



# Coronavirus Anxiety and Psychological Adjustment in College Students: Exploring the Role of College Belongingness and Social Media Addiction

Gökmen Arslan<sup>1,2</sup> · Murat Yıldırım<sup>3,4</sup> · Masood Zangeneh<sup>5</sup>

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## Abstract

The psychological health of people all around the world is severely affected due to the COVID-19 outbreak. This study examined a moderated mediation model in which college belongingness mediated the relationship between coronavirus anxiety and psychological adjustment, and this mediation effect was moderated by social media addiction. A total of 315 undergraduate students ( $M = 21.65 \pm 3.68$  years and 67% females) participated in this study. The results demonstrated that college belongingness partially mediated the association between coronavirus anxiety and psychological adjustment. The mediating part from coronavirus anxiety to college belongingness was moderated by social media addiction. In comparison with the high level of social media addiction, coronavirus anxiety had a stronger predictive effect on college belongingness under the low and moderate levels of social media addiction condition. Our findings highlight that college belongingness is a potential mechanism explaining how coronavirus anxiety is related to psychological adjustment and that this relation may depend on the levels of social media addiction.

**Keywords** COVID-19 · Coronavirus anxiety · College belongingness · Psychological adjustment · Social media addiction · Turkish undergraduate students

The coronavirus disease 2019 (COVID-19) pandemic has adversely affected the Turkish population which was subjected to unprecedented physical and social distancing measures since the emergence of pandemic in Turkey. To prevent the spread of COVID-19, the Turkish

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✉ Gökmen Arslan  
garslan@mehmetakif.edu.tr

<sup>1</sup> Burdur Mehmet Akif Ersoy University, Burdur, Turkey

<sup>2</sup> International Network on Personal Meaning, Toronto, Ontario, Canada

<sup>3</sup> Ağrı İbrahim Çeçen University, Ağrı, Turkey

<sup>4</sup> University of Leicester, Leicester, UK

<sup>5</sup> Humber College, Toronto, Canada

government on April 20, 2020 implemented a partial lockdown covering the largest 30 cities alongside some small cities with high rates of confirmed cases of COVID-19 (Yıldırım and Arslan 2020). The lockdown includes restriction of movements within and across the cities, and all Turkish were encouraged and even required to stay home and withdrawn from social interactions with friends and relatives outside their household for different reasons except for necessities and urgencies. In addition, the travel restriction in and out of these cities was forbidden (Yıldırım and Arslan 2020). All schools and universities had to remain closed until April 30, 2020, continuing with online education (Republic of Turkey Ministry of National Education 2020). As of December 2, 2020, Turkey registered over 513,656 confirmed cases of COVID-19 and 14,129 deaths (Republic of Turkey Ministry of Health 2020).

## Coronavirus Pandemic and Psychological Adjustment

The COVID-19 pandemic is not only an epidemiologic crisis but also a health crisis by creating a wide range of psychological problems such as stress, anxiety, depression, trauma, panic, insomnia, death distress, anger, psychosis, boredom, and suicide (Ahorsu et al. 2020; American Psychological Association 2020; Burke and Arslan 2020; Liu et al. 2020; Yıldırım and Güler 2020). Examination of the impacts of COVID-19 pandemic on psychological health and well-being has been highly emphasized (Holmes et al. 2020). Anxiety related to the COVID-19 is one of the most commonly experienced distress during pandemic. Research suggest that people with high levels of coronavirus anxiety reported more coronavirus fear, functional impairment, worry about coronavirus, maladaptive religious coping, hopelessness, and suicidal ideation (Lee et al. 2020; Yıldırım et al. 2020).

A recent poll conducted in Germany asked people for symptoms of depression, anxiety, panic disorder, obsessive-compulsive disorder, and lockdown-related behavior (Munk et al. 2020). The results showed that in this novel coronavirus pandemic, more than half of the participants (50.6%) are facing at least one mental disorder, which is much higher than the usual prevalence of mental disorders. Investigation of psychological responses during the early stage of the COVID-19 outbreak on the general population in China demonstrated that 53.8% of participants reported the psychological impact of the outbreak as moderate to severe, while 16.5% rated moderate to severe depressive symptoms, and 28.8% rated moderate to severe anxiety symptoms (Wang et al. 2020). Another large-scale study with over 50,000 people in China during the pandemic found that nearly 35% of the participants suffer from psychological distress (Qiu et al. 2020).

Psychological adjustment refers to one's subjective sense of distress and the degree to which they function in daily life (Cruz et al. 2020; Peterson 2015). People with high levels of psychological adjustment tend to have a better ability to positively function in their daily lives (Yıldırım and Solmaz 2020). Research has shown that a higher positive psychological adjustment is associated with increased satisfaction with life and quality of life and decreased depression, anxiety, stress, and burnout (Bantjes and Kagee 2018; Chambers et al. 2017; Samios 2018; Yıldırım and Solmaz 2020). Given the profoundly high COVID-19 infection rate and relatively high mortality, people with higher coronavirus anxiety and stress may be at elevated risk for heightened psychological adjustment problems (Arslan et al. 2020b). Although limited, studies on previous pandemic have shown that coronavirus and SARS-related stressors have significant negative impacts on psychological adjustment (Arslan and Yıldırım 2021; August and Dapkewicz 2020; Main et al. 2011). In that study,

active coping and seeking social support were significantly positively associated with fewer psychological symptoms, higher perceived general health, and greater satisfaction with life, while avoidant coping was significantly positively associated with negative adjustment. While there is evidence of a relationship between higher anxiety and lower psychological adjustment within wider psychology (Carver et al. 2020; Luo et al. 2012), there has been relatively little investigation on the impact of coronavirus anxiety on psychological adjustment in Turkish context throughout the current pandemic. As such, the purpose of this study was to examine the impact of coronavirus anxiety on psychological adjustment and to explore the mediating and moderating role of college belongingness and social media addiction during COVID-19 outbreak.

After temporary school closure for the pandemic, 1.4 billion students worldwide have been impacted (UNESCO 2020). That closure physically disconnected students from their friends and their wider social network and appears to have a severe impact on their psychological health. This could have affected the sense of belongingness of students. School belongingness is defined as “the extent to which students feel personally accepted, respected, included, and supported by others in the school social environment” (Goodenow and Grady 1993, p. 61). It includes how youth feels about themselves as being important, valuable, and meaningful parts of their schools (Arslan and Duru 2017). The need-to-belong theory describes belongingness as a basic motivational need that is extremely important for developing and maintaining intimate, positive, and long-lasting relations with others (Baumeister 2012; Baumeister and Leary 1995). Sense of belongingness within school context is related to a wide range of critical adolescent school-based and quality of life outcomes (Arslan 2018a; Arslan, Allen, & Traci; 2020; Osterman 2000). For example, research showed that belongingness was related to better academic functioning, self-regulatory performance, greater well-being, and lower mental health symptoms (Arslan 2018b; DeWall et al. 2008; King et al. 1996). There is some initial data in a new study with college students linking low belongingness with lower levels of adaptability to the pandemic (Besser et al. 2020).

## College Belongingness and Social Media during the Pandemic

School is a productive environment where students can build a sense of belongingness. A fresh longitudinal cohort study in China indicated that the prevalence rates of mental health problems during the pandemic among students increased substantially when compared with those before the pandemic: depressive symptoms (24.9 vs 18.5%), non-suicidal self-injury (42.0 vs 31.8%), suicide ideation (29.7 vs 22.5%), suicide plan (14.6 vs 8.7%), and suicide attempt (6.4 vs 3.0%) (Zhang et al. 2020). This suggests that school is an important resource that supports youth mental health and well-being by giving the opportunities to improve a sense of belongingness. Therefore, separating students from school could have adverse effects on their sense of belongingness in school, which in turn leads to psychological adjustment problems. A sense of belongingness is also central to the school experience of college and university students, and deficits in belongingness are associated with poorer psychological adjustment (e.g., Ploskonka and Servaty-Seib 2015). There is some initial evidence linking a greater sense of belongingness on college students with better adaptability to the pandemic (see Besser et al. 2020). The current focus on levels of belongingness during the pandemic is in keeping with the potential usefulness of examining protective factors in specific situational contexts or circumstances and the heightened interpersonal sensitivities that are derived from

the greater social isolation experienced during the pandemic (for related discussions, see Casale and Fle 2020; Flett and Zangeneh 2020).

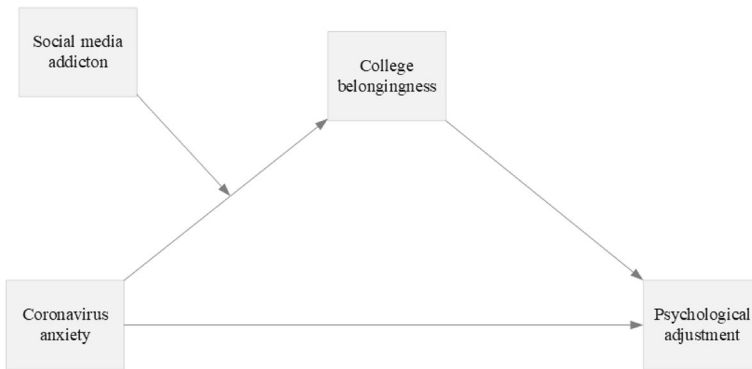
Social media usage is more common among young people who use social media for various reasons such as expressing identity and connecting with others (Mahmood et al. 2018). Handy, cheaper, and convenient Internet facilities and smartphone ownership are among the other factors enabling youth population to use social networking sites (Poushter 2016). It is hard to estimate the rates of social media usage because of the use of different measurement tools and the scarcity of a consensual conceptualization of problematic social media use (Bányai et al. 2017). While some research indicated a prevalence rate of 2.8% of social media use among university students (Olowu and Seri 2012), others presented a prevalence rate of 47% social media use among young people (Al Mamun and Griffiths 2019).

The usage of social media in times of health crisis like the current pandemic can be profoundly high. The easiness to access information and sharing this information to others and senses of social cohesion and social connectedness attract people to stay connected in social media. A handful of studies can be found in the literature on the use of social media in the context of pandemic. In a study conducted with 4624 Turkish public during the early stages of the COVID-19, people reported high levels of usage of social media ( $M = 2.73$ ,  $SD = .54$ ) and internet journalism ( $M = 2.74$ ,  $SD = .52$ ) on a scale of 1 to 3, with higher scores indicating higher levels of engagement in respective sources of information (Geçer et al. 2020).

In the extant literature, there are many studies investigating the association between social media usage and mental health problems. Studies have largely indicated that the prolonged social media usage is positively related with negative mental health outcomes such as anxiety, depression, and stress and negatively related with well-being over time (Bányai et al. 2017; Błachnio et al. 2016; Shakya and Christakis 2017). In a study with Turkish college students, Facebook addiction was significantly positively associated with severe depression, anxiety, and insomnia (Koc and Gulyagci 2013). In another study, social media use was found to be associated with sense of belongingness, online self-representation, and social support. Moreover, online self-presentation had a mediation effect on the influence of social media use on sense of belongingness and social support (Pang 2020). Similarly, social media usage was found to moderate the associations between skills of distinguish emotional facial expressions and social anxiety of college students (Ermiş and Kantarcı 2016). Given that people tend to excessively use social media as a source of information which can be both positive and negative, it is plausible to assume that high and low social media usages have different effects on college belongingness which can in turn influence psychological adjustment.

## The Present Study

Within the literature and theoretical framework sketched above, the present study proposed a moderated mediation model indicating that college belongingness mediated the relationship between coronavirus anxiety and psychological adjustment, and this mediation effect was moderated by social media addiction. Thus, we tested the following hypotheses ( $H_1$ ) to examine whether college belongingness mediated the associations between coronavirus anxiety and psychological adjustment and ( $H_2$ ) whether social media addiction moderated the mediating effect of college belongingness on the association between coronavirus anxiety and psychological adjustment, as shown in Fig. 1.



**Fig. 1** The proposed model indicating the association between the variables of the study

## Method

### Participants

The sample of the present study is composed of 315 undergraduate students attending a state university in an urban city of Turkey. Participants were primarily females (67%) and ranged in age between 18 and 39 years (Mean = 21.65, SD = 3.68 years). The sample included 37.8% first-year students, 26% second-year students, 16% third-year students, and 20% fourth-year students. Concerning the coronavirus characteristics, the majority of participants identified themselves as non-infected (87.9%). The administration of the study was done online. All participants were informed of their rights to opt out of the study at any time. Participation was voluntary and anonymous, and participants could withdrawal from the study at any time.

### Measures

**Coronavirus Anxiety** Coronavirus anxiety was assessed using the Coronavirus Anxiety Scale (CAS; Lee 2020), which is a 5-item self-report measure (e.g., “I felt dizzy, lightheaded, or faint, when I read or listened to news about the coronavirus”). The scale’s items are scored based on 5-point Likert-type scale, ranging from 0 = “not at all” to 4 = “nearly every day over the last 2 weeks” (Lee 2020). Arslan et al. (2020a) examined the psychometric properties of the CAS, indicating that the scale had a strong internal reliability estimate with Turkish university students. The internal reliability estimate of CAS with the present sample was strong, as seen in Table 1.

**Table 1** Descriptive statistics and correlation results

Variables	Mean	SD	Skewness	Kurtosis	$\alpha$	1.	2.	3.	4.
1. Coronavirus anxiety	2.51	3.85	1.82	2.81	.91	—	-.21**	.09	.24**
2. College belongingness	51.93	10.45	-.64	.23	.82	—	—	-.05	-.22**
3. Social media addiction	16.35	6.21	.19	-.73	.83	—	—	—	-.29**
4. Psychological adjustment	21.54	10.28	.26	-.99	.93	—	—	—	—

Note. \*\* $p < .001$

**College Belongingness** College belongingness was measured using the College Belongingness Questionnaire (CBQ; Arslan 2020a, b), which is a 10-item self-report measure (e.g., “I feel like I belong at this university”) developed to assess the feelings of belongingness of Turkish university students. All items of the measure are scored using a 7-point Likert-type scale, ranging between 1= “strongly disagree” and 7 = “strongly agree.” After reversing five social exclusion items, total sense of belongingness scores are provided by summing item responses. Results from the previous research indicated that the scale provided a strong internal reliability estimate with Turkish university students. The internal reliability estimate of CBQ in the present study was strong, as seen in Table 1.

**Social Media Addiction** Social media addiction was measured using the Bergen Social Media Addiction Scale (BSMAS; Andreassen et al. 2016). The scale includes six items rated on a 5-point Likert scale ranging from 1= “very rarely” to 5 = “very often.” A sample item is “How often during the last year have you tried to cut down on the use of social media without success?” A higher score on the BSMAS refers to stronger addiction to social media. Psychometric analyses of the BSMAS in Turkish were performed by Demirci (2019) who demonstrated good evidence of reliability and validity. The internal reliability estimate of BSMAS in this study was strong, as presented in Table 1.

**Psychological Adjustment** Students’ psychological adjustment was measured using the Brief Adjustment Scale-6 (BASE; Cruz et al. 2020), which is a 6-item self-report scale (e.g., “To what extent have you felt irritable, angry, and/or resentful this week?”) developed to assess psychological adjustment challenges of people. All items of the scale are scored based on a 7-point scale ranging from 1 = “not at all” to 7 = “extremely.” Higher scores are evaluated as a greater level of psychological maladjustment (Cruz et al. 2020). Yıldırım and Solmaz (2020) investigated the psychometric properties of the BASE for Turkish sample, revealing that the scale had strong internal reliability estimates. The internal reliability estimate of BASE with the present sample was strong, as shown in Table 1.

## Statistical Analyses

We performed a two-step analytic approach to examine the proposed model. Observed scale characteristics and correlation analysis were first conducted to explore descriptive statistics, the assumptions of analysis, and the associations between the study variables. Normality was interpreted using skewness and kurtosis scores and their cutoff points (D’Agostino et al. 1990; Kline 2015). Following the review of the observed scale characteristics and correlations, we then carried out a moderated mediation model using the PROCESS macro version 3.5 (Model 7; see Fig. 1) for SPSS (Hayes 2018). Moderated mediation is a statistical approach conducted to test conditional indirect effects, and moderation and mediation analyses are employed together in a single model (Preacher et al. 2007). Moreover, the bootstrap approach with 10,000 resamples to estimate the 95% confidence intervals was conducted for interpreting the significance of indirect effects (Hayes 2018; Preacher and Hayes 2008). All statistical analyses were performed using SPSS version 25.

## Results

### Observed Scale Characteristics

Findings from observed scale characteristics indicated that kurtosis scores were between  $-.99$  and  $2.81$ , and skewness values ranged from  $-.64$  to  $1.82$ , indicating that all measures had relatively normal distribution (D'Agostino et al. 1990; Kline 2015), as shown in Table 1. Further, correlation results revealed that coronavirus anxiety had significant correlations with college belongingness, and psychological adjustment had a non-significant association with social media addiction. College belongingness was also significantly correlated with psychological adjustment. The correlation between college belongingness and social media addiction was not significant. Social media addiction had a significant correlation with psychological adjustment, as seen in Table 1.

### Conditional Process Analysis

We next examined the mediating role of college belongingness on the relationship between coronavirus anxiety and psychological adjustment challenges and tested the moderating effect of social media addiction on the mediating role of college belongingness in this association using conditional process analysis (Model 7; see Fig. 1). Findings from this analysis showed that coronavirus anxiety was a significant predictor of college belongingness and psychological adjustment challenges. Social media addiction did not significantly predict college belongingness. Further, the interaction between coronavirus anxiety and social media addiction was significant, accounting for 5% variance in the association between coronavirus anxiety and college belongingness, as seen in Table 2. Social media addiction moderated this association, and the indirect effect of coronavirus anxiety on psychological adjustment challenges through college belongingness was observed when social media addiction was low ( $-1$  SD) and moderate when social media addiction was not high ( $+1$  SD), as shown in Fig. 2. Lastly, college belongingness had a significant predictive effect on college students' psychological adjustment and mediated the effect of coronavirus anxiety on psychological adjustment of college students.

## Discussion

The present study developed a moderated mediation model to investigate the mediation effect of college belongingness in the relationship between coronavirus anxiety and psychological adjustment and the moderating role of social media addiction in the association between coronavirus anxiety and college belongingness. The results mainly supported our research hypotheses. Findings from this study suggest that coronavirus anxiety significantly predicts college belongingness and psychological adjustment. Higher experience of coronavirus anxiety was associated with lower college belongingness and higher psychological adjustment problems. This suggests that college students who experience coronavirus anxiety are more likely to have poor school belongingness and difficulties with psychological adjustment compared with those who are not occupied with coronavirus anxiety. The results of this study are consistent with previous research demonstrating links between anxiety, college belongingness, and mental health outcomes. In a study conducted with college students, higher

**Table 2** Unstandardized coefficients for the conditional process model

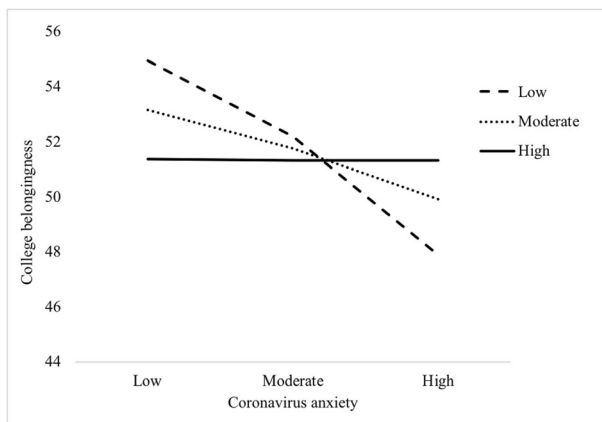
Antecedent		Consequent	
		M (college belongingness)	
	Coeff.	SE	t
X (coronavirus anxiety)	-.55	.15	-3.67
W (social media addiction)	-.07	.09	-.72
X×W	.09	.02	3.81
Constant	51.74	.58	90.22
$R^2 = .09$ ; $R^2$ change = .05; $F = 9.51$ ; $p < .001$			
Y (psychological adjustment)			
X (coronavirus anxiety)	.53	.15	3.52
M (college belongingness)	-.17	.06	-3.14
Constant	30.71	2.93	10.50
$R^2 = .09$ ; $F = 13.99$ ; $p < .001$			
Conditional indirect effects of coronavirus anxiety on psychological adjustment challenge			
College belongingness	Coeff.	BootSE	BootLLCI
M - 1SD (-6.23)	.19	.08	.05
M (.00)	.10	.04	.02
M + 1SD (6.23)	.00	.04	.09
Index of moderated mediation			
College belongingness	-.02	.01	-.03
			BootULCI
			.37
			.19
			.07
			-.01

SE standard error, *Coeff* unstandardized coefficient, X independent variable, M mediator variable, W moderator variable, Y outcomes or dependent variable



perceived stress was associated with lower satisfaction with life under the condition of low college belongingness (Çivıtcı 2015). Sense of belongingness was also associated with depression, interpersonal conflicts, and loneliness (Hagerty and Williams 1999) and social and academic adjustment (Arslan and Coşkun 2020; Ostrove and Long 2007) among college students. Previous studies also indicated elevated levels of mental health problems during the COVID-19 outbreak. For example, a study conducted in China with nearly 18,000 participants before and after the COVID-19 found that during the pandemic, negative emotions such as anxiety, depression, and anger increased, whereas positive emotions and life satisfaction decreased (Li et al. 2020).

The associations between college belongingness and psychological adjustment was also found in this study. Students with higher levels of college belongingness tend to have better adaptive psychological adjustment within school settings. Previous studies have demonstrated that college belongingness was positively associated with happiness and subjective well-being (McAdams and Bryant 1987) and negatively correlated with social exclusion and anxiety (Baumeister and Tice 1990) as well as depression, loneliness, and social anxiety (Leary 1990; Stebleton et al. 2014; Raymond and Sheppard 2018). This study employed college belongingness as an important mediator variable in the relationship between coronavirus stress and psychological adjustment. Consistent with our assumptions, the results of simple mediation model revealed that college belongingness partially mediated the relationship between coronavirus anxiety and psychological adjustment. This suggests that individuals who have low levels of coronavirus anxiety experience a greater sense of college belongingness, which in turn enhances psychological adjustment. Support for this explanation can be found in previous studies which showed that belongingness was an important mediator in explaining the relationship between school-related factors or other psychological variables (e.g., attachment insecurity) and mental health outcomes like depression and life satisfaction (Ahmadi and Ahmadi 2020; Venta et al. 2014). COVID-19-related stressors and associated lockdowns have significant adverse impacts on mental health outcomes. As presented in this study, college belongingness may be particularly salient in the process underlying psychological adjustment of students with coronavirus anxiety. The implications of these findings are important, highlighting the role of college belongingness involved in students with coronavirus anxiety and pointing to potentially modifiable mechanisms.



**Fig. 2** Moderating effect of social media addiction

Moreover, the current study provided evidence regarding the moderating role of social media addiction within the mediated path. Results from this study showed that the indirect effect of coronavirus anxiety on psychological adjustment via college belongingness only occurred when social media addiction was low and moderate. Unsurprisingly, the moderating effect of social media addiction did not occur when it was high. When they are highly engaged in social media, they may find an opportunity to meet their sense of belongingness with their peers in the virtual environment. These findings partially appear to contradict with previous examinations that students who highly engage in social media sites have poor academic performance in schools (Paul et al. 2012). This variation may be due to the notion that the college student may be aware of the negative impact of coronavirus anxiety on their senses of college belongingness when the intensity of using social media is limited.

## Implications and Limitations

The findings are important in terms of providing evidence that focus on prevention and intervention programs aimed at increasing students' sense of belongingness and psychological adjustment. Examination of key mediating and moderating mechanisms offer insights into potential intervention opportunities, which may be most beneficial in dealing with young adults at high risk of coronavirus. This study suggests that college belongingness may be a fundamental modifiable mechanism in order to prevent and to mitigate psychological adjustment problems in college students. For example, recent research suggests that school-based effective prevention and intervention programs in reducing social media addiction can promote positive mental health (including both emotional well-being and social functioning) in school context (Throuvala et al. 2019). Our findings suggest that working with young adults with high coronavirus anxiety may include the need for prudent assessment of college belongingness and levels of social media addiction to support the development of psychological adjustment. Therefore, considering the adverse mental health impacts of COVID-19 and associated lockdowns on psychosocial adjustment, it is indispensable that effective public health interventions in school context are designed to support college belongingness and promote psychological adjustment during and after the COVID-19 health crisis. Next, the results indicate that social media addiction moderates the association between coronavirus anxiety and college belongingness, which in turn influences student psychological adjustment. Decreasing social media addictive behavior could facilitate college students to deal with coronavirus anxiety and promote their feelings of belongingness, which in turn would improve their adaptive psychological adjustment. Given this effect, intervention strategies for social media addiction can be more effective if they focus on both the behavior and the risk factors (Arslan 2017), such as coronavirus anxiety. Cognitive-behavioral techniques could be useful for decreasing addictive behavior to social media. These strategies may contribute to modifying student thoughts, beliefs, and perceptions that can cause social media addiction (Arslan 2020a, b). Collectively, the findings from the present research demonstrate the complex interlink between risk and protective factors in college students' psychological adjustment and underscore the need for complex research design and methodology to better understand and promote optimal psychological health.

Limitations of the current study should be acknowledged. First, we did not collect any information about when the participants started to use the social media, and this might affect the associations between the coronavirus anxiety, college belongingness, and psychological adjustment. Second,

only Turkish undergraduate students were included, in a relatively small sample size, which could influence sample generalizability of the findings. A large sample of individuals from different countries, cultural backgrounds, and in different ages would be more useful to address the sample representativeness. Third, this study used the self-report method. Utilizing peer, parent, or teacher reports to evaluate the associations between the study variables would be useful to enhance the reliability, validity, and effectiveness of the findings of this study. Finally, we only adopted college belongingness as a mediator and social media addiction as a moderator. However, there might be other possible mediators, moderators, and relation models.

In conclusion, the results from the current study demonstrated that college belongingness mediated decreases in the negative impacts of coronavirus anxiety on psychological adjustment, while social media addiction moderated the association between the coronavirus anxiety and college belongingness. Generally speaking, the combinations of these two main findings mitigated the detrimental impacts of coronavirus anxiety on psychological adjustment during the emergence of COVID-19 among college students in Turkey.

## Compliance with ethical standards

**Ethics Approval and Consent to Participate** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Consent was obtained from all participants included in the study.

**Conflict of Interest** The authors declare that they have no conflict of interest.

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