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The Relationship between Neuroticism and Psychological Distress in the Covid-19 Pandemic: The Mediating Role of Perceived Stress and Loneliness

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Abstract

Introduction: Whenever there is an outbreak of infectious diseases, psychosocial impact has been observed on individual and social levels globally. The psychological and social effects of the COVID-19 epidemic are potential and widespread, which affect people's mental health in the long term. The present study aimed to investigate the role of neuroticism in predicting psychological distress through perceived stress and loneliness in covid-19.

Method: This research was carried out in the form of correlation and structural equations. The statistical population of the research was all the students of Azarbaijan Shahid Madani University, 300 of whom were selected through convenience sampling, and the neuroticism scale was from the short form of the Neo questionnaire, the Cohen et al.'s perceived stress questionnaire, the Kessler psychological distress questionnaire, and the loneliness scale. Social Emotional Assessment for Adults (SELSA-S) was administered to them. Then the obtained data were analyzed using Spss26 and Amos22 software.

Results: The results showed that neuroticism is related to psychological distress through loneliness and perceived stress. Also, there is a positive and significant relationship between the components of loneliness, perceived stress, and neuroticism with stress, anxiety, and depression.

Conclusion: Therefore, considering the increasing spread of psychological distress, it is necessary to reduce people's psychological distress by teaching self-care skills and stress management.

Keywords: Loneliness, Perceived stress, Psychological distress, Neurosis, Covid-19.

Introduction

The COVID-19 pandemic is the greatest public health crisis in a century (Mahalik, Di Bianca & Harris, 2022). This global disaster combines systemic risks and aggravates health, economic, and political crises, especially in developing countries (Formighieri Giordani et al., 2022).

COVID-19 as a global stressor and threat has prepared the ground for an unprecedented crisis in the social field (emotional, psychological, and economic). Covid-related stress and negative mental health outcomes are widespread among different population groups (Brooks et al., 2020; Minahan et al., 2021). Quarantine and pandemics in general can be considered strong events that are very new, disruptive, and critical and therefore likely to affect people's perceived stress. Specifically, such events may frustrate need satisfaction (e.g., the need for independence and relatedness as proposed by Ryan and Deci) and consume and threaten valuable personal resources such as time, energy, and health (Hobfull, 2011; cited in Zacher & Rudolph, 2021). Perceived stress indicates low emotional well-being

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or high pressure due to its occurrence. Assessing the situation as a (potentially) uncontrollable threat to personal goals and resources (Lazarus & Folkman, 1984; Peacock & Wang, 1990; cited in Zacher & Rudolph, 2021). A survey study conducted in early May 2020 in Canada found that extraversion and lower emotional stability were associated with higher perceived stress during the pandemic (Liu et al., 2020).

In general, personality is one of the factors that may explain individual differences in response to challenging situations (Han et al., 2021). One of the key models for classifying and operationalizing personality traits is the five-factor model of personality (or Big-5), which defines personality as a system with neuroticism, extroversion, openness to experience, agreeableness, and Conscientiousness classified as higher-order domains (Costa and McCree, 1999; cited in Eckizer et al., 2022). In a study, Modersizaki et al. (2020) emphasized the strong relationship between the psychological consequences of the COVID-19 pandemic and individual-level variables such as personality traits, especially mood. Besser et al. (2020) argue that some personality factors can act as risk factors during the pandemic, while others can play a protective role in terms of adapting to the current situation and coping with it. Therefore, it is important to understand the point of view that identifies the important factors of vulnerability to the negative emotions related to the pandemic disease; we selected the Big Five personality trait model to determine whether neuroticism was confirmed as a vulnerability factor (Nikčević et al., 2021).

Researchers believe that neuroticism, which is defined as the tendency to experience negative affect, especially when threatened, failed, or faced with loss (Ormel et al., 2013), is the single most important factor associated with many forms of psychopathology and behavioral health. Among them are anxiety disorders, depression, and substance abuse (Kato et al., 2010; Lahi, 2009). Therefore, neuroticism has a positive and significant relationship with anxiety (Shi et al., 2015, Sepahvand and Bayat, 2021) and the results of research related to personality factors also specifically report the role of neuroticism during the Covid-19 pandemic (Kohut et al., 2021).

During the pandemic, there was also a clear increase in mental distress associated with Covid-19. In the experience of psychological distress in particular, it has been argued that anxious people show a pattern of vigilance towards a threat over time (Albery et al., 2021). People who have a lower distress tolerance, under stressful conditions, show avoidance behaviors or do not express their feelings, and in order to quickly reduce their distress, they continue the avoidance behaviors as a behavioral pattern. They are defective (Hasan et al., 2017) In a very recent study conducted at the height of the pandemic (April 2020), Lee et al (2020) showed that neuroticism moderated both generalized anxiety and depressive symptoms after controlling for a wide range of demographic variables (such as age, gender, etc.), covid-19 factors (eg, infected status) and vulnerability factors for experiencing psychological distress during a pandemic (health anxiety and reassurance-seeking behaviors) investigated whether neuroticism was associated with health anxiety it is related. This study also showed that there is a positive correlation between neuroticism and covid-19 anxiety.

In general, the direct effects of the coronavirus pandemic have been on physical health and the number of deaths caused by it, but we cannot ignore its indirect effects on the human psyche. To minimize the spread of COVID-19, many countries have imposed restrictions on physical contact, from recommendations to maintain physical relationships

and distance from others to community quarantines (Dahlberg, 2021). According to recent studies, due to quarantine and social distancing measures, there is an alarming increase in loneliness levels (Horigianet al., 2020; van der Velden et al., 2021). As might be expected, during the COVID-19 pandemic, loneliness is closely related to worry, depression, and anxiety (Hoffart et al., 2020; Palgi et al., 2020; Tso and Park, 2020; Killgore et al., 2020).

In general, the perception that the epidemic wave is in its final stages can be an independent predictor of riskier behaviors (Sinyavskaya et al., 2024). Also in all pandemics, there are common factors that interact with the personality factors of affected people and determine the degree of people›s susceptibility to the pandemic. Therefore, the results of the present study can help to identify the role of influential personality factors in all special medical conditions, especially pandemics. The current research has focused on this issue with an emphasis on the occurrence of similar situations in the future.

With these explanations, various studies have examined the relationship between personality dimensions related to the epidemic; however, none of them have addressed the simultaneous role of neuroticism, perceived stress, and loneliness with psychological distress. For this reason, the current research seeks to find the answer to the following question: «Is neuroticism able to predict psychological distress in the COVID-19 pandemic through perceived stress and loneliness?»

Method

Participants

The present research was carried out in the form of a correlation and structural equation design. The statistical population of this research was all students of Azerbaijan ShahidMadani University. The sample size was determined by referring to Klein's (2015) strategy for studies that use the structural equation modeling method. Klein (2015) suggests that the minimum sample size ratio for each observed variable is 5 people, the ratio of 10 people for each variable is considered more appropriate and the ratio of 20 people for each variable is considered desirable Therefore, in the current research, considering the possibility of removing samples, as well as the high reliability of the findings and better generalization, a sample of 300 students was selected using the available method. The demographic variables of the selected sample are presented in the results section.

Measures

The NEO-FFI, Perceptual Stress Questionnaire (PSS), Kessler's Psychological Distress Questionnaire, and Social Emotional Loneliness Scale for Adults (SELSA-S) were implemented on them. To collect data, the link of the questionnaires was distributed and collected among the research sample through an internet call, and the collected questionnaires were used for analysis. Finally, the resulting data were analyzed using Spss26 and Amos22 software.

*NEO Personality Factor Questionnaire (NEO-FFI):*This questionnaire is a shortened form of the NEO personality questionnaire prepared by Costa and McCree (1992). This questionnaire with 60 questions is used to evaluate five big personality factors, and 12 questions are designed for each personality factor. These factors include neuroticism, extroversion, openness, agreeableness, and conscientiousness. This questionnaire is scored on a Likert system and the subject must choose the most suitable answer in a 5-point scale from completely agree to completely disagree concerning his personality characteristics. The reliability of this questionnaire was reported by

Cronbach's alpha between 0.68 (for agreeableness) and 0.86 (for neuroticism). In a 7-year longitudinal study of peer evaluation, reliability coefficients of 0.63 to 0.81 have been obtained for the five factors. In Iran, Haqshanas (1387) reached similar results on a sample of 502 people from the population of Shiraz; Cronbach's alpha coefficients are equal to C=0.83, A=0.71, O=0.57, E=0.71, and N=0.81, and the validity of the re-evaluation test after 6 months is A=0.6, O=0.76, and N=0.74 E=0 and N=0.53 have been obtained (Fathi Ashtiani, 2015). Cronbach's alpha was calculated as 0.78 in the present study.

Perceived stress questionnaire (PSS): This questionnaire was created by Cohen et al. in 1983 and is used when we want to know how stressful a person's life situations are in his opinion (Zimmet et al., 1990; quoted by Saeidian et al., 2021). This scale has 14 questions with a five-point Likert scale from zero (never) to four (always). Questions 6, 7, 9, 10, 4, 5, and 13 are scored reversely. This questionnaire evaluates the two subscales of negative and positive perceptions of stress. And it expresses the arduousness of the stress of life during the past month. The reliability of the tool in the research of Saeidian et al. (2021) was calculated by internal consistency and Cronbach's alpha coefficient of 0.9. Cronbach's alpha coefficient was calculated at 0.88 in the present study.

Psychological Distress Scale: Kessler's Psychological Distress Questionnaire, which examines the patient's mental state during the last month, was prepared by Kessler et al. (2003) in the form of 10 questions. The answers to the questions are on five Likert options, scored between 0-4, and the maximum score is 40. The conducted research shows a strong relationship between high scores in this questionnaire and the diagnosis of mood and anxiety disorders. Vasiliadis et al. (2015; quoted by Pourhosseini Dehkordi et al. (2018) reported the reliability and validity of this questionnaire as acceptable. Pourhosseini-Dehkordi et al (2018) in Iran reported the reliability of the questionnaire with Cronbach's alpha method of 0.85. Cronbach's alpha was calculated as 0.83 in the present study.

Social Emotional Loneliness Scale for Adults (SELSA-S): This scale was designed and prepared by Di Tommaso, Brannen, and Best (2004) based on the Weiss classification. This scale includes 15 items and three subscales, romantic loneliness (five items), family (five items), and social (five items). In front of each item, there is a range of options from completely disagree (score 1) to completely agree (score 5). All the items, except for items 14 and 15, are scored reversely. A higher score in each of the dimensions of this scale indicates a greater feeling of loneliness in that dimension. In Iran, the reliability and validity of this scale were investigated in some research. The results confirmed the existence of three factors: romantic loneliness with 4 items, family loneliness with 5 items, and romantic, social, and family loneliness were equal to 0.92, 0.84, and 0.87 respectively (Jokar & Salimi, 2013; quoted from Mahmoudpour et al., 2019). Cronbach's alpha coefficient was calculated as 0.92 in the present study.

Results

The obtained data were analyzed using descriptive and inferential statistical methods. Descriptive analysis showed that the studied group was (155) women and (145) men in terms of gender. The age range of 35.7 percent of people was between 20 and 30, 38 percent of people were between 31 and 40, and 26.3 percent of people were between 41 and 50 years old. The demographic characteristics of the studied sample are shown in Table 1.

In the following, the descriptive indices related to the research variables and the subscales related to each are presented.

In the above table, the mean and standard deviation

Table 1. Demographic characteristics of the studied sample

Specification		Frequency(number)	Perecent
Age range	3020-	107	35/7
	4031-	114	38
	5041-	79	26/3
gender	Female	155	51/7
	male	145	48/3
marital status	Single	194	64/7
	married	106	35/3
education	diploma	78	26
	Associate Degree	19	6/3
	Bachelor‘egreed	99	33
	Master	96	32
	Phd	8	2/7

Table 2. Mean and standard deviation of research variables

Variable	Component	Average	Standard deviation	Skewness	Kurtosis
Feeling lonely	Romantic loneliness	14/64	3/72	-0/44	-0/53
	family loneliness	18/93	4/66	-0/77	-0/78
	Social loneliness	16/30	4/48	-0/34	-0/33
	Total feeling of loneliness	49/88	11/18	-0/04	-0/65
Perceived Stress	Positive perceived stress	5/32	4/55	1/82	1/32
	Negative perceived stress	4/32	4/36	1/42	1/28
	The total score of perceived stress	9/64	8/40	1/62	1/28
Psychological distress	Depression	6/97	5/73	-0/53	0/65
	Stress	8/97	5/63	-0/77	0/31
	Anxiety	5/63	4/78	0/15	0/85
	Total psychological distress score	21/57	14/62	-0/48	0/52
Neurosis		16/83	6/24	2/18	1/36

Table 3. Correlation matrix of research variables

Variable	1	2	3	4	5	6	7	8	9	9
Romantic loneliness	1									
family loneliness	0/69*	1								
Social loneliness	0/59*	0.60*	1							
Positive Stress	0/29*	0/28*	0/33*	1						
Negative Stress	0/30*	0/32*	0/41*	0/77*	1					
Anxiety	0/36*	0/31*	0/38*	0/45*	0/55*	1				
Depression	0/32*	0/25*	0/35*	0/30*	0/42*	0/69*	1			
Stress	0/38*	0/35*	0/40*	0.40*	0/53*	0/72*	0/75*	1		
Neurosis	0/30*	0/30*	0/38*	0/45*	0/54*	0/43*	0/36*	0/45*	1	

P<0.01*

of the scores related to the research variables are presented. Also, in the other two columns of the table, the results of skewness and Kurtosis are given for the normality of the data. As can be seen, the skewness and elongation indices of all obvious variables are between -2 and 2, which indicates the normality of the distribution of the variables and their suitability for path analysis. First, the correlation matrix of research variables is as follows.

As can be seen in the above table, there is a positive and significant relationship between the components of loneliness, perceived stress, and neuroticism with stress, anxiety, and depression. Other correlations between research variables are shown in the above table. It is worth noting that all correlations were significant at the P<0.01 level. Before carrying out the structural equations, its presuppositions were checked. Including the non-existence of co-linearity of the variables, the correlation between the independent variables (pre-inter) was less than 0.90, based on which there was no concern about the possibility of co-linearity of the variables. The assumption of normality of the data was checked using skewness and kurtosis scores in table (2) and the results indicated the normality of the data. In addition, before performing the relevant analysis, univariate outliers were identified using a box plot and the results showed no outliers in the data. Also, in addition to the assumption of normality, the Durbin-Watson statistic (DW=1.81) was used for the independence of errors, and the results showed that this assumption was established. Also, the assumption of multiple collinearity was investigated using the tolerance statistics and the variance inflation factor, and the results showed that none of the tolerance values was higher than 1 and none of the variance inflation values was higher than 10, which indicates the validity of this assumption. Examining the sample size adequacy index (0.84) and Bartlett's sphericity index (df=36 and p<0.01) showed that the necessary criteria for structural equation modeling were met. In the following, the findings related to the measurement models of the research variables are presented.

Table 4.

Index	IFI	NFI	CFI	AGFI	GFI	P	X^2/df	d.f	X^2	RMSEA
Suggested criteria	0/90≤	0/90≤	0/90≤	0/90≤	0/90≤	≤0/05	≤3	_	_	≤0/08
Reported value	0/97	0/95	0/97	0/95	0/96	0/001	2/65	23	61/02	0/074

To check this conceptual model, the structural equations model was used. According to the presented model, it is expected that neuroticism is related to psychological distress through the feeling of loneliness and perceived stress. The results related to the fit indices of the model are presented in the following table, according to Ho and Bentler's (1999) criteria, the model has a good fit.

The results of Table 4 show that there is a good fit between the data and the model. The standardized path coefficients of the conceptual model are shown in Figure 1.

The unstandardized coefficients of the paths of the conceptual model are also shown in Figure (2).

Table 5 shows the direct effects between research variables.

According to the results of Table 5, all the direct

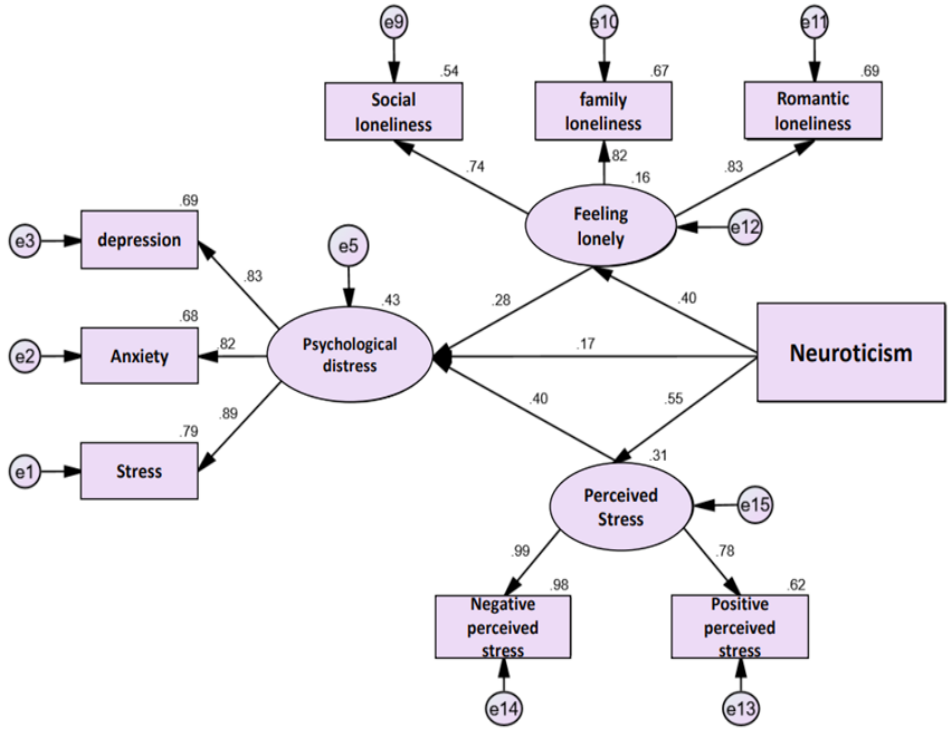

Figure 1. Standard coefficients of the conceptual model

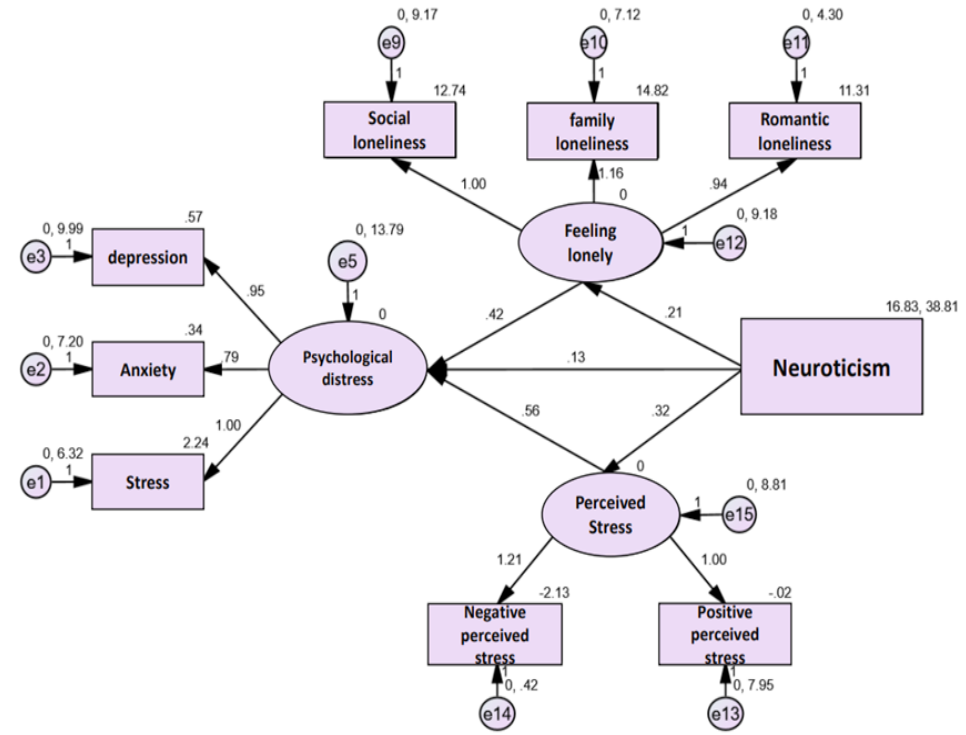

Figure2. Unstandardized coefficients of the conceptual model

paths were statistically significant, and the bootstrap test was used to check the significance of the indirect path.

Table5. Standard coefficients of direct paths

	Criterion variable	C.R	standard error	T	Standard coefficient	P	Result
Neurosis	loneliness	6/39	0/033	0/40	0/21	0/0001	Confirmation
Neurosis	Psychological distress	2/56	0/052	0/17	0/13	0/010	Confirmation
Loneliness	Psychological distress	9/61	0/091	0/28	0/42	0/0001	confirmation
perceived stress	Psychological distress	6/38	0/088	0/40	0/56	0/001	confirmation
Neurosis	perceived stress	8/84	0/036	0/55	0/32	0/001	confirmation

Also, the coefficient of an indirect effect of neuroticism on psychological distress through the mediating role of loneliness (β=0.11, P=0.010) and perceived stress (β=0.22, P=0.003) was significant. According to the bootstrap results, the indirect path of the model was confirmed. As a result, the perceived stress and the feeling of loneliness could mediate significantly between predictor and criterion variables in a partial and not total way.

Table 6. The results of the bootstrap test of the indirect effects of the research model

P	Low limit	Upper limit	standard error	Indirect effect	Directions
0/010	0/107	0/411	0/085	0/11	loneliness Neurosis Psychological distress
0/003	0/056	0/247	0/071	0/22	Neurosis perceived stress Psychological distress

Discussion

Considering that the dangers of global diseases such as COVID-19 threaten the health of all humans, dealing with psychological injuries during that time can empower us to face future events. So the purpose of this study was to explain the mediating role of perceived stress and loneliness in neuroticism and psychological distress. The analysis showed that neuroticism is related to psychological distress through perceived stress and loneliness. Also, there is a positive and significant relationship between neuroticism and psychological distress. These findings are in line with the results of other studies such as (Ikizer et al., 2022; Zacher et al., 2021; Nikcevic et al., 2021; van der Velden et al., 2021; Killgore et al., 2020; Harijin et al., 2020; Lee et al., 2020; Modersitzki et al., 2020).

During the pandemic, there was a clear increase in mental distress related to Covid-19. Psychological distress is a state of emotional distress and suffering that is defined by symptoms of depression (such as loss of interest, sadness, and hopelessness) and anxiety (such as restlessness and feeling tense) and may be accompanied by physiological symptoms (such as insomnia, headache and lack of energy) (Mirowsky & Ross, 2002). Low distress tolerance is associated with a wide range of disorders, including self-injurious behaviors (Anestis et al., 2013), major depressive disorder, and severe impulsive behaviors (Anestis et al., 2013) is closely related. In the experience of psychological distress in particular, it has been argued that anxious people show a pattern of vigilance towards a threat over time (Albery et al., 2021). People who have a lower distress tolerance, under stressful conditions,

show avoidance behaviors or do not express their feelings, and to quickly reduce their distress, they continue the avoidance behaviors as a behavioral pattern. They are defective (Hasan et al., 2017).

Research results indicate that psychological distress may affect individuals› social performance and daily life (Hosni & Shah Moradifar, 2013). Distress tolerance has a multidimensional nature and has dimensions that include the ability to tolerate, evaluate, and accept the emotional state, the way to regulate emotions by the individual and the amount of attention to negative emotions and the amount of its contribution to the occurrence of functional impairment (Leyro) et al., 2010). On the other hand, neuroticism is also defined as the tendency to experience negative emotions, especially when threatened, failed, or faced with loss (Ormel et al., 2013). Neuroticism is the single most important factor associated with many forms of psychopathology and behavioral health, including anxiety disorders and depression (Kato et al., 2010; Lahey, 2009). Therefore, neuroticism has a positive and significant relationship with anxiety (Shi et al., 2015, Sepahvand and Bayat, 1400) and the results of research related to personality factors also specifically report the role of neuroticism during the Covid-19 pandemic (Kohut et al., 2021). Therefore, during the COVID-19 epidemic, neurotic people have suffered more stress than normal people, which has caused an increase in their psychological distress.

Also, in terms of physical distancing, the COVID-19 epidemic increased the risk of side effects such as increased loneliness in people. Due to the amount of stress and pressure that people suffer, this loneliness causes problems such as depression and anxiety. In general, it causes psychological distress in people. The direct effects of the coronavirus pandemic have been on physical health and the number of deaths caused by it, but one cannot ignore its indirect effects on the human psyche (Dalberg, 2021). According to recent studies, due to quarantine and social distancing measures, there is an alarming increase in loneliness levels (Horigian et al., 2020; Van Der Velden et al., 2021). As might be expected, during the COVID-19 pandemic, loneliness is closely related to worry, depression, and anxiety (Hoffart et al., 2020; Palgi et al., 2020; Tso & Park, 2020; Killgore et al., 2020).

On the other hand, a significant factor related to stress and loneliness during the COVID-19 pandemic is personality characteristics (Taylor, 2020). In general, those suffering from COVID-19 tend to show high levels of psychological distress, such as post-traumatic stress, stress, and health anxiety (Chong et al., 2004; Wheaton et al., 2012; cited in Albery et al. colleagues, 2021) that may continue beyond the pandemic period. For this reason, it is essential to understand individual differences in the types of mental distress related to COVID-19 as the identification of behaviors that may hinder psychological adaptation. In this regard, people with neurotic personality traits are more likely to report unpleasant feelings of loneliness. Because loneliness is a subjective experience that evokes feelings of insecurity and subsequent hypervigilance against social threats, it is vulnerable during a global pandemic for people with neuroticism. It is accompanied by psychological distress, and thus these people maintain the inability to bear uncomfortable feelings and deal with uncertainty about the threats related to the epidemic.

Limitation

One of the limitations of the current research is the difficulty in generalizing its results to clinical samples. Therefore, it is suggested that future research be conducted with a larger number of participants by using more detailed methods, such

as structured clinical interviews to discover more and wider information. According to the findings, self-care skills can help people manage challenges and psychological distress. Injuries and trauma caused by some incidents such as Covid-19 can plague people for a long time. Therefore, it is suggested that the necessary information should be provided regarding increasing coping skills with such conditions so that people are less harmed when natural and social hazards occur.

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