

Loneliness, College Belongingness, Subjective Vitality, and Psychological Adjustment during Coronavirus Pandemic: Development of the College Belongingness Questionnaire

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Abstract

Loneliness is a serious risk factor for healthy development and flourishing. Although loneliness has been revealed to play an important role in psychological health and well-being, little is known about moderating and mitigating mechanisms underlying this association, especially during adverse experiences (e.g., COVID-19 pandemic). The current study purposed to explore whether subjective vitality mediated the association of loneliness with psychological adjustment and whether college belongingness moderated the mediating effect of subjective vitality on students' adjustment in the context of loneliness. The study sample comprised 333 undergraduate students (69% female) from a public university in Turkey. They ranged in age between 19 and 41 years ($M= 21.94$, $SD= 4.15$). Findings from mediation analysis revealed that loneliness had a significant predictive effect on subjective vitality and psychological adjustment challenges. Subjective vitality also mediated the effect of loneliness on the psychological adjustment of college students. Further, college belongingness moderated the mediating effect of subjective vitality on adjustment and had a protective effect on the association between loneliness and subjective vitality in college students. These results indicate that subjective vitality and college belongingness are important mechanisms that may help develop prevention and intervention strategies to foster students' psychological health and well-being in university settings.

Keywords: COVID-19, loneliness, subjective vitality, psychological adjustment, college belongingness, university students

Coronavirus disease (COVID-19) affects the lives of millions of people across the globe (Yıldırım & Güler, 2020a). Recent figures showed that as of October 11, 2020, globally, there had been more than 37 million confirmed cases of COVID-19 and more than one million deaths, touching 212 countries and territories (World Health Organization, 2020). Many people infected or confirmed with COVID-19 experience a wide range of psychosocial and behavioral problems, including but not limited to depression, anxiety, social dysfunction (Yıldırım & Arslan, 2020; Tanhan, 2020), stress (Arslan et al., 2020; Tanhan, 2020), fear (Yıldırım et al., 2020), higher COVID-19 related

severity and preventive behaviors (Yıldırım & Güler, 2020b), higher COVID-19 burnout (Yıldırım & Solmaz, 2020a), and higher loneliness and rumination (Arslan et al., 2020; Tanhan, 2020). During this public crisis, individuals with high feelings of loneliness report more maladaptive experiences (e.g., psychological adjustment challenges) and fewer adaptive outcomes (e.g., subjective vitality) related to the consequences of the pandemic. Such findings are alarming and need urgent investigations focusing on individuals' mental and psychological health during the pandemic.

Loneliness is a painful universal psychological

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experience that has serious consequences for college students' mental health and wellbeing (Moeller & Seehuus, 2019; Tanhan, 2020). Loneliness is identified as people's subjective perception of deficiencies in their social connections (Russell et al., 1984) and an absence of meaningful and positive relations with other people (Weiss, 1973). This unpleasant experience occurs when a personal loss of the quantity and quality of social relationships (Arslan et al., 2020). A recent study by Peltzer and Pengpid (2017) examined the loneliness of 17,886 university students from 25 countries, indicating that 11% of students reported mostly being lonely, and 13% reported much loneliness. Similarly, Özdemir and Tuncay (2008) investigated loneliness among college students from a state university in Turkey, reporting that 60% of young adults experienced loneliness. Tanhan (2020) conducted an innovative Online Photovoice (OPV) qualitative research with 127 college students in Turkey during COVID-19, and 26% of the students reported that being alone and/or not being able to come together with other people as the most crucial issue (barrier) in their life. This finding shows how socializing is crucial because the students were not provided with any pre-items regarding loneliness and/or any other items. Therefore, loneliness is one of the significant risk factors that might contribute to psychological ill-health problems and behavioral challenges in young adulthood (Arslan, 2020; Cacioppo et al., 2006; Moeller & Seehuus, 2019; Peltzer & Pengpid, 2017; Tanhan, 2020).

Several studies reported that loneliness negatively impacted psychological adjustment and well-being (Arslan, 2020; Houghton et al., 2016; Mellor et al., 2008; Tanhan, 2020). Among university students, loneliness was significantly found to be associate with anxiety and depressive symptoms (Kim et al., 2017; Moeller & Seehuus, 2019; Richardson et al., 2017; Tanhan, 2020), aggressive behaviors (Yavuzer et al., 2019), psychological well-being (Doman & Le Roux, 2012; Satıcı, 2019), and addictive behaviors (Habibi et al., 2018; Skues et al., 2016). Further, some research investigated the association between loneliness and a variety of outcomes during the coronavirus pandemic. For example, Li and Wang (2020) showed that over one-third of British people reported loneliness sometimes or frequently during the pandemic and found young people at higher risk of experiencing feelings of loneliness and psychological disorders such as depression, somatic disorders. When compared to the pre-pandemic period, Killgore et al. (2020) reported increased levels of loneliness among American adults

during the pandemic. They found significant positive associations between loneliness, depression, and suicidal ideation, suggesting that loneliness is a paramount health concern to cope with the pandemic effectively. College students in Turkey also reported missing their friends and social activities during the pandemic. Students reported that loneliness had adverse bio-psycho-social, spiritual, and economic impacts, in part because they used maladaptive coping strategies (Tanhan, 2020). Given the impacts of loneliness on psychological health and well-being before and during the pandemic, it is critical to understand mechanisms that may help develop prevention strategies to promote psychological adjustment and well-being in college students. The purpose of the current study is to examine whether subjective vitality mediates the association of loneliness with psychological adjustment and whether college belongingness moderates the mediating effect of subjective vitality on student adjustment in the context of loneliness.

Mediating Effect of Subjective Vitality

Subjective vitality, an increasingly prominent dynamic concept in positive psychology, refers to individuals' conscious experience of feeling alive and having energy (Ryan & Frederick, 1997). Subjective vitality is physical and mental energy that originates from self-direction, support, autonomy, and intrinsic motivation; this energy represents a powerful resource that helps individuals regulate purposive actions (Ryan & Deci, 2008; Ryan & Frederick, 1997). People who have high subjective vitality report being more active and productive, having better coping with challenges, and having more robust psychological health and well-being (Kawabata et al., 2017; Ryan & Deci, 2008; Uğur et al., 2019). Within the self-determination perspective (self-determination theory; Deci & Ryan, 2000; Ryan & Deci, 2008), psychological energy is an essential resource for subjective vitality necessary to make activities, and a high level of vitality facilitates better psychological health and flourishing. Therefore, subjective vitality has a positive effect on the regulation of purposive behaviors and actions which enhances psychological health and well-being (Arslan et al., 2020). Additional research has suggested the significant and negative predictive impact of loneliness on college students' subjective vitality (Satıcı, 2020). Young adults with healthy social relationships reported greater subjective vitality (Akin et al., 2016; Tanhan, 2020). Vitality mediated the association between

friendship quality and subjective happiness in college students (Akin & Akin, 2015). Given the theoretical framework and empirical evidence, lonely people are more likely to report fewer aliveness and energy experiences.

Previous research also indicated that subjective vitality was associated with a variety of psychological adjustment indicators: Subjective vitality significantly correlated with subjective well-being (Jackson & DiPlacido, 2020; Salama-Younes & Hashim, 2018), addictive behaviors (Niemic et al., 2010), psychological distress (Rouse et al., 2015), flourishing (Salama-Younes, 2011), school burnout (Saricam, 2015), and subjective happiness (Uğur et al., 2019). For Turkish college students, Arslan et al. (2020) found that subjective vitality mitigated the negative effects of coronavirus anxiety on ruminative thoughts. Similarly, internet addiction was a significant predictive of subjective happiness through subjective vitality (Akin, 2012). Another study by Uysal et al. (2013) revealed that subjective vitality, directly and indirectly, predicted subjective happiness, and Facebook addiction mediated the association between vitality and happiness in Turkish university students. Moreover, subjective vitality was positively correlated with physical function and health-related quality of life and was negatively associated with depression, anxiety, and feelings of fatigue (Rouse et al., 2015). Although evidence is minimal, these results indicate that subjective vitality might be associated with students' psychological adjustment. Hence, we suggest that the underlying pathway from loneliness to psychological adjustment is through subjective vitality.

Moderating Effect of College Belongingness

The need for belonging is theoretically identified as a basic psychological need (Bowlby, 1969; Epstein, 1992; Glasser, 1986; Maslow, 1971) and is an essential human motivator, considering that all people are innately driven to find a sense of belongingness and sustain it (Baumeister & Leary, 1995). School settings especially provide unique multisystemic opportunities for youths and young adults to bond (Allen et al., 2016; Arslan et al., 2020). Within the school context, the need for belonging, namely school belongingness, is a fundamental construct for the better psychological flourishing of young people (Arslan, 2020; Arslan & Tanhan, 2019). School belonging is often defined as students' subjective feelings of being respected, accepted, included, and supported by other people in the school's social environment (Goodenow, 1993; Goodenow & Grady, 1993). Arslan and Duru (2017)

emphasize that school belonging is students' subjective perceptions of themselves as a relevant, meaningful, and valuable part of the school. Students with a high sense of school belonging exhibited fewer psychological adjustment challenges, such as depression, anxiety (Arslan, 2019; Arslan et al., 2020; Arslan & Tanhan, 2019; Davis et al., 2019) and behavioral problems, including suicidal behaviors, conduct problems (Arslan, 2019; Arslan & Tanhan, 2019; Olcoń et al., 2017; Rostovsky et al., 2003).

Although a growing number of studies suggest the importance of school belongingness for psychological health and flourishing (see Arslan & Duru, 2017 for a brief review), few have included college students, especially in Turkey. Researchers have often been interested in elementary and high school students. However, research focusing on a sense of belonging within the college context is crucial. Young adulthood is a time of significant career and social changes and a life stage when psychological health challenges and low flourishing can arise. For instance, Alkan (2016) investigated Psychological Sense of School Membership Scale (Goodenow, 1993) for Turkish university students and found that the scale yielded a three-factor solution (i.e., acceptance by faculty members, acceptance by students, and belonging). It also had significant correlations with loneliness, intention to dropout, satisfaction with the university, and self-report sense of belonging. College students with a high sense of belonging also reported more effective adaptive help-seeking strategies (Won et al., 2019), fewer psychological difficulties (Pittman & Richmond, 2007; Thompson et al., 2019) and loneliness (Mounts, 2004), and higher affective well-being (Çivitci, 2014). Further, several studies showed that belongingness was an essential protective factor on students' psychological health and adjustment in the context of stressors or adversities (Backhaus et al., 2019; Civitci, 2015; Eisenberg et al., 2007; Nuttman-Shwartz, 2019; Zhang et al., 2020). A study by Baskin et al. (2010) reported that school belongingness had a moderating effect on the relationship between loneliness and depressive symptoms and served as a vital protective mechanism on psychological health in the context of adverse experiences (Zhang et al., 2020). Like the literature involving elementary and high school students, research suggests that college belongingness can be a powerful resource to foster college students' robust psychological health and well-being and serve as a protective mechanism in the face of loneliness experience.

Purpose of This Study

Within the empirical and theoretical evidence sketched above, the purpose of the present study is to examine the mediating effect of subjective vitality on loneliness's association with psychological adjustment. This study further examines whether college belongingness moderates the mediating effect of subjective vitality on students' adjustment in the context of loneliness see Figure 1. Although loneliness is a serious risk factor for healthy development and flourishing, little is known about moderating and mitigating mechanisms that can help cope with the harmful effects of its psychological health and well-being. This relationship is particularly evident within the context of the current COVID-19 pandemic. Therefore, a critical step is understanding protective and promotive factors that may help develop prevention intervention strategies to improve college students' adjustment and well-being. In the present study, we initially investigated the College Belonging Questionnaire (CBQ) validity to measure the sense of belongingness among college students. We hypothesized that subjective vitality would mitigate the association of loneliness with psychological well-being, and college belongingness would moderate the mediating effect of subjective vitality in this relationship and serve as a protective factor on subjective vitality in the context of loneliness among

college students.

Method

Participants

Participants comprised 333 undergraduate students (69% female) from a state university in a Turkish urban city. Students in the study ranged between 19 and 41 years ($M = 21.94$, $SD = 4.11$). With regards to educational level, the majority of participants were first-year students (39%), following by second-year students (25%), fourth-year students (19%), and third-year students (17%). Regarding the coronavirus characteristics, most participants were not infected (88%), and approximately 60% of students reported themselves at medium-risk for COVID-19 (high-risk for COVID-19 = 8% and low-risk for COVID-19 = 32%). Moreover, approximately 41% of participants were under 20 years old and were on stay-at-home orders because of COVID-19 restrictions.

A web-based survey was employed, and participants were contacted via social media. The study announcement described it as focusing on how subjectivity vitality and college belonging are related to loneliness and psychological well-being. Participants interested in the study were directed to the survey. The survey began with informed consent and continued to the survey items. The participants completed the survey anonymously, and participation was voluntary.

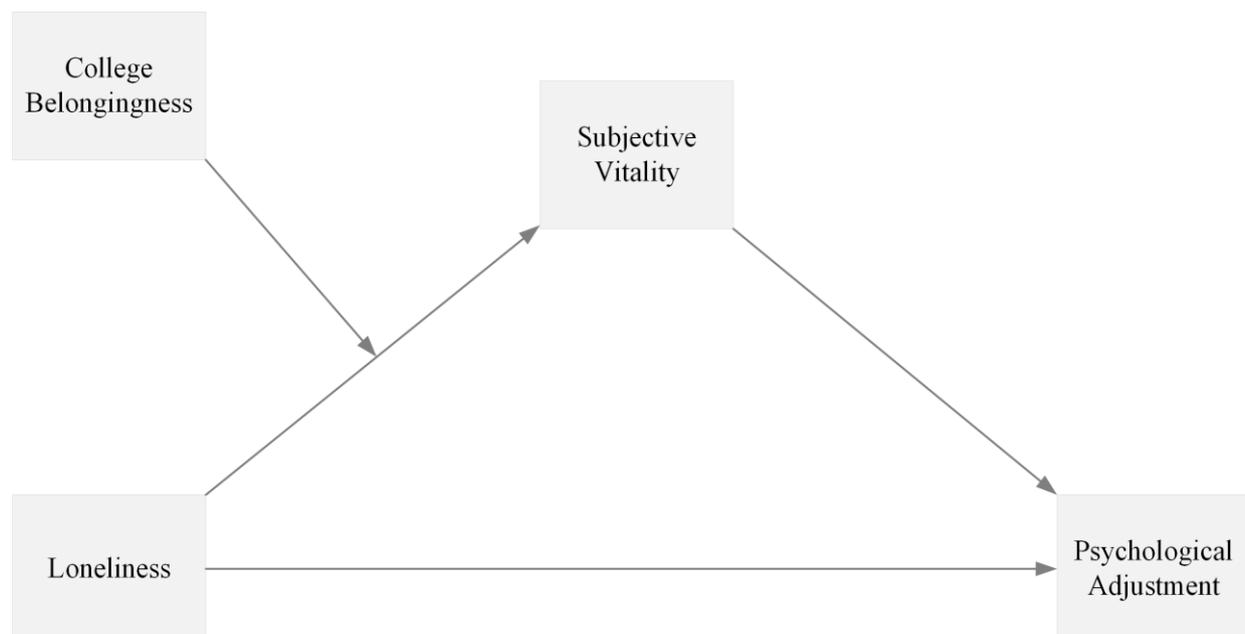


Figure 1. Proposed model indicating the association between the variables of the study

Measures

College Belongingness Questionnaire (CBQ).

The CBQ was developed for the present study. The CBQ item pool was created using a similar process to those Arslan and Duru (2017) performed in developing the School Belongingness Scale (SBS) and was reported by recommendations from research on scale development and validation (e.g., Tay & Jebb, 2017; Worthington & Whittaker, 2006). Items were produced to reflect the hypothesized belongingness dimensions “social acceptance or inclusion” and “social exclusion” as they are reported in the literature (e.g., Arslan & Duru, 2017; Baumeister & Leary, 1995; Malone et al., 2012). After reviewing the literature and theoretical framework (see Arslan & Duru, 2017, for a brief review), six pilot items for each construct were generated to identify these themes’ core characteristics. Following items drafting, a group of five experts, who were tenured associate professors and professors in the fields of counseling psychology in Turkey, independently reviewed the CBQ item pool in terms of clarity, conciseness, and developmental appropriateness. Based on their recommendations, several minor changes were provided on three items to increase clarity. The final item pool was comprised of 12 items, rating on a 7-point Likert-type scale, ranging from *strongly disagree* (1) to *strongly agree* (7). After reversing negative items of the measure (i.e., social exclusion items), overall belongingness scores are created by summing item responses. Higher scores are interpreted as a greater level of college belongingness.

UCLA Loneliness Scale (UCLA-8). The UCLA Loneliness Scale (Russell et al., 1980) was used to assess participants’ loneliness feelings. The scale is an 8-item self-report measure (e.g., “I am unhappy doing so many things alone”). All items use a 4-point response scale (from 1 = *never* to 4 = *often*). Doğan et al. (2011) examined the scale’s psychometric properties with the Turkish college sample, indicating that the measure had an adequate internal reliability coefficient ($\alpha = .72$). The internal reliability estimate with the present sample was strong (see Table 2).

Subjective Vitality Scale (SVS). The SVS is a 7-item self-report scale (e.g., “I nearly always feel awake and alert.”) used to measure college students’ subjective vitality of (Ryan & Frederick, 1997). All items are scored using a 7-point Likert-type scale ranging from 1 = *not at all true* to 7 = *very true*. Uysal et al. (2014) investigated the Turkish version of the scale with college students, demonstrating that the scale had adequate-strong internal and test-retest reliability

estimates ($\alpha = .84$, test-retest = $.74$). The scale had a strong internal reliability estimate with the sample of the study (see Table 2).

Brief Adjustment Scale-6 (BASE). Students’ psychological adjustment was assessed using the BASE, a 6-item self-report instrument (e.g., “To what extent have you felt tense, anxious, and/or afraid this week?”), scored using a 7-point scale ranging from 1 = *not at all* to 5 = *extremely* (Cruz et al., 2020). Yıldırım & Solmaz (2020b) examined the psychometric properties of the Turkish version of the scale, showing that the measure had a strong internal reliability estimate ($\alpha = .88$). The internal reliability estimate with the present sample was strong (see Table 2).

Statistical Analysis

We first the College Belongingness Questionnaire (CBQ) using exploratory and confirmatory factor analysis. The sample of the study was randomly divided into two subsamples (about 50%). Exploratory factor analysis was carried out to identify the factor structure of the measure using the first sample. Results from the factor analysis were interpreted using cross-loading ($\geq .30$), factor loading ($\geq .32$), and theoretical interpretability (Field, 2009; Stevens, 2009). Next, confirmatory factor analysis was conducted to test the second-order measurement model with the second sample. Model fit statistics and their cut points were also used to evaluate the measurement model: CFI and TLI score $.90 \leq$ = adequate fit; RMSEA and SRMR values $\leq .10$ = adequate fit (Hooper et al., 2008; Hu & Bentler, 1999). We performed descriptive statistics. Analysis assumptions were examined and score skewness and kurtosis were interpreted for normality assumption (D’Agostino et al., 1990; Field, 2009). Moreover, the internal reliability estimates of the measure were examined with the sample of the present study. After reviewing these preliminary analyses, we employed a moderated mediation model using the PROCESS macro (Model 7) for SPSS version 3.5 (Hayes, 2018). Moderated mediation is a statistical approach performed to examine conditional indirect effects, and the moderation and mediation analysis are used together in the same model (Preacher et al., 2007). Given the bootstrap approach’s advantages, the bootstrap approach with 10,000 resamples to estimate the 95% confidence intervals were performed to evaluate the significance of indirect effects (Hayes, 2018; Preacher & Hayes, 2008). All analyses were employed using AMOS version 24 and SPSS version 25.

Table 1. Scale Items, belonging domains, and factor loadings

Items	EFA		CFA			
	SA S	SES	λ_1	ℓ^2_1	λ_2	ℓ^2_2
Social Acceptance Scale	—	—	—	—	.49	.24
I feel like I belong to this university.	.88	.04	.92	.84	—	—
I feel like myself as a real part of this university.	.85	-.05	.94	.88	—	—
I can really be myself at this university.	.84	.01	.62	.39	—	—
Overall, I feel happy to be at this university.	.73	.20	.70	.48	—	—
I think that people at this university care about me.	.70	-.16	.69	.48	—	—
Social Exclusion Scale	—	—	—	—	.73	.54
My friends generally ignore me at this university.	-.07	.78	.76	.58	—	—
My friends do not involve me in their plans.	.04	.62	.67	.45	—	—
I don't have close bonds with members of this university.	.03	.50	.56	.31	—	—
I feel isolated from the rest of the world at this university.	.16	.45	.46	.21	—	—
I feel myself excluded at this university.	-.09	.39	.64	.41	—	—
Overall College Belongingness Scale	—	—	—	—	—	—

Note. EFA = exploratory factor analyses; CFA = confirmatory factor analysis. λ_1 = item loadings for first-order factors; ℓ^2_1 = indicator reliability for first-order factor items; λ_2 = first-order factor loading for second-order factor; ℓ^2_2 = indicator reliability for second-order factor indicators

Results

CBQ Latent Structure

Findings from descriptive statistics indicated that several pilot items of the CBQ had relatively non-normal distribution (skewness and kurtosis values > |3|), and exploratory factor analysis was performed using the principal axis factoring method with a Promax rotation. The first analysis indicated a two-factor solution with eigenvalues > 1.0. It accounted for 46% of the variance, characterized by an adequate sample size (Kaiser-Meyer-Olkin test of sampling adequacy = .82) and a lack of singularity (Bartlett's $\chi^2 = 990.27$, $df = 66$, $p < .001$). Visual inspection of the scree plot, eigenvalues (scores > 1.0), and parallel analysis suggested a two-factor solution yielded a better fit to the data; therefore, no other solutions were examined. After excluding non-loading and cross-loading items,

the factor analysis was rerun. Findings from this analysis revealed the two-factor solution, which comprised of 10 items explained 49% of the variance, with eigenvalues of 4.01 and 1.82. All factor loadings on two factors had scores exceeding .32 and ranged from adequate to strong, with no cross-loadings, as shown in Table 1.

After exploring the measure's factor structure, confirmatory factor analysis was carried out to affirm the measurement model. Findings from the factor analysis provided adequate data-model fit statistics to the two-factor measurement model with 10 items that were indicators of two first-order structures (i.e., social exclusion and social acceptance), $\chi^2 = 81.59$, $df = 34$, $p < .001$, CFI = .94, TLI = .92, RMSEA (95% CI) = .088 (.063, .11). The scales had adequate-to-strong factor loadings, ranging from .46 to .94, as shown in Table 1.

Table 2. Descriptive statistics and correlation results

Variables	Mean	SD	Skewness	Kurtosis	α	1.	2.	3.	4.
1. Loneliness	14.51	4.68	.79	.17	.79	—	-.40	-.54	.34
2. Subjective vitality	27.27	9.93	.27	-.82	.89	—	—	.43	-.35
3. College belongingness	46.64	9.09	-.66	.45	.81	—	—	—	-.29
4. Psychological adjustment	21.45	10.27	.32	-.94	.93	—	—	—	—

Note. All correlations were significant ($p < .001$)

Reliability analysis also showed that the CBQ had adequate-strong internal reliability estimates with total sample (CBQ $\alpha = .81$, SES $\alpha = .71$, SAS $\alpha = .89$). These results provide initial evidence suggesting that the CBQ is psychometrically reliable and valid for assessing Turkish students' college belongingness.

Descriptive Statistics

Findings from descriptive statistics revealed that skewness scores were between $-.66$ and $.79$, and kurtosis values ranged from $-.94$ to $.45$, suggesting that all variables in the study were relatively normally distributed (D'Agostino et al., 1990; Field, 2009). Correlation results also showed that loneliness had significant and negative correlations with subjective vitality and college belonging. There is a significant and positive correlation between subjective vitality and college belonging. Psychological adjustment was significantly and negatively associated with subjective vitality and college belonging, as shown in Table 2. Lastly, we examined the study variables' internal reliability estimates, indicating that all measures had strong internal reliability estimates, ranging from $.79$ to $.93$, respectively.

Conditional Process Analysis

We aimed to examine whether subjective vitality mitigated the association between loneliness and psychological adjustment and whether college belongingness moderated the mediating effect of subjective vitality on this relationship. Findings from conditional process analysis revealed that loneliness significantly and negatively predicted subjective vitality ($b = -.61$, $t = -4.84$, $p < .001$), whereas college belongingness was a significant and positive predictor of subjective vitality ($b = .36$, $t = 5.59$, $p < .001$). The interaction effect between loneliness and college belonging on subjective vitality was significant ($b = -.03$, $t = -3.23$, $p = .001$; R^2 change = $.03$). The model accounted for 25% of the variance in subjective vitality significantly, as seen in Table 3. The simple slope effect, moreover, showed that the indirect effect of loneliness on psychological adjustment through subjective vitality was observed when college belongingness was high ($+1 SD$), moderate, and low ($-1 SD$), as shown in Figure 2.

Table 3. Unstandardized coefficients for the conditional process model

Antecedent	Consequent			
	Coeff.	SE	t	p
<i>M</i> (Subjective vitality)				
X (Loneliness)	-.61	.12	-4.84	<.001
W(College belongingness)	.36	.06	5.59	<.001
X×W	-.03	.01	-3.23	.001
Constant	26.40	.54	48.63	<.001
$R^2 = .25$; R^2 change = $.03$ $F = 35.37$; $p < .001$				
<i>Y</i> (Psychological adjustment)				
X (Loneliness)	.54	.12	4.43	<.001
<i>M</i> (Subjective vitality)	-.24	.06	-4.19	<.001
Constant	28.31	1.68	16.86	<.001
$R^2 = .17$ $F = 31.44$; $p < .001$				
Conditional indirect effects of loneliness on psychological adjustment				
College belongingness	Coeff.	BootSE	BootLLCI	BootULCI
<i>M</i> - 1SD (-9.10)	.07	.04	.01	.16
<i>M</i> (.00)	.15	.05	.07	.26
<i>M</i> + 1SD (9.10)	.22	.07	.01	.38
Index of moderated mediation				
College belongingness	.01	.01	.01	.02

Note. SE = standard error. Coeff = unstandardized coefficient. X = independent variable; M = mediator variable; W = moderator variable; Y = outcomes or dependent variable

We further tested the mediating effect of subjective vitality on the association between college students' loneliness and psychological adjustment. Results from mediation analysis showed that psychological adjustment was significantly and negatively predicted by subjective vitality ($b = -.24, t = -4.19, p < .001$), and loneliness also had a significant predictive effect on psychological adjustment ($b = .54, t = 4.43, p < .001$). Loneliness and subjective vitality together explained 17% of the variance in psychological adjustment. These results suggest that loneliness significantly predicted psychological adjustment through subjective vitality, and subjective vitality mitigates the negative effect of loneliness on adjustment of college students, as seen in Table 3.

Discussion

Coronavirus disease is a global health crisis impacting people's daily lives and health all over the world. The pandemic is related to a wide range of psychological, social, and behavioral consequences such as feelings of loneliness (Killgore et al., 2020; Li & Wang, 2020; Tanhan, 2020). Hence, there is a crucial need to understand the protective and mitigating factors to develop effective prevention and intervention strategies for promoting people's mental health and well-being in the context of the coronavirus pandemic's experiences. The present study examined whether subjective vitality mediated the association of loneliness with psychological well-being and whether college belongingness moderated the mediating effect of subjective vitality on students' well-being in the context of loneliness. Before testing the moderated mediation model, we explored the initial development and validation of a self-report measure, the College Belongingness Questionnaire (CBQ), for college students in Turkey, which may help assess the sense of belonging of students in university settings. Findings from factor analysis revealed a two-factor solution, which included 10 items that explained 49% of the variance. The item loadings on two factors exceeding .32 and ranged from adequate to strong. After exploring the factor structure of the measure, confirmatory factor analysis provided adequate data-model fit statistics to the two-factor measurement model with 10 items that were indicators of two latent constructs (i.e., social exclusion and social acceptance). All items of the scale had adequate-to-strong factor loadings, ranging from .46 to .94, and the CBQ had adequate-strong internal reliability estimates. These results provide initial evidence supporting the CBQ's reliability and validity

for assessing Turkish students' sense of college belongingness in university settings.

Findings from the study next indicated that loneliness significantly predicted subjective vitality and psychological well-being of college students. Higher feelings of loneliness were associated with less subjective vitality and more psychological adjustment challenges. These results suggest that lonely young adults are more likely to have lower subjective vitality and psychological well-being than nonlonely young adults. With the spread of coronavirus, most countries issued varying stay-at-home orders mandating that nonessential businesses and schools close. Although these measures are critical to decreasing the infection rate, people are more likely to experience feelings of loneliness because of limiting social interactions, contacts, or activities (Luchetti et al., 2020). For example, at the beginning of the pandemic, young people under 20 years had mandated stay-at-home orders because of Turkey's COVID-19 restrictions, which may have limited social activities and interactions. Thus, young people may thus be at higher risk for increases in feelings of loneliness due to the restriction measures. Results from this study are consistent with these findings provided from the context of the COVID-19 pandemic. Arslan and Yıldırım (2020) demonstrated that subjective vitality and loneliness could be important mediators between coronavirus anxiety and loneliness among college students. Tanhan (2020), in an online photovoice (OPV) study, found that 18% of the Turkish college students reported having social connections with other people and especially family, friends, and peers as the most important facilitator for themselves during the pandemic. In the same study, 26% of the participants reported having no social connections and support as the most important barrier (issue, problem) during the pandemic.

Social interactions with others influence one's thoughts, behaviors, and feelings which enhance positive experiences (e.g., subjective vitality) and psychological well-being. However, feelings of loneliness result from both a lack of intimate, meaningful relatedness to another individual (emotional loneliness) and insufficient social relationships. The person is part of a group of individuals who share similar interests and activities (Russell et al., 1984). Given the COVID-19 restrictions in Turkey, college students are more likely to experience greater loneliness because of insufficient social interactions with others.

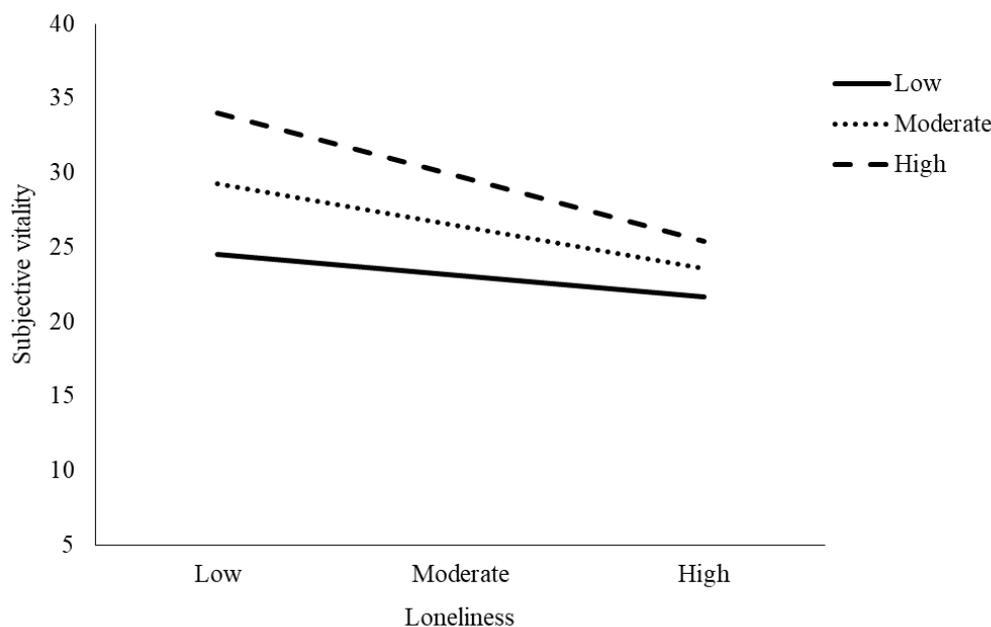


Figure 2. Moderating effect of college belonging

Lonely young adults may thus experience fewer subjective vitality and more significant psychological adjustment challenges than those who are non-lonely. Consistent with this study's results, past research revealed that loneliness had impairment impacts on psychological well-being and adjustment. Feelings of loneliness were, for instance, associated with depressive symptoms (Kim et al., 2017; Moeller & Seehuus, 2019; Richardson et al., 2017), aggressive behaviors (Yavuzer et al., 2019), and addictive behaviors (Habibi et al., 2018; Skues et al., 2016) in college students. Satici (2020) examined the mediating role of loneliness in the association between stress and subjective vitality and found the negative predictive effect of loneliness on Turkish college students' subjective vitality. People with positive social relationships with others also reported greater subjective vitality (Akin et al., 2016), and vitality serves as a mitigating mechanism in the association between social relationships and well-being in college students (Akin & Akin, 2015).

Further, we found that subjective vitality mitigated the negative effect of loneliness on psychological adjustment. Higher subjective vitality was associated with fewer psychological adjustment challenges, and loneliness predicted psychological adjustment through college students' subjective vitality. Subjective vitality is a dynamic construct reflecting an individual's subjective experience of being aliveness and physical and mental energy (Ryan & Deci, 2008; Ryan & Frederick, 1997). People with high subjective vitality

are more active and productive, which supports better coping with challenges, enhances psychological well-being, and reduces psychological adjustment difficulties (Kawabata et al., 2017; Ryan & Deci, 2008; Uğur et al., 2019). Theoretically, subjective vitality is based on psychological energy that is an essential resource for performing activities and facilitating better psychological well-being (Deci & Ryan, 2000; Ryan & Deci, 2008). People with high subjective vitality are more likely to regulate their purposive behaviors and actions, which, in turn, enhance their psychological adjustment and well-being (Arslan et al., 2020). Similar to the findings of this study, previous research indicated that subjective vitality was associated with psychological adjustment challenges, including addictive behaviors (Niemic et al., 2010), psychological distress (Rouse et al., 2015), and school burnout (Saricam, 2015). Some research also focused on the mitigating role of subjective vitality on college students' outcomes in the context of adversities (Arslan et al., 2020). For example, Internet addiction was a significant predictor of subjective happiness through subjective vitality (Akin, 2012). Subjective vitality was also positively correlated with physical function and health-related quality of life and was negatively associated with depression, anxiety, and fatigue (Rouse et al., 2015). Hence, these results support that subjective vitality is an important mechanism that may help explain the association between loneliness and college students' psychological adjustment.

Lastly, findings from the current study revealed that college belongingness moderated the mediating role of subjective vitality in the association of feelings of loneliness with psychological adjustment challenges and served as a buffer against loneliness's impacts on subjective vitality. These findings support the notion that college belongingness may serve as a resilience factor in promoting psychological adjustment for young adults with negative life experiences, such as loneliness. A sense of belongingness is a primary human motivator, crucial for forming and maintaining positive social relationships (Baumeister & Leary, 1995). College belongingness is a student's subjective experiences of being accepted, supported, and included by others in the university setting's social environment. Hence, college belongingness is essential for better psychological adjustment and well-being of young people, and people with a high sense of belonging reported fewer psychological adjustment challenges, such as depression, anxiety (Arslan et al., 2020; Arslan & Tanhan, 2019; Davis et al., 2019; Tanhan, 2020) and behavioral problems, such as suicidal behaviors, conduct problems (Arslan, 2019; Arslan & Tanhan, 2019; Olcoñ et al., 2017; Rostosky et al., 2003; Tanhan, 2020). Alkan (2016), for example, found that college belongingness had significant correlations with loneliness, intention to drop out, and satisfaction with the university. College students with a high sense of belonging also exhibited more adaptive help-seeking strategies (Won et al., 2019) and fewer psychological difficulties (Pittman & Richmond, 2007; Thompson et al., 2019).

Consistent with the present results, research further demonstrates that belongingness is an essential protective factor for psychological well-being and adjustment in the context of adversities (Backhaus et al., 2019; Civitci, 2015; Eisenberg et al., 2007; Nuttman-Shwartz, 2019; Zhang et al., 2020). For example, school belongingness was found as a protective factor in the relationship between loneliness and depressive symptoms (Baskin et al., 2010) and moderated the negative impacts of adverse experiences on psychological adjustment (Sargent et al., 2002; Torgerson et al., 2018; Zhang et al., 2020). In Tanhan's (2020) study, the college students also reported home "confinement and feeling stuck in their cities" (19%) and "living in tower blocks" (10%) that caused them to be and feel isolated from other people as some of the most important barriers during the COVID-19 pandemic. In contrast, some participants (9%) reported "living in the house with gardens" and "doing favors for

other people" (9%) that allowed them to socialize with others within a safe space as some of the most important facilitators during the pandemic. The evidence suggests that college belongingness is a power resource for fostering college students' psychological health and well-being has a buffering effect on the negative association of loneliness with psychological adjustment challenges.

Limitations

Results from this study are interpreted in light of some methodological limitations. The present study used a cross-sectional design that cannot ascertain a causal link between the study variables. A longitudinal design is warranted to provide additional insight into the association between the study variables. Secondly, self-report instruments were used to collect the data, which is considered another limitation of the current study. Further research could be conducted to investigate the relationship between the variables using multiple techniques (e.g., qualitative and quantitative). Further, this study only included young adults from a state university in a Turkish, urban area. Additionally, most participants were female, which may be considered a limitation for this study. Given this limitation, future research could be performed to examine the associations found in the current study with diverse and large samples, such as adolescents and older adults.

Implications for Future Research and Practice

Findings from the study provide important implications for research and practice. The study's results show that subjective vitality mitigates the negative effect of loneliness on college students' psychological adjustment. Subjective vitality represents the energy, willingness, and aliveness of college students. Mental health providers could use subjective vitality as a coping strategy for improving the psychological well-being of young adults in university settings. They could focus on positive experiences that can enhance subjective vitality in young adults who exhibit more robust psychological adjustment challenges.

Further, the study results indicate that college belongingness has a buffering effect against the negative impacts of loneliness and moderated the mediating role of subjective vitality in the association between loneliness and psychological adjustment challenges in college students. These results suggest a need to develop more comprehensive intervention strategies for improving psychological health and well-being. Given the protective effect of college belongingness, the sense of belonging can be identified

as an essential aspect of implementing positive psychology-based prevention and intervention services. Specifically, college belongingness could reduce the impacts of adverse experiences on the psychological health and well-being of young adults. Therefore, college belongingness could be integrated with positive psychology-based strategies to improve psychological flourishing in the face of negative experiences.

In conclusion, the present study results indicate that subjective vitality and college belongingness are important mechanisms that may help explain the association between loneliness and psychological well-being in college students during the coronavirus pandemic. Therefore, strategies that promote young adults' level of belonging and subjective vitality could be increased to improve their psychological adjustment and well-being. At this point, counselors or other professions could design and develop preventions and interventions aimed at increasing subjective vitality and college belongingness, which fosters psychological well-being in university settings during this public health crisis.

Compliance with Ethical Standards

Ethical Standards

All study procedures involving human participants followed institutional and/or national research committee ethical standards and the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Declaration of Conflicting Interests

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