.37) and normal individuals (mean depression score = 3.23; anxiety mean score = 2.41; mean stress score = 3.99) (F = 2.306, p = 0.00). Thus, the obtained psychometric properties show that the DASS-21 is a valid and reliable measurement tool to determine levels of depression, anxiety, and stress. In this study, the Cronbach alpha coefficients obtained for depression, anxiety and stress subscales were .84, .80, and .86, respectively.

Temperament Evaluation of Memphis, Pisa, Paris, San Diego Autoquestionaire (TEMPS-A): This questionnaire, which was developed by Akiskal et al. (2005) (30), is a Likert-type scale that consists of 5 sub-dimensions that determine depressive, cyclothymic, hyperthymic, nervous, and anxious temperaments. The Turkish adaptation study of the scale was conducted by (31). In the Turkish form of the scale, the test-retest reliability ranged from 0.73 to 0.91 and the internal consistency was from 0.77 to 0.85. In this context,

it was confirmed in the adaptation study that the 5-factor structure should be preserved and the scale had a valid and reliable structure. The Cronbach's alpha values obtained with the data in this study were .78 in the depressive subscale, .88 in the cyclothymic subscale, .80 in the hyperthymic subscale, .84 in the irritable subscale, and .88 in the anxious subscale.

2.3. Data collection

Data were collected via online forms in accordance with the measures recommended due to the COVID-19 outbreak. In the statement introducing the data collection tools, it was made clear that the research was voluntary, personal information would not be requested, the participants' only responsibility was to fill out the forms completely and truthfully, and the data would only be evaluated collectively, meaning no individual's responses would be singled out.

In this way, the participants were fully informed about their rights and what would be expected of them during the process.

2.4. Data analysis

In this study, correlation analysis was used to understand the relationship between the valuables, and multiple regression analysis was conducted to determine how important temperament types are in predicting the depression, anxiety, and stress levels of individuals. The stepwise regression method was used in this research. The model assumptions were examined, and the suitability of the model for regression analysis was tested. First, no autocorrelation was found in the model (Durbin-Watson = 2.0). Second, there was no problem related to multiple connections between the explanatory variables (VIF < 5). Standardized residuals and Cooks values were checked, and contrary observations were found (13 piece observation was not included in the analysis). The multiple correlation coefficient for the model was determined to be R = 0.714 and corrected to R2 = 50.6%. The estimated regression model was found to be generally significant (P = 0.000 < 0.001).

3. Results

First, in order to provide a general perspective in the study, the correlation results between affective temperament types, depression, anxiety, and stress scores are presented below.

Table 2. Correlation between temperament types, depression, anxiety, and stress

Dimensions	Depressive	Cyclothymic	Hyperthymic	Irritable	Anxious	Depression	Anxiety	Stress
Depressive	1							
Cyclothymic	.585**	1						
Hyperthymic	-.373**	-.075*	1					
Irritable	.435**	.622**	.002	1				
Anxious	.590**	.675**	-.118**	.591**	1			
Depression	.477**	.533**	-.159**	.457**	.536**	1		
Anxiety	.383**	.465**	-.080**	.396**	.575**	.674**	1	
Stress	.372**	.503**	-.086**	.467**	.536**	.774**	.748**	1

**p<.001

When the values in Table 2 are examined, it is evident that depressive temperament has a moderate positive correlation with depression (r = .47, p < .01), anxiety (r = .38, p < .01), and stress (r = .37, p < .01). Similarly, cyclothymic temperament is positively correlated with depression (r = .53, p < .01), anxiety (r = .46, p < .01), and stress (r = .50, p <.01). Looking at the hyperthymic temperament, there is a low level of negative correlation with depression (r = -.15, p < .01),

anxiety (r = -.08, p < .01), and stress (r = -.08, p < .01). Irritable temperament type is positively correlated with depression (r = .45, p < .01), anxiety (r = .39, p < .01), and stress (r = .46, p < .01). Finally, anxious temperament, which is the fifth temperament type considered in the study, showed a positive and moderate correlation with depression (r = .53, p < .01), anxiety (r = .57, p < .01), and stress (r = .53, p < .01).

Table 3. Hierarchical regression analysis to determine the temperament types that predict depression

Predictors	β	Sβ	t	p	R²	R^2_{adj}
Anxious	.157	.230	6.495	.000**	.406	.403
Cyclothymic	.163	.227	6.245	.000**		
Depressive	.131	.125	3.712	.000**		
Irritable	.162	.164	5.168	.000**		
Hyperthymic	-.046	-.053	-2.023	.043*		

**p< .001, *p< .05

In Table 3, affective temperament types are given in order of their depression-explanation power. Accordingly, the temperament type with the most power to explain depression is anxious temperament. Affective temperament types explain 40% of depression in total (R_adj^2=.403). Anxious

temperament, depression (33%), cyclothymic temperament (31%), irritable temperament (21%), depressive temperament (11%), and hyperthymic temperament contribute .3% to this explanation power. In general, it was observed that four temperament types (excluding hyperthymic temperament)

were positive for depression while hyperthymic temperament was a negative predictor. Finally, the predictive power of the five temperament types was significant.

Table 4. Hierarchical regression analysis to determine temperament types that predict anxiety

Predictors	β	Sβ	t	p	R^2	R^2_{adj}
Anxious	.248	.508	15.383	.000**	.377	.376
Cyclothymic	.074	.143	4.327	.000**		

**p< .001

The values in Table 4 show that anxious and cyclothymic temperaments have significant effects in explaining anxiety, and the power of predicting anxiety in the other three affective temperament types is not statistically significant. The two affective temperament types together explain about 37% of anxiety ($R\_adj^2=.376$). When the levels of contribution to this explanatory power are examined, it is revealed that anxious temperament contributes 91% and cyclothymic temperament 9%.

Table 5: Hierarchical regression analysis to determine temperament types that predict stress

Predictors	β	Sβ	t	p	R^2	R^2_{adj}
Anxious	.210	.307	8.785	.000**		
Cyclothymic	.140	.194	5.683	.000**	.359	.357
Irritable	.185	.187	5.390	.000**		

**p<.001

When Table 5 is examined, it is seen that anxious, cyclothymic, and irritable temperament types have important effects in explaining stress. These three affective temperament types together explain about 36% of stress ($R\_adj^2=.357$). When examined in terms of their contribution to the explanatory power, it was revealed that anxious temperament contributed 54%, irritable temperament 25%, and cyclothymic temperament 21%.

4. Discussion

The COVID-19 pandemic has psychologically affected individuals, as well as directly and indirectly affected humanity as a social trauma (32). During the pandemic, many studies have been carried out on depression, anxiety, and stress levels that have led to significant findings (6, 33,5,1). The affective temperament types defined by Akiskal (1987) (19) were used in this study to examine the relationship between temperament types, which are predictors of psychological responses to trauma (16, 17), depression-anxiety, and stress responses. Although Akiskal (1987) (20) has defined these temperament types, he suggested that mood disorders should be viewed within a spectrum (34). In particular, Akiskal et al. (1980) (35) described subthreshold temperament traits that did not require treatment at one end and pathological processes up to psychosis at the other.

In the data obtained in this study, depression anxiety-stress levels and all temperament types (anxious, cyclothymic, depressive, irritable, and hyperthymic) showed a significant correlation at different levels during the pandemic process. If we examine these findings with Akiskal's spectrum approach, we can say that as the affective temperament features become clear, the person approaches the pathological end. In psychiatry, pathology is generally expressed as the deterioration of an individual's adjustment. Since we define the COVID-19 pandemic as a traumatic period in which many adaptations are required, it was expected that adaptation would deteriorate with the prominence of affective temperament features, thus increasing depression-anxiety and stress responses in a correlated way.

While our normal expectation is that depressive temperament should show a higher correlation with depression compared to other temperament types, in our study, it was observed that anxious and cyclothymic temperaments were more correlated with depression. This may actually be an indication that the study was conducted during a traumatic period rather than under normal conditions. The fact that trauma-related disorders fall under the heading of anxiety disorders up to DSM-IV (American Psychiatric Association 2000) supports the relationship of trauma to anxiety and, therefore, to anxious temperament.

The concept of intolerance to uncertainty, which is directly related to anxious temperament, is accepted as the main component underlying anxiety disorders (36). In the study conducted by Satici et al. (2020) (4) during the COVID-19 pandemic, it was shown that psychological wellbeing was negatively affected by the increase in levels of uncertainty and intolerance. This finding supports the higher correlation of anxious temperament in all the parameters (depression, anxiety, and stress) compared to all other temperaments, and its prediction of all three parameters.

Another temperament type that was predictive for all three parameters was cyclothymic temperament. Powers et al. (2015) (15) found that emotional dysregulation associated with cyclothymic temperament predicted dissociative symptoms as a result of post-traumatic stress disorder (PTSD) (14). Additionally, variable self-esteem and emotional instability are also considered to be components of cyclothymia (37). Similarly, Kashdan et al. (2006) (38) found in their study that variable self-esteem and emotional

instability were significantly more intense in the group that developed PTSD among those exposed to the same trauma compared to the group that did not develop PTSD (38). Both studies support our findings by showing that processes associated with cyclothymic temperament increase responses to trauma.

Strelau (1996) (39) describes six temperament traits in the regulative theory of temperament: briskness, perseverance, sensory sensitivity, emotional reactivity, endurance, and activity. In the study of Oniszczenko et al. (2017) (40) comparing the regulative temperament types with the affective temperament types, it was observed that there was a positive correlation between emotional reactivity and persistence from regulative temperament theory and anxious, cyclothymic, irritable, and depressive temperaments from the affective temperament model. In Oniszczenko's (2014) (41) study, emotional reactivity and post-traumatic reactions were found to increase in firefighters. In the study conducted by Oniszczenko and Laskowska (2014), (42) high emotional reactivity was shown to intensify cancer-related trauma symptoms in adult patients. Strelau and Zawadzki (2005) (16) found that persistence and emotional reactivity increase the effects of trauma, and emotional reactivity in all samples is the best predictor of the intensity of PTSD symptoms. In another similar study, the authors' results showed that emotional reactivity increased trauma symptom intensity in HIV positive participants (43). Finally, Zawadzki and Popiel (2012) (44) discovered that emotional reactivity increased the symptoms of PTSD together with the severity of the trauma.

In all these studies related to regulative temperament, there are significant relationships among emotional reactivity and persistence and traumatic reactions. In our affective temperament study, a positive correlation was found between anxious, cyclothymic, irritable, and depressive temperament types and post-traumatic reactions on depression, anxiety, and stress scales. In addition, all the above-mentioned affective temperament types were significant predictors for depression, three temperament types (anxious, cyclothymic, irritable) for stress, and two temperament types (anxious, cyclothymic) for anxiety. Considering the relationship between affective temperament types and regulatory temperament traits, it can be said that related research supports the findings of our study. It has been observed that vitality, emotional sensitivity, and resilience characteristics, especially activity in regulatory temperament theory, are related to the hyperthymic temperament type in affective temperament theory (40). In Oniszczenko's (2014) (41) study, vitality associated with hyperthymic temperament showed a negative correlation with post-traumatic symptoms in soldiers. Another similar study found that vitality temperament traits can protect against the development of PTSD (44). Temperament characteristics, such as vitality and endurance, have also been seen to function as buffers that reduce the effect of traumatic events (16). In our study, hyperthymic temperament was negatively

correlated with each of the variables of depression, anxiety, and stress. In addition, it was found to be a negative low but significant predictor for depression. In other words, it is understood that certain hyperthymic tendencies are preventive for depression. When considered as a whole, these studies suggest that hyperthymic temperament can be protective against the effects of trauma.

In this study, it was understood that there is a relationship between affective temperament types and depression, anxiety, and stress during the Covid-19 pandemic process. When the details of the research are examined, it is understood that while hyperthymic temperament is a negative predictor for depression, anxious, cyclothymic, depressive, and irritable temperaments are positive predictors for depression. Additionally, the results revealed that anxious, cyclothymic, and irritable temperament types were significant predictors for stress. Anxious and cyclothymic temperament types were significant predictors for anxiety. Hyperthymic temperament was negatively correlated with depression, anxiety, and stress. Considering these results, it can be stated that hyperthymic temperament is protective against the effects of trauma.

It should be noted that this research has some limitations. Due to the pandemic conditions, online data collection method was used in the study. The general limitations of the online data collection method are also valid for this research. Secondly, the measurement tool used in the research is generally aimed at determining the levels of depression, anxiety, and stress. It is not a measuring tool that directly addresses the pandemic. This may be a limitation. In order to eliminate this limitation, the participants were asked to evaluate each question under pandemic conditions. Finally, this study examined the effects of directly affective temperament types on depression, anxiety, and stress. There may be some demographic intermediary variables that can affect this relationship. In this study, direct effect was examined and mediator effects were not considered. This study drew attention to the scarcity of studies examining the relationship between affective temperament and trauma. However, studying affective temperament types in relation to different areas in the field of trauma should provide significant benefits.

In this study, it was clear that the anxious temperament was the most affected by the pandemic. Therefore, a more detailed examination of the relationship between the anxiety spectrum and the pandemic process is important in terms of identifying groups at risk and providing more effective biopsychosocial support.

Conflict of Interest

The authors declare that they have no conflict of interest.

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Ethical Approval

This study was approved by the Ethical Committee of Erzincan Binali Yildirim University. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration.

Data Availability Statement

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

References

1. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. Lancet. 2020 Feb 15;395(10223):470-473. doi: 10.1016/S0140-6736(20)30185-9. Epub 2020 Jan 24. Erratum in: Lancet. 2020 Jan 29;: PMID: 31986257; PMCID: PMC7135038.

1. Mahase E. China coronavirus: WHO declares international emergency as death toll exceeds 200. BMJ. 2020 Jan 31;368:m408. doi: 10.1136/bmj.m408. PMID: 32005727.

2. Jarynowski A, Wójta-Kempa M, Płatek D & Czopek K: Attempt to understand public-health relevant social dimensions of covid-19 outbreak in poland. Society Register 2020; 4(3): 7–44.

3. Satici B, Saricali M, Satici SA, Griffiths MD. Intolerance of Uncertainty and Mental Wellbeing: Serial Mediation by Rumination and Fear of COVID-19. Int J Ment Health Addict. 2020 May 15:1-12. doi: 10.1007/s11469-020-00305-0. Epub ahead of print. PMID: 32427165; PMCID: PMC7228430.

4. Wang C, Pan R, Wan X, Tan Y, Xu L, McIntyre RS, Choo FN, Tran B, Ho R, Sharma VK, Ho C. A longitudinal study on the mental health of general population during the COVID-19 epidemic in China. Brain Behav Immun. 2020 Jul;87:40-48. doi: 10.1016/j.bbi.2020.04.028. Epub 2020 Apr 13. PMID: 32298802; PMCID: PMC7153528.

5. Mazza C, Ricci E, Biondi S, Colasanti M, Ferracuti S, Napoli C, Roma P. A Nationwide Survey of Psychological Distress among Italian People during the COVID-19 Pandemic: Immediate Psychological Responses and Associated Factors. Int J Environ Res Public Health. 2020 May 2;17(9):3165. doi: 10.3390/ijerph17093165. PMID: 32370116; PMCID: PMC7246819.

6. Sayeed A, Kundu S, Al Banna MH, Christopher E, Hasan MT, Begum MR, Chowdhury S, Khan MSI. Mental Health Outcomes of Adults with Comorbidity and Chronic Diseases during the COVID-19 Pandemic: A Matched Case-Control Study. Psychiatr Danub. 2020 Autumn-Winter;32(3-4):491-498. doi: 10.24869/psyd.2020.491. PMID: 33370758.

7. Şanlı E & Kefeli M: Research of the factors affecting depression, anxiety and stress levels of individuals in the Covid-19 pandemic process. Asean Journal of Psychiatry 2021; 22 (2): 1-13

8. Işıklı S & Tüzün Z: Psychosocial Intervention for Early Phase Psychological Effects of Disasters. J Psychol-Special Topics 2017; 2(3): 180–188. Retrieved from http://www.turkiyeklinikleri.com/article/tr-afetlerin-akut-donem-psikolojik-etkilerine-yonelik-psikososyal-mudahale-yaklasimlari-80106.html

9. Al-Qahtani AM, Elgzar WT, Ibrahim HA. COVID-19 Pandemic: Psycho-social Consequences During the Social Distancing Period Among Najran City Population. Psychiatr Danub. 2020 Summer;32(2):280-286. doi: 10.24869/psyd.2020.280. PMID: 32796799.

10. Kukuoğlu A: Doğal Afetler Sonrası Yaşanan Travmalar ve Örnek Bir Psikoeğitim Programı. Journal of Danub. 2020 Summer;32(2):280-286. doi: 10.24869/psyd.2020.280. PMID: 32796799.Disaster and Risk 2018; 1(1): 39–52. Retrieved from http://dspace.ankara.edu.tr/xmlui/handle/20.500.12575/70014

11. Bromet EJ, Atwoli L, Kawakami N, Navarro-Mateu F, Piotrowski P, King AJ, Aguilar-Gaxiola S, Alonso J, Bunting B, Demyttenaere K, Florescu S, de Girolamo G, Gluzman S, Haro JM, de Jonge P, Karam EG, Lee S, Kovess-Masfety V, Medina-Mora ME, Mneimneh Z, Pennell BE, Posada-Villa J, Salmerón D, Takeshima T, Kessler RC. Post-traumatic stress disorder associated with natural and human-made disasters in the World Mental Health Surveys. Psychol Med. 2017 Jan;47(2):227-241. doi: 10.1017/S0033291716002026. Epub 2016 Aug 30. PMID: 27573281; PMCID: PMC5432967.

12. Salopek-Žiha D, Hlavati M, Gvozdanović Z, Gašić M, Placento H, Jakić H, Klapan D, Šimić H. Differences in Distress and Coping with the COVID-19 Stressor in Nurses and Physicians. Psychiatr Danub. 2020 Summer;32(2):287-293. doi: 10.24869/psyd.2020.287. PMID: 32796800.

13. Franza F, Solomita B, Tavormina G. Loneliness and Hopelesness: Their Role in the Depressive Cases during the COVID Pandemia. Psychiatr Danub. 2021 Sep;33(Suppl 9):14-17. PMID: 34559771.

14. Powers A, Cross D, Fani N, Bradley B. PTSD, emotion dysregulation, and dissociative symptoms in a highly traumatized sample. J Psychiatr Res. 2015 Feb;61:174-9. doi: 10.1016/j.jpsychires.2014.12.011. Epub 2014 Dec 23. PMID: 25573648; PMCID: PMC4308496. Strelau J & Zawadzki B: Trauma and temperament as predictors of intensity of posttraumatic stress disorder symptoms after disaster. European Psychologist 2005; 10 (2). https://doi.org/10.1027/1016-9040.10.2.124

15. Strelau J & Zawadzki B: Trauma and temperament as predictors of intensity of posttraumatic stress disorder symptoms after disaster. European Psychologist 2005; 10 (2). https://doi.org/10.1027/1016-9040.10.2.124

16. Strelau J & Zawadzki B: Trauma and temperament as predictors of posttraumatic stress disorder and its dimensions 3, 15 months and two years after experiencing flood. Polish Psychological Bulletin 2004; 35 (1). Retrieved from https://psycnet.apa.org/record/2004-14102-001

17. Aslan S & Yancar DE: Affective Temperaments and Personality Features of Patients with Recurrent and Single Major Depressive Disorder. Turkish Journal of Clinical Psychiatry 2008; 11: 61–71.

18. von Zerssen D, Akiskal HS. Personality factors in affective disorders: historical developments and current issues with special reference to the concepts of temperament and character. J Affect Disord. 1998 Oct;51(1):1-5. doi: 10.1016/s0165-0327(98)00151-7. PMID: 9879798.

19. Akiskal HS, Mallya G. Criteria for the "soft" bipolar spectrum: treatment implications. Psychopharmacol Bull. 1987;23(1):68-73. PMID: 3602332.

20. Fico G, Caivano V, Zinno F, Carfagno M, Steardo LJ, Sampogna G, Luciano M, Fiorillo A. Affective Temperaments

and Clinical Course of Bipolar Disorder: An Exploratory Study of Differences among Patients with and without a History of Violent Suicide Attempts. Medicina (Kaunas). 2019 Jul 19;55(7):390. doi: 10.3390/medicina55070390. PMID: 31331102; PMCID: PMC6681298.

21. İnanlı İ, Çalışkan AM, Tanrıkulu AB, Çiftci E, Yıldız MÇ, Yaşar SA, Eren İ. Affective temperaments in caregiver of patients with bipolar disorder and their relation to caregiver burden. J Affect Disord. 2020 Feb 1;262:189-195. doi: 10.1016/j.jad.2019.10.028. Epub 2019 Oct 20. PMID: 31668995.

22. Palagini L, Miniati M, Caruso D, Massa L, Novi M, Pardini F, Salarpi G, Pini S, Marazziti D, Etain B, Riemann D. Association between affective temperaments and mood features in bipolar disorder II: The role of insomnia and chronobiological rhythms desynchronization. J Affect Disord. 2020 Apr 1;266:263-272. doi: 10.1016/j.jad.2020.01.134. Epub 2020 Jan 22. PMID: 32056887.

23. Perry A, Gordon-Smith K, Webb I, Fone E, Di Florio A, Craddock N, Jones I, Jones L. Postpartum psychosis in bipolar disorder: no evidence of association with personality traits, cognitive style or affective temperaments. BMC Psychiatry. 2019 Dec 12;19(1):395. doi: 10.1186/s12888-019-2392-0. PMID: 31830938; PMCID: PMC6909498.

24. Saito T, Toda H, Inoue T, Koga M, Tanichi M, Takeshita S, Nakagawa R, Nagamine M, Masuya J, Tanabe H, Shimizu K, Kusumi I, Yoshino A. Relationship between the subtypes of child abuse and affective temperaments: Comparison of depression and bipolar disorder patients and healthy controls using the reclassified Child Abuse and Trauma Scale. J Affect Disord. 2019 Oct 1;257:396-403. doi: 10.1016/j.jad.2019.06.043. Epub 2019 Jul 1. PMID: 31306990.

25. Rajkumar RP. COVID-19 and mental health: A review of the existing literature. Asian J Psychiatr. 2020 Aug;52:102066. doi: 10.1016/j.ajp.2020.102066. Epub 2020 Apr 10. PMID: 32302935; PMCID: PMC7151415.

26. Karasar N: Scientific research methods. Ankara: Nobel Publishing 2005.

27. Lovibond PF, Lovibond SH. The structure of negative emotional states: comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. Behav Res Ther. 1995 Mar;33(3):335-43. doi: 10.1016/0005-7967(94)00075-u. PMID: 7726811.

28. Yıldırım A, Boysan M & Kefeli MC: Psychometric properties of the Turkish version of the Depression Anxiety Stress Scale-21 (DASS-21). British Journal of Guidance & Counselling 2018; 46 (5): 582–595.

29. Akiskal HS, Akiskal KK, Haykal RF, Manning JS, Connor PD. TEMPS-A: progress towards validation of a self-rated clinical version of the Temperament Evaluation of the Memphis, Pisa, Paris, and San Diego Autoquestionnaire. J Affect Disord. 2005 Mar;85(1-2):3-16. doi: 10.1016/j.jad.2004.12.001. PMID: 15780671.

30. Vahip S, Kesebir S, Alkan M, Yazici O, Akiskal KK, Akiskal HS. Affective temperaments in clinically-well subjects in Turkey: initial psychometric data on the TEMPS-A. J Affect Disord. 2005 Mar;85(1-2):113-25. doi: 10.1016/j.jad.2003.10.011. Erratum in: J Affect Disord. 2006 Jun;92(2-3):313. PMID: 15780682.

31. Garfin DR, Silver RC, Holman EA. The novel coronavirus (COVID-2019) outbreak: Amplification of public health consequences by media exposure. Health Psychol. 2020 May;39(5):355-357. doi: 10.1037/hea0000875. Epub 2020 Mar 23. PMID: 32202824; PMCID: PMC7735659.

32. Rajkumar RP. COVID-19 and mental health: A review of the existing literature. Asian J Psychiatr. 2020 Aug;52:102066. doi: 10.1016/j.ajp.2020.102066. Epub 2020 Apr 10. PMID: 32302935; PMCID: PMC7151415.

33. Akdeniz F, Kesebir S, Vahip S, Gönül AS. Duygudurum Bozukluklari ile Mizaç Arasinda Ilişki Var mi? [Is there a relationship between mood disorders and affective temperaments?]. Turk Psikiyatri Derg. 2004 Fall;15(3):183-90. Turkish. PMID: 15362002.

34. Akiskal HS, Rosenthal TL, Haykal RF, Lemmi H, Rosenthal RH, Scott-Strauss A. Characterological depressions. Clinical and sleep EEG findings separating 'subaffective dysthymias' from 'character spectrum disorders'. Arch Gen Psychiatry. 1980 Jul;37(7):777-83. doi: 10.1001/archpsyc.1980.01780200055006. PMID: 7396655.

35. Morriss J, Christakou A, van Reekum CM. Nothing is safe: Intolerance of uncertainty is associated with compromised fear extinction learning. Biol Psychol. 2016 Dec;121(Pt B):187-193. doi: 10.1016/j.biopsycho.2016.05.001. Epub 2016 May 10. PMID: 27178640; PMCID: PMC5154327.

36. O'Brien E, Bartoletti M, & Leitzel, JD:. Self-esteem, psychopathology, and psychotherapy. In Kernis MH (ed): Self-esteem issues and answers: A sourcebook of current perspectives, 306–315. New York: Psychology Press, 2006.

37. Kashdan TB, Uswatte G, Steger MF, Julian T. Fragile self-esteem and affective instability in posttraumatic stress disorder. Behav Res Ther. 2006 Nov;44(11):1609-19. doi: 10.1016/j.brat.2005.12.003. Epub 2006 Jan 30. PMID: 16445887.

38. Strelau J: The regulative theory of temperament: Current status. Personality and Individual Differences 1996; 20 (2). https://doi.org/10.1016/0191-8869(95)00159-X

39. Oniszczenko W, Stanisławiak E, Dembińska-Krajewska D & Rybakowski J: Regulative theory of temperament versus affective temperaments measured by the temperament evaluation of Memphis, Pisa, Paris and San Diego Auto-questionnaire (TEMPS-A): a study in a non-clinical Polish sample. Current Issues in Personality Psychology 2017; 2. https://doi.org/10.5114/cipp.2017.65847

40. Oniszczenko W. Temperamental correlates of trauma symptoms in firemen, policemen and soldiers. Int J Occup Med Environ Health. 2014 Aug;27(4):599-607. doi: 10.2478/s13382-014-0287-3. Epub 2014 Jul 18. PMID: 25034907.

41. Oniszczenko W, Laskowska A. Emotional reactivity, coping style and cancer trauma symptoms. Arch Med Sci. 2014 Feb 24;10(1):110-6. doi: 10.5114/aoms.2013.33069. Epub 2013 Feb 18. PMID: 24701223; PMCID: PMC3953964.

42. Rzeszutek M, Oniszczenko W, Firlǎg-Burkacka E. Temperament traits, coping style and trauma symptoms in HIV+ men and women. AIDS Care. 2012;24(9):1150-4. doi: 10.1080/09540121.2012.687819. Epub 2012 Jun 18. PMID: 22702407.

43. Zawadzki B & Popiel A: Temperamental traits and severity of PTSD symptoms. Journal of Individual Differences 2012; 33 (4). https://doi.org/10.1027/1614-0001/a000074