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Original Article

Psychological Effects of the COVID-19 Pandemic

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Abstract

Background and objectives: The COVID-19 pandemic has caused symptoms of anxiety, distress, and depression in the general population. In order to develop interventions that target psychological problems, it is necessary to determine individual factors that have an impact on the development of psychological problems. The present study examined the effects of emotion dysregulation, attachment style and perceived social support on psychological problems in the context of COVID-19 using a sample of people living in Türkiye.

Methods: The sample consisted of 517 participants. In addition to the Demographic and COVID-19-related Information Form, a number of questionnaires were used, including the Depression, Anxiety and Stress Scale (DASS-21), Experiences in Close Relationships Revised (ECR-R), Impact of Event Scale Revised (IES-R), Difficulties in Emotion Regulation Scale-Brief Form (DERS-16), and Multidimensional Scale of Perceived Social Support (MSPSS).

Results: The findings revealed that perceived social support, emotion dysregulation and attachment anxiety did not have serial mediation effects in the relationship between the impact of COVID-19, and depression or stress. However, there were serial mediating effects of perceived social support, emotion dysregulation, and attachment anxiety in the relationship between the impact of COVID-19 and anxiety. That is, the effects of the impact of COVID-19 (X) on anxiety (Y) through emotion dysregulation (M2) and attachment anxiety (M3) (bootstrap = 0.007, 95% CI = −0.001, 0.015), and through perceived social support, emotion dysregulation, and attachment anxiety (bootstrap = 0.005, 95% CI = 0.001, 0.013) were significant.

Conclusion: These findings suggest the role of individual appraisals in the initial stages of the COVID-19 outbreak.

Introduction

The psychological effects of the COVID-19 pandemic can be considered to be similar to those of any catastrophic event, such as natural disasters or other unexpected debilitating events that affect populations.[1] Studies have revealed that this pandemic is associated with psychological problems, although the rate varies across different studies.[2–4] Furthermore, evidence has indicated the increase in the level of psychological problems during the initial months of this pandemic,[5] as well as the delayed effect of the pandemic on psychological stress.[6] On the other hand, longitudinal studies have suggested that these levels remain stabilized over time.[7] In the context of the COVID-19 pandemic, in order to develop interventions that target psychological problems, it is necessary to determine the individual factors that trigger these psychological problems. These factors may include emotion regulation, attachment style, and social support.

Literature reveals that emotion dysregulation action can moderate psychological distress in the general population.[8] Another study reported that lack of impulse control and clarity, as dimensions of emotion regulation, were associated with post-COVID-19 disease-related psychological distress in patients ≥60 years old, who recovered from the COVID-19 disease.[9] Within the context of the COVID-19 pandemic, emotion regulation strategies, such as reappraisal, refocus and suppression, can predict post-traumatic stress disorder (PTSD) symptoms, stress, anxiety and depression.[10–13] Indeed, evidence has also suggested that difficulties in regulating emotions are risk factors for psychological problems, such as depression and stress,[14] and that reappraisal and suppression are mediators in the relationship between perceived parental

Keywords: Clinical health psychology; Attachment style; Trauma; Psychological well-being; Social support..

Abbreviations: DASS-21, Depression, Anxiety and Stress Scale; DERS-16, Difficulties in Emotion Regulation Scale-Brief form; ECR-R, Experiences in Close Relationships-Revised; IES-R, Impact of Event Scale-Revised; MSPSS, Multidimensional Scale of Perceived Social Support; PTSD symptoms, post-traumatic stress symptoms.

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support and depression.[15]

Previous studies have indicated that secure attachment protects against psychological problems, while insecure attachment increases the risk of psychological problems.[16–18] Reviews indicate that insecure attachment is related to susceptibility to physical illness and poor illness prognosis.[19] In the context of the COVID-19 pandemic, a study reported that adult attachment styles were risk factors for psychological distress.[2] Similarly, another study indicated that a higher level of anxious attachment was associated with higher levels of PTSD and depressive symptoms, while higher levels of both anxious attachment and avoidant attachment were associated with higher levels of anxiety symptoms.[20]

Documented evidence has suggested that emotions are regulated based on the attachment style, and that attachment avoidance is associated with the inability to acknowledge negative emotions.[21,22] Consistent with this evidence, individuals faced with the threat of the COVID-19 pandemic are expected to use emotion regulation strategies specific to their attachment style.

Evidence on the effect of social support on psychological problems remains mixed. Some evidence has suggested that social support increases the experience of positive emotions, and reduces that of negative emotions.[23,24] Positive social interactions can protect individuals from psychological problems, while negative social interactions or withdrawing from others can increase the risk.[25,26] Other evidence has suggested that social support disrupts emotional well-being, within the context of chronic illness.[27,28] In the context of the COVID-19 pandemic, a study revealed that individuals who reported higher perceived social support reported lower depression.[29] In another study,[15] as a specific type of social support, higher parental support was found to be associated with lower depressive symptoms. Similarly, evidence has suggested that higher social connectedness is associated with fewer psychological symptoms, such as anxiety and depression.[30] A study revealed that participants who reported higher attachment avoidance reported that their partners were less supportive.[31] On the contrary, attachment anxiety did not predict the perception of partner support.

Recent literature has revealed that attachment style, emotion dysregulation, and social support influence the manner by which individuals experience psychological problems in the context of the COVID-19 pandemic. However, as far as the authors are aware, no study has attempted to examine all these effects in a single study. Therefore, the present study aimed to examine these effects on people living in Türkiye.

Materials and methods

Sample

The sampling method used for the present study was convenience sampling. A total of 728 adults participated in the study. Among these participants, 17 participants who did not answer most of the questions and 194 participants who did not complete one of the outcome measures, including the Depression, Anxiety and Stress Scale (DASS-21, refer below), were excluded from the study. The final sample included 517 participants. Among these participants, 71.2% (n = 366) were female and 28.8% (n = 148) were male, and the mean age of all participants was 36.57 years old (standard deviation [SD] = 12.98, range: 18–73 years old). Furthermore, 77.5% of the participants were college or university graduates, and 30.7% (n = 158) and 60% (n = 309) of the participants evaluated their health status before the COVID-19 pandemic as very good and good, respectively. Moreover, approximately 44% of the participants perceived the risk of having the COVID-19 disease as low. The demographic and COVID-19-related characteristics are presented in Tables 1 and 2.

Measures

The Demographic and COVID-19-related Information Forms and six questionnaires were used. The Demographic and COVID-19-related Information Forms were constructed by the authors to assess the demographic characteristics, such as age, and COVID-19-related characteristics, such as perceived general health before the COVID-19 pandemic and perceived risk of COVID-19 disease.

Stress, anxiety, and depression were assessed using the Depression, Anxiety and Stress Scale (DASS-21),[32] symptoms of post traumatic stress were assessed using the Impact of Event Scale-Revised (IES-R),[33] attachment style was assessed using the Experiences in Close Relationships-Revised (ECR-R),[34] difficulties experienced in regulating emotions (emotion dysregulation) were assessed using the Difficulties in Emotion Regulation Scale-Brief form (DERS-16),[35] and social support from family, friends and significant others was assessed using the Multidimensional Scale of Perceived Social Support (MSPSS).[36] These scales were adapted for people living in Türkiye.[37–41] Table 3 presents the mean, normal distribution, and Cronbach's alpha values.

Procedure

After receiving the ethics approval, the consent form, Demographic and COVID-19-related Information Form, and all the questionnaires were uploaded to Qualtrics, and the link was circulated via E-mail, social media, and WhatsApp groups. The inclusion criteria were, as follows: ≥18 years old, people living in Türkiye, people who were able to read, and people who did not have any mental disabilities. Upon completion, a list of free psychological counseling services was provided to the participants, when needed.

Statistical analysis

SPSS 24.0 was used to perform the statistical analyses. The kurtosis, skewness, and Cronbach's alpha values were determined, the correlation coefficients were computed, and serial multiple mediation models were tested.[42] The significance was evaluated at $p < 0.01$ and $p < 0.05$.

Results

Correlational analyses

The correlation coefficients revealed that difficulties in emotion regulation (emotion dysregulation) were positively and significantly correlated with all outcome measures. In addition, attachment anxiety and perceived social support were significantly, but negatively, correlated with all outcome measures. On the other hand, attachment avoidance was positively and significantly correlated with stress and depression, but not with anxiety or PTSD symptoms (Table 4).

Serial mediation effects

Three models were tested (Fig. 1). In the first model, the effects of the impact of COVID-19 on depression (c path) (B: 0.123, SE: 0.011; 95% confidence interval [CI]: 0.100, 0.145; t: 10.823, p = 0.001) and emotional dysregulation (B: 0.499, SE: 0.031; 95% CI: 0.438, 0.560; t: 16.038, p = 0.001) were positive and significant. On the other hand, the effects of the impact of COVID-19 on perceived social support (B: −0.242, SE: 0.040; 95% CI: −0.321,

Table 1. Demographic characteristics

Variable	*n*	%
Gender		
Female	366	71.2
Male	148	28.8
Age	36.57 ± 12.98	
Education		
Secondary school or lower	23	4.5
High school	92	18
College graduate or University graduate	397	77.5
Employment status		
Unemployed	81	15.8
Employed in private sector	145	28.3
Employed in public sector	74	14.4
Student	102	19.9
Freelance	29	5.7
Retired but working	22	4.3
Retired	37	7.2
Other	23	4.5
Marital status		
Married	251	48.8
Single	233	45.3
Divorced	24	4.7
Other	6	1.2
Number of children		
0	268	52.4
1	84	16.4
2	124	24.3
3 or more	35	6.9
Socioeconomic status		
Low	20	4.7
Middle-Low	117	22.7
Middle	229	44.5
Middle-High	138	26.8
High	11	2.2

−0.163; t: −6.033, p = 0.001) and attachment anxiety (B: −0.008, SE: 0.002; 95% CI: −0.012, −0.003; t: −3.497, p = 0.001) were negative and significant. The first mediator, perceived social support, had a negative and significant effect on emotion dysregulation (B: −0.183, SE: 0.033; 95% CI: −0.248, −0.118; t: −5.542, p = 0.001), a positive and significant effect on anxious attachment (B: 0.012, SE: 0.002; 95% CI: 0.009, 0.016; t: 6.364, p = 0.001) and a negative and significant effect on depression (B: −0.040, SE: 0.010; 95% CI: −0.061, −0.020; t: −3.858, p = 0.001). These effects were significant because the p values were 0.001, and the CIs did not include zero (Fig. 1a).

The second mediator, emotion dysregulation, had a positive and significant effect on depression (B: 0.110, SE: 0.014; 95% CI: 0.083, 0.137; t: 7.918, p = 0.001) and a negative and significant effect on anxious attachment (B: −0.022, SE: 0.003; 95% CI: −0.027, −0.017; t: −8.839, p = 0.001). Finally, the third mediator, attachment anxiety, had a negative and significant effect on depression (B: −0.349, SE: 0.228; 95% CI: −0.797, 0.100; t: −1.528, p = 0.127). When the impact of COVID-19 and all the other mediating variables were added into the model at the same time, the effect of

Table 2. COVID-19-related characteristics

Variable	*n*	%
Change of living place		
Yes	50	9.8
No	462	90.2
Leaving family due to COVID-19		
Yes	57	11
No	459	89
Chronic disease		
No	417	81.4
Respiratory disease	16	3.5
Cardiovascular disease	23	5.1
Immune deficiency disease	10	2.2
Other	52	11.5
General health before COVID-19		
Very good	158	30.7
Good	309	60
Average	47	9.1
Bad	1	0.2
Very bad	0	0
Perceived risk of COVID-19		
Very low	87	16.9
Low	139	26.9
Average	228	44.2
High	51	9.9
Very high	11	2.1
Effects of COVID-19 on physical health		
Very low	77	15.1
Low	119	23.4
Average	166	32.6
High	110	21.6
Very high	37	7.3
Effects of COVID-19 on financial status		
None	116	22.5
Low	126	24.5
Average	134	26
High	103	20
Very high	36	7
Effects of COVID-19 on work life		
Unpaid leave	32	7.2
Paid leave	35	7.9
Working from home	150	33.9
Doing flexible hours/Part-time work	49	11.1
No change	176	39.8

Table 3. Minimum-Maximum (median), normal distribution and Cronbach's alpha values.

	Min-Max (median)	Skewness	Kurtosis	Cronbach's alpha
DASS-Depression	6–24 (12)	0.589	−0.649	*0.91*
DASS-Anxiety	7–28 (11)	1.103	0.520	*0.89*
DASS-Stress	7–28 (14)	0.519	−0.676	*0.91*
IES-R	22–110 (51)	0.440	−0.319	*0.92*
DERS-16	16–80 (37)	0.556	−0.399	*0.95*
MSPSS	12–84 (71)	−1.000	0.330	*0.93*
Attachment Anxiety	1.17–6.89 (4.72)	−0.446	0.134	*0.79*
Attachment Avoidance	1.00–6.33 (3.50)	0.492	2.269	*0.62*

DASS-Depression, Depression, Anxiety and Stress Scale, Depression scale; DASS-Anxiety, Depression, Anxiety and Stress Scale, Anxiety scale; DASS-Stress, Depression, Anxiety and Stress Scale, Stress scale; DERS-16, Difficulties in Emotion Regulation Scale; IES-R, Impact of Event Scale-Revised, a self-report instrument for symptoms of post-traumatic stress; MSPSS, Multidimensional Scale of Perceived Social Support.

the impact of COVID-19 on depression remained significant (c′ path) (B: 0.200, SE: 0.010; 95% CI: 0.181, 0.220; t: 20.249, p = 0.001) (Fig. 1a).

The total effect, indirect effect, and total indirect effect values were 0.123, 0.200, and 0.077, respectively. In terms of indirect effects, the effect of the impact of COVID-19 (X) on depression (Y) through perceived social support (M1; bootstrap = 0.010, 95% CI = 0.004, 0.017), emotion dysregulation (M2; bootstrap = 0.005, 95% CI = 0.003, 0.009), and attachment anxiety (M3; bootstrap = 0,001, 95% CI = 0.001, 0.003) was significant. The effect of the impact of COVID-19 on depression (Y) through perceived social support (M1) and emotion dysregulation (M2) (bootstrap = 0.001, 95% CI = −0.000, 0.001), and through perceived social support (M1) and attachment anxiety (M3) (bootstrap = 0.055, 95% CI = 0.038, 0.073) was also significant. However, the effects of the impact of COVID-19 on depression (Y) through emotion dysregulation (M2) and attachment anxiety (M3) (bootstrap = 0.004, 95% CI = −0.001, 0.010), and through perceived social support (M1), emotion dysregulation (M2) and attachment anxiety (M3) all together (bootstrap = 0.003, 95% CI = −0.001, 0.008) were not significant. Thus, perceived social support, emotion dysregulation, and attachment anxiety did not have serial mediation effects in the relationship between the impact of COVID-19 and depression (Fig. 1a).

In the second model, the effects of the impact of COVID-19 on stress (c path) (B: 0.147, SE: 0.012; 95% CI: 0.122, 0.171; t: 11.949, p = 0.001) and emotion dysregulation (B: 0.499, SE: 0.031; 95% CI: 0.438, 0.560; t: 16.038, p = 0.001) were positive and significant. On the other hand, the effects of the impact of COVID-19 on perceived support (B: −0.242, SE: 0.040; 95% CI: −0.321, −0.163; t: −6.033, p = 0.001) and attachment anxiety (B: −0.008, SE: 0.002; 95% CI: −0.012, −0.003; t: −3.497, p = 0.001) were negative and significant. The first mediator, perceived social support, had a negative and significant effect on the second mediator, emotion dysregulation (B: −0.183, SE: 0.033; 95% CI: −0.248, −0.118; t: −5.542, p = 0.001), a positive and significant effect on the third mediator, attachment anxiety (B: 0.012, SE: 0.002; 95% CI: 0.009, 0.016; t: 6.364, p = 0.001), and a negative and significant effect on stress (B: −0.025, SE: 0.011; 95% CI: −0.047, −0.003; t: −2.221, p = 0.027). These effects were significant because the p values were <0.05, and the CIs did not include zero (Fig. 1b).

The second mediator, emotion dysregulation, had a positive and significant effect on stress (B: 0.129, SE: 0.015; 95% CI: 0.099, 0.158; t: 8.559, p = 0.001), and a negative and significant effect on attachment anxiety (B: −0.022, SE: 0.003; 95% CI: −0.027, −0.017; t: −8.839, p = 0.001). The third mediator, attachment anxiety, did not have a significant effect on stress (B: −0.354, SE: 0.247; 95% CI: −0.839, 0.131; t: −1.435, p = 0.152). When the impact of COVID-19 was added into the model together with all the other mediating variables at the same time, the direct effect of the impact of COVID-19 on stress remained significant (c′ path)

Table 4. Pearson's product moment correlations for attachment anxiety, attachment avoidance, IES-R, DERS-16, MSPSS, DASS-Stress, DASS-Depression, and DASS-Anxiety (*N* = 517)

Variables	*M*	*SD*	1	2	3	4	5	6	7	8
(1) Attachment anxiety	4.64	0.87	–							
(2) Attachment Avoidance	3.56	0.65	0.00	–						
(3) DERS-16	39.79	15.60	−0.57**	0.08	–					
(4) MSPSS	66.05	16.54	0.41**	−0.37**	−0.34**	–				
(5) IES-R	53.24	17.56	−0.46**	0.03	0.61**	−0.26**	–			
(6) DASS-Stress	15.15	5.86	−0.48**	0.10*	0.66**	−0.32**	0.69**	–		
(7) DASS-Depression	12.68	5.28	−0.48**	0.12**	0.65**	−0.36**	0.67**	0.84**	–	
(8) DASS-Anxiety	12.27	5.32	−0.47**	0.07	0.60**	−0.29**	0.67**	0.81**	0.77**	–

**$p \leq 0.01$. DASS Depression, Depression, Anxiety and Stress Scale, Depression scale; DASS Anxiety, Depression, Anxiety and Stress Scale, Anxiety scale; DASS-Stress, Depression, Anxiety and Stress Scale, Stress scale; DERS-16, Difficulties in Emotion Regulation Scale; IES-R, Impact of Event Scale-Revised, a self-report instrument for symptoms of post-traumatic stress; MSPSS, Multidimensional Scale of Perceived Social Support.

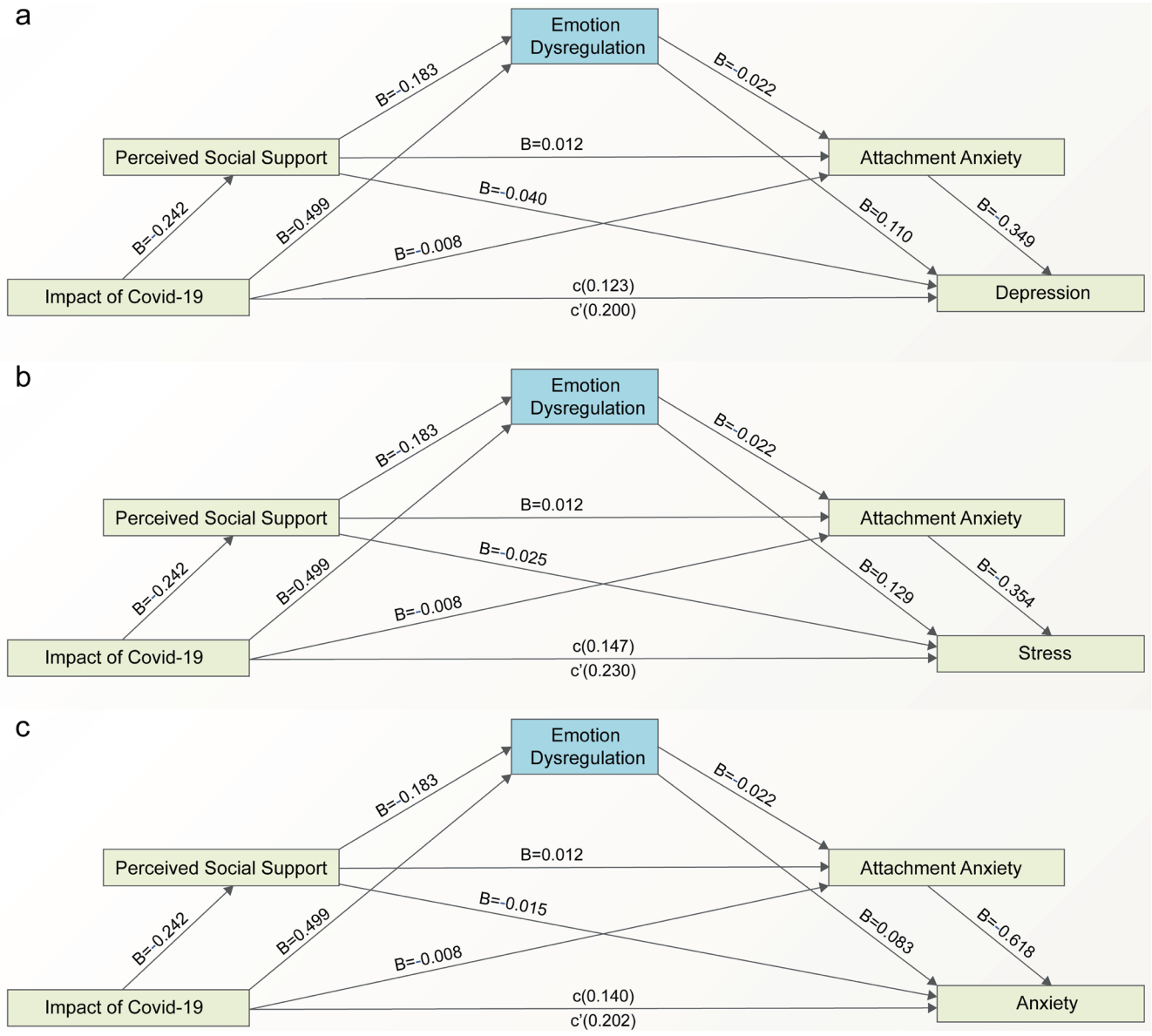

Fig. 1. Serial multiple mediation model for the impact of COVID-19. (a) perceived social support, emotion dysregulation, attachment anxiety, and depression; (b) perceived social support, emotion dysregulation, attachment anxiety, and stress; (c) perceived social support, emotion dysregulation, attachment anxiety, and anxiety.

(B: 0.230, SE: 0.011; 95% CI: 0.210, 0.251; t: 21.690, $p = 0.001$) (Fig. 1b).

The total effect, indirect effect, and total indirect effect values were 0.147, 0.230, and 0.084, respectively. In terms of indirect effects, the effect of the impact of COVID-19 (X) on stress (Y) through perceived social support (M1) (bootstrap = 0.006, 95% CI = 0.001, 0.013) and emotion dysregulation (M2) (bootstrap = 0.006, 95% CI = 0.003, 0.010) was significant. On the other hand, the effect of the impact of COVID-19 (X) on stress (Y) through attachment anxiety (M3) (bootstrap = 0.001, 95% CI = −0.001, 0.003) was not significant. The indirect effects of the impact of COVID-19 (X) on stress (Y) through perceived social support (M1) and emotion dysregulation (M2) (bootstrap = 0.001, 95% CI = −0.000, 0.001), and through perceived social support (M1) and attachment anxiety (M3) (bootstrap = 0.064, 95% CI = 0.045, 0.086) were significant. Contrary to these findings, the effects of the impact of COVID-19 (X) on stress (Y) through emotion dysregulation (M2) and attachment anxiety (M3) (bootstrap = 0.004, 95% CI = −0.003, 0.011), and through perceived social support (M1), emotion dysregulation (M2), and attachment anxiety (M3) (bootstrap = 0.003, 95% CI = −0.001, 0.009) were not significant. Thus, perceived social support, emotion dysregulation and attachment anxiety did not have serial mediation effects in the relationship between the impact of COVID-19 and stress (Fig. 1b).

In the third model, the effects of the impact of COVID-19 on anxiety (c path) (B: 0.140, SE: 0.012; 95% CI: 0.116, 0.163; t: 11.689, $p = 0.001$) and emotion dysregulation (B: 0.499, SE: 0.031; 95% CI: 0.438, 0.560; t: 16.038, $p = 0.001$) were positive

and significant. On the other hand, the effects of the impact of COVID-19 on perceived social support (B: −0.242, SE: 0.040; 95% CI: −0.321, −0.163; t: −6.033, p = 0.001) and attachment anxiety (B: −0.008, SE: 0.002; 95% CI: −0.012, −0.003; t: −3.497, p = 0.001) were negative and significant. The first mediator, perceived social support, had a negative and significant effect on the second mediator, emotion dysregulation (B: −0.183, SE: 0.033; 95% CI: −0.248, −0.118; t: −5.542, p = 0.001), and had a positive and significant effect on the third mediator, attachment anxiety (B: 0.012, SE: 0.002; 95% CI: 0.009, 0.016; t: 6.364, p = 0.001). On the other hand, the effect of perceived social support on anxiety was not significant (B: −0.015, SE: 0.011; 95% CI: −0.037, 0.006; t: −1.378, p = 0.169). These effects were significant because the p values were <0.05, and the CIs did not include zero. Furthermore, the reason for the non-significance was because the p values were >0.05, and the CIs included zero (Fig. 1c).

The second mediator, emotion dysregulation, had a positive and significant effect on anxiety (B: 0.083, SE: 0.015; 95% CI: 0.054, 0.112; t: 5.669, p = 0.001), and a negative and significant effect on attachment anxiety (B: −0.022, SE: 0.003; 95% CI: −0.027, −0.017; t: −8.839, p = 0.001). The third mediator, attachment anxiety, had a negative and significant effect on anxiety (B: −0.618, SE: 0.240; 95% CI: −1.091, −0.146; t: −2.572, p = 0.010). When the effect of the impact of COVID-19 and all the other mediating variables were added into the equation at the same time, the effect of the impact of COVID-19 on stress remained significant (c′ path) (B: 0.202, SE: 0.010; 95% CI: 0.183, 0.222; t: 20.389, p = 0.001) (Fig. 1c).

The total effect, indirect effect, and total indirect effect values were 0.140, 0.202, and 0.062, respectively. In terms of indirect effects, the effect of the impact of COVID-19 (x) on anxiety (Y) through perceived social support (M1; bootstrap = 0.004, 95% CI = −0.001, 0.010) was not significant. On the other hand, the effects of the impact of COVID-19 (X) on anxiety (Y) through emotion dysregulation (M2; bootstrap = 0.004, 95% CI = 0.002, 0.007), through attachment anxiety (M3; bootstrap = 0.002, 95% CI = 0.001, 0.004), through perceived social support (M1) and emotion dysregulation (M2) (bootstrap = 0.001, 95% CI = −0.000, 0.001), and through perceived social support (M1) and anxious attachment (M3) (bootstrap = 0.041, 95% CI = 0.025, 0.062) were significant. The effects of the impact of COVID-19 (X) on anxiety (Y) through emotion dysregulation (M2) and attachment anxiety (M3) (bootstrap = 0.007, 95% CI = −0.001, 0.015), and through perceived social support, emotion dysregulation, and attachment anxiety (bootstrap = 0.005, 95% CI = 0.001, 0.013) were also significant. Thus, there were serial mediating effects of perceived social support, emotion dysregulation, and attachment anxiety in the relationship between the impact of COVID-19 and anxiety (Fig. 1c).

Discussion

The present study examined the effects of emotion dysregulation, social support, and attachment style on stress, depression, anxiety, and PTSD symptoms in a sample of people living in Türkiye.

The correlational analyses revealed that as the emotion dysregulation increased, the levels of stress, depression, anxiety, and PTSD symptoms also increased. This finding is consistent with previous findings, indicating that emotional dysregulation moderates or is related to psychological problems in the general population, in contexts other than the COVID-19 pandemic, and in the context of the COVID-19 pandemic.[8–15] This suggests that difficulties in understanding, accepting, and managing emotions are significant for psychological problems in the context of COVID-19, similar to other traumatic events. Therefore, one target of psychological interventions that aim at the management of psychological problems may be emotional dysregulation.

The analyses also revealed that as attachment anxiety increased, the levels of psychological problems decreased. On the other hand, attachment avoidance was positively associated with stress and depression, but not with anxiety.

The finding that attachment avoidance is positively associated with stress and depression is consistent with previous findings, showing that attachment avoidance has a detrimental role in psychological well-being, in contexts other than the COVID-19 pandemic,[17–18] and in this context.[20] However, this finding is inconsistent with the finding of a study conducted in the context of the COVID-19 pandemic, which revealed that discomfort with the closeness dimension of avoidant attachment style is a protective factor.[2] These inconsistent findings may be due to the differences in the measurement instruments used across different studies to measure attachment avoidance. Nevertheless, consistent with the attachment theory, it can be concluded that in the context of the COVID-19 pandemic, attachment avoidance has a detrimental role in the development of psychological problems.

However, the finding that attachment anxiety is negatively associated with outcome measures is inconsistent with previous findings in the context of the COVID-19 pandemic, showing that anxious attachment is associated with higher levels of psychological problems.[2,20] These present findings suggest that in the context of the COVID-19 pandemic, attachment anxiety may be a protective factor against psychological problems. People became isolated and distant from any social interaction with their loved ones and felt lonely due to the COVID-19 pandemic.[43] In these circumstances, being able to relate and communicate with significant others may be protective.

Another study revealed a positive association between attachment anxiety, and accepting distress and seeking help for it.[44] Seeking help and social interaction in the context of the COVID-19 pandemic may be easier for people with an anxious attachment style, and getting social support can be protective. Indeed, the present findings revealed that as perceived social support increased, attachment anxiety increased, and as perceived social support increased, attachment avoidance decreased. Attachment anxiety can be characterized as seeking intimacy, but at the same time, fearing rejection and/or separation. Attachment avoidance can be characterized as avoiding intimacy. This finding is partially consistent with a previous finding in the context of COVID-19, indicating that attachment avoidance is associated with less support, while attachment anxiety does not predict the perception of social support.[31]

In the context of the COVID-19 pandemic, loss and separation appear to be the new normal. People became separated for various reasons, such as jobs or quarantine procedures. Therefore, attachment anxiety may have worked as a way of overcoming the uncertainty imposed by the pandemic in close relationships. That is, attachment anxiety fueled the people to focus on the 'here and now', and compensate for possible losses that may occur in the future. This finding suggests that attachment anxiety may have protected individuals from the detrimental effects of the COVID-19 pandemic, and can be considered one way of fostering post-traumatic growth.[45] Indeed, a study[46] conducted in the context of the COVID-19 pandemic revealed that a significant proportion of the general population experienced post-traumatic growth. Furthermore, evidence in the same context also suggested that fac-

tors, such as optimism, self-compassion, and COVID-19-related anxieties, are associated with post-traumatic growth.[47] Therefore, psychological interventions that aim at the management of psychological problems may focus on attachment anxiety. However, in view of the inconsistent findings in the literature, the effect of attachment anxiety on outcome measures needs to be investigated through future randomized-controlled studies that include multicultural samples, in order to better understand its mechanisms in the COVID-19 pandemic. Furthermore, future research needs to investigate the mechanisms or factors involved in post-traumatic growth in the context of the COVID-19 pandemic.

The correlational analyses also revealed that as perceived social support increased, the levels of psychological problems decreased. This finding is consistent with previous findings in COVID-19 circumstances similar to the present study, showing that individuals who reported higher perceived social support also reported lower depression.[15,29] During the social distancing times due to the COVID-19 pandemic, people may have felt lonely and become depressed.[43] Thus, perceiving social support from significant others can be protective. Furthermore, psychological interventions need to incorporate strategies, in which social support is activated in people's social environment.

The serial mediation analyses revealed that perceived social support, emotion dysregulation, and attachment anxiety did not have serial mediation effects in the relationship between the impact of COVID-19, and depression or stress. However, these effects were present in the relationship between the impact of COVID-19 and anxiety.

This contradictory finding points to the different conceptualizations of stress, anxiety, and depression, although these are related concepts. Stress refers to physiological reactions given to demands imposed by the environment, in which people live, and requires a process of adaptation to these demands.[48] That is, stress involves the relationship between people and the environment, in which people appraise environmental stimuli as exceeding their coping capacity.[49,50] Anxiety refers to a state of tension and apprehension that results from a perceived threat related to an uncertain situation, or a perceived adversity.[51] Anxiety commonly occurs with depression.[52] The experience of stress involves the presence of a specific stressor, and stress results from environmental demands. On the other hand, anxiety involves psychological processes (*i.e.*, appraisals). In the face of adverse events, long-lasting irrational appraisals can cause anxiety or depression.

The DASS-21 is based on the Tripartite Model.[32] This model includes three components: negative affect (mood), positive affect (mood), and hyperarousal and somatic tension. The negative affect includes the symptoms of stress. A negative affect is present in both depressive and anxiety disorders. Positive affect includes enthusiasm, excitement, and energy. In depressive disorders, the positive affect decreases. These two different types of mood determine whether psychological overstimulation will occur.[53] Hyperarousal and somatic tension are considered to be specific to anxiety.[53] The depression scale includes items that measure symptoms related to negative affects, such as sadness and despair, while the anxiety scale includes items that measure the increase in physical excitement, panic attacks, and symptoms of fear. The stress scale contains symptoms, such as tension, irritability, and increased reactivity to perceived stressful events.[54]

Considering these differences, it is not surprising that the serial mediating effects of perceived social support, emotion dysregulation, and attachment anxiety are only present in the relationship between the impact of COVID-19 and anxiety. In the present study, the data was collected between May and June 2020, at approximately three months after the outbreak of COVID-19 occurred in Türkiye. In the face of this event, people started to appraise its impact, and these appraisals were ultimately influenced by their perceived social support, ability to regulate emotions, and attachment styles. These appraisals may have led to stress or depression in the later stages of the outbreak. However, other factors could have mediated the relationship between the impact of COVID-19, and depression or stress, which were not examined in the present study. Indeed, in the context of the COVID-19 pandemic, a number of factors have been shown to be related to or to be risk factors for psychological problems, such as a history of childhood abuse or childhood adversity,[55,56] higher perceived risk of COVID-19 infection,[57] the personality trait of neuroticism,[14] higher self-stigma and lower personal control,[6] and decreased mindfulness and avoidant coping.[30] Future studies need to examine the role of these factors to better understand the relationship between the impact of COVID-19, and depression or stress.

Future directions

Overall, the present findings suggest that psychological interventions that aim at the management of psychological problems may focus on emotional dysregulation, attachment anxiety, and social support.

Future research needs to investigate the mechanisms or factors involved in post-traumatic growth in the context of the COVID-19 pandemic. Furthermore, future studies need to examine the role of a number of factors, such as a history of childhood abuse or childhood adversity, and personality traits, in order to better understand the relationship between the impact of COVID-19, and depression or stress.

Conclusions

The present study examined the effects of emotion dysregulation, social support, and attachment style on psychological problems in a sample of people living in Türkiye. The correlational analyses revealed that emotion dysregulation was related to psychological problems, suggesting that difficulties in understanding, accepting, and managing emotions are significant for psychological problems in the context of COVID-19. Furthermore, these analyses revealed that attachment anxiety was negatively related to psychological problems, while attachment avoidance was positively associated with stress and depression, but not with anxiety. These findings suggest that attachment avoidance has a detrimental role, while attachment anxiety has a protective role in psychological well-being during the COVID-19 pandemic. Indeed, attachment anxiety can be considered as one method of fostering post-traumatic growth. The correlational analysis revealed that perceived social support played a protective role during the COVID-19 pandemic.

The serial mediation analyses revealed that perceived social support, emotion dysregulation, and attachment anxiety did not have serial mediation effects in the relationship between the impact of COVID-19, and depression or stress. However, these effects were present in the relationship between the impact of COVID-19 and anxiety. This contradictory finding points to the different conceptualizations of stress, anxiety, and depression, although these are related concepts. Other factors could have mediated the relationship between the impact of COVID-19, and depression or stress.

Nevertheless, the present study had some limitations. First, the present study used the convenience sampling method. Second, the

sample consisted of highly educated, mostly female, and employed participants, who reported having a middle-to-high socioeconomic status. Third, most participants reported that they had good health and no history of chronic illness. Therefore, these limitations indicate that the present findings cannot be generalized to the general population of people living in Türkiye. Further studies with more even distribution of demographic characteristics need to be undertaken. Until then, these findings need to be interpreted with caution.

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Conflict of interest

The authors declare no conflict of interest.

Author contributions

MRKU contributed to the study's conceptualization, design and supervision, drafting and gradual revision of the manuscript, data collection, data interpretation, and review of the literature. MA and HBA contributed to the data collection, statistical analysis, review of the literature, and gradual revision of the manuscript. All authors approved the final version of the manuscript.

Ethics statement

All participants provided an informed consent prior to enrollment to the study. The study conformed to the ethical guidelines of the Helsinki Declaration and was approved by the Istinye University, Social and Human Sciences Research Ethics Committee. Ethics approval: dated 21 May 2020 (No.: 2020/06).

Data sharing statement

All data generated and analyzed in the study are available from the corresponding author upon request.

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