



Relationship Satisfaction and Well-being During the COVID-19 Pandemic: Examining the Associations with Interpersonal Emotion Regulation Strategies

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Abstract

Background The COVID-19 pandemic has changed our interpersonal relationships drastically. However, few research studies have examined pandemic-induced stress and its impact on relationship quality. The current research aimed to examine COVID-19 related stress and anxiety in relation to relationship satisfaction, well-being (i.e., positive affect and life satisfaction), and interpersonal emotion regulation strategies (i.e., perspective-taking, enhancing positive affect, social modeling, and soothing), to understand the effects of pandemic-induced stress on both an individual and a relational well-being. The moderating effect of interpersonal emotion regulation strategies toward COVID-19 related stress was also examined.

Methods The sample consisted of 877 married Turkish adults ($N_{\text{female}} = 613$, $M_{\text{age}} = 35.00$; $N_{\text{male}} = 264$, $M_{\text{age}} = 39.21$). Data were analyzed with structural equation modeling, and moderation effects were tested.

Results As hypothesized, structural equation modeling revealed that greater COVID-19 related stress was associated with lower well-being, and that this relationship was mediated by relationship satisfaction. Findings indicated that IER strategy of increasing positive emotions was associated with greater relationship satisfaction and well-being. Unexpectedly, interpersonal emotion regulation strategies moderated neither the relationship between COVID-19 related stress and relationship satisfaction nor the relationship between COVID-19 stress and well-being.

Conclusions Our findings support the vulnerability-stress-adaptation framework and draw attention to the importance of examining the effects of COVID-19 stress and relationship satisfaction.

Keywords COVID-19 related stress and anxiety · Relationship satisfaction · Marriage · Well-being · Interpersonal emotion regulation

Introduction

Novel coronavirus disease 2019 (COVID-19), which is an acute respiratory illness, originated in December 2019 in Wuhan, China and was declared a pandemic by the World Health Organization (WHO) in March 2020. The first case in Turkey was seen on March 11, 2020. As a result, several

countries imposed lockdowns, ordered self-isolation, or urged citizens to practice social distancing. The regulations have drastically changed individuals' daily lives (Cao et al., 2020) by impacting their working conditions, social relationships, and daily life routines (Brooks et al., 2020). The Turkish government's response to COVID-19 during the time these data were collected (March 24–May 30, 2020) included implementing curfews and suspending education in schools and universities, collective Islamic prayer in mosques, and social activities such as scientific, cultural, and artistic activities, and (Budak & Korkmaz, 2020). Additionally, the government encouraged people to work from home and offered financial support (Budak & Korkmaz, 2020). By May 30, more than 150,000 people in Turkey has been infected with COVID-19, and more than 4000 had died (T.C. Ministry of Health, 2020).

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In the current pandemic environment where social relationships are restricted, many individuals have had to spend most of their time with their partners and families (Balzarini et al., 2020). Studies have shown that depression, anxiety, and stress levels have increased during lockdown (Duan & Zhu, 2020). However, few studies have investigated how these changes and pandemic-induced poor well-being relate to marital functioning (e.g., Mousavi, 2020; Overall et al., 2022). Thus, the first aim of the current study was to examine how COVID-19 related stress and anxiety (hereafter referred to as “COVID-19 stress”) relate to well-being and relationship satisfaction among married individuals.

Additionally, supportive romantic relationships can protect people from the damaging effects of stress (Pietromonaco & Collins, 2017). In stressful circumstances, coping strategies (Lazarus & Folkman, 1984), emotion regulation (Moriya & Takahashi, 2013), and close, supportive relationships (Pietromonaco & Collins, 2017) can be essential resources for dealing with the adverse effects of stress. Researchers have recently started examining the interpersonal process of regulating one’s emotions, called interpersonal emotion regulation (Williams et al., 2018; Zaki & Williams, 2013). Interpersonal emotion regulation (IER), a phenomenon that refers to employing social resources to regulate one’s emotions as a social form of coping, is linked with effective social relationships and emotional well-being (Barthel et al., 2018). Due to the positive contribution of IER to relationships and well-being, the current study aimed to understand the role of interpersonal process of regulating emotions on both relationship satisfaction and well-being during the COVID-19. Additionally, we aimed to assess IER as buffering mechanism against adverse effects of the pandemic.

Psychological Sequelae of the Pandemic

A pandemic environment provokes adverse psychological outcomes. Studies on the psychology of epidemics (e.g., SARS, Ebola MERS, and H1N1 flu) have reported increases in anxiety, depression, uncertainty intolerance, and posttraumatic stress symptoms among the general population during previous epidemics (Kamara et al., 2017; Main et al., 2011). Reduced quality of life and psychological distress have been observed for years after a disease outbreak (e.g., Kim & Kim, 2018). Consistent with previous studies, the growing body of research on COVID-19 has shown that the outbreak has been impacting psychological health, as well as physical health (Lee, 2020). Researchers have evaluated various stressors, including the length of the quarantine process, anxiety about being infected, boredom, frustration, lack of basic need fulfillment, insufficient information, financial losses, and social stigma related to infection status (Brooks et al., 2020; Lee, 2020). Participants have reported

high negative psychological well-being proneness (Li et al., 2020); high levels of depression, anxiety, and stress (Duan & Zhu, 2020; Wang et al., 2020); and decreased positive emotions, such as life satisfaction and happiness (Li et al., 2020). One study suggests that economic factors, such as loss of employment and financial concerns due to COVID-19, are important predictors of anxiety and stress symptoms (Nelson et al., 2020).

Bilge and Bilge’s (2020) study on the psychological effects of COVID-19 draws attention to the research conducted in Turkey. The findings of the study reveal that anxiety, depression, and OCD symptoms in the sample group increased significantly after the COVID-19 outbreak. Overall, studies have shown that the pandemic environment and pandemic-induced stressors drastically impact individuals’ well-being. However, there have been no studies on how relationship satisfaction and the well-being of married individuals are affected by the pandemic using Turkish samples. Therefore, this study contributes to our knowledge of Turkish people’s experiences during the pandemic.

COVID-19 Stress and Relationship Quality

While stress impacts well-being at the individual level, it also shapes interaction with significant others, especially romantic partners (Randall & Bodenmann, 2017). In their stress transactional model (STM), Randall and Bodenmann (2009) argue that stress experienced in one domain of life can spill over into other domains and negatively affect relationships (Bodenmann, 2000). The causes of stress can consist of internal or external factors. While internal factors are associated with dynamics within the relationship (e.g., having a conflict with the partner), external factors come from outside of the marriage (e.g., having a bad day at work). External stress can be further separated into two categories: major stressors such as severe illness, loss in the family environment, and critical life events, and minor stressors such as expectations of spouses, negative communication cycle, and health problems (Randall & Bodenmann, 2017). External stress can lead couples to behave in hostile, judgemental, less affectionate, and more disconnected ways, inhibiting relationship functioning (Falconier et al., 2015; Neff & Karney, 2004, 2009). Couples who lack the resources to cope effectively with the additional stress may experience decreased relationship satisfaction, or even relationship dissolution (Bodenmann, 2005).

Indeed, drastic life changes during the COVID-19 pandemic have added external stressors to individuals’ lives (Pietromonaco & Overall, 2020). Relationship functioning has been interrupted due to stress, along with poor individual functioning (Falconier et al., 2015). Thus, external changes experienced with the COVID-19 pandemic (e.g., unemployment, the uncertainty of the future, limited social

connections, economic difficulties, children's responsibility) may turn into internal stress factors in the relationship. A few studies have investigated how romantic relationships are impacted by changes due to the pandemic (Overall et al., 2022). In one study, COVID-19 related stress was negatively associated with relationship quality and positively associated with relationship conflict (Balzarini et al., 2020).

In addition, social distancing practices and lockdowns have brought partners more shared time during the pandemic (Balzarini, 2020). Couples spending more time together may be prone to interpersonal and intrapersonal stress, as financial difficulties, social disconnection, and chronic stress negatively impact relationship satisfaction and stability (Bodenmann, 1997; Karney et al., 2005; Ruffieux et al., 2014).

From a relationship science perspective (Pietromonaco & Overall, 2020), couples with existing vulnerabilities (such as attachment insecurity, social class, minority, age, depression, preexisting relationship quality) are likely to have even greater difficulty coping with major, chronic, and external stressor and to maintain relationship health during a pandemic. An application of the vulnerability-stress-adaptation (VSA) model suggests that the COVID-19 pandemic may interfere with the couples' relationship quality within the wide range of the scope (Pietromonaco & Overall, 2020). According to the VSA framework, COVID-19 conditions create various external stressors that affect adaptive dyadic relationship processes and threaten relationship quality and stability (Pietromonaco & Overall, 2020). A limited number of studies have assessed the mediating role of relationship satisfaction in the relationship between several stressful life factors (i.e., pregnancy) and negative indicators of mental health (i.e., depression, Mangialavori et al., 2021). Recent research during the COVID-19 pandemic shows that the pandemic context negatively affects psychological health and quality of life (Lee, 2020) and poses a threat to romantic relationships and relationship continuity (Pietromonaco & Overall, 2020). Building on previous research, we believe it is important to examine the effects of stress caused by the COVID-19 pandemic on both an individual well-being (i.e., quality of life and positive affect) and a relational well-being (i.e., relationship satisfaction), as well as the potential mediating role of relationship satisfaction, to inform the development of psychological interventions to protect and strengthen intimate relationships.

Moderating Effects of Interpersonal Emotion Regulation Strategies on COVID-19 Stress

Considering the negative impact of stress on relationship quality (Bodenmann, 2000), it is important to understand protective mechanisms. Emotion regulation is an important mechanism in relationship quality and is often seen as an important component of successful interpersonal interaction

(Tani et al., 2015), especially while one is coping with stress (Moriya & Takahashi, 2013). Stressful life events lead people to seek support from others to regulate their emotions by increasing, decreasing, or maintaining the intensity of emotions (Liddell & Williams, 2019). Greater social support helps individuals to deal with threatening circumstances and emotional reactions to internal and external stress (Bodenmann et al., 2015; Coan et al., 2006). Stress and coping theories indicate that threat perception leads people to use coping strategies, regulate their emotions (Lazarus & Folkman, 1984), and turn to their partners for safety and protection. Turning to a romantic partner in times of emotional need increases positive emotional experience and relationship satisfaction (Cheung et al., 2015).

Increasing attention has been given to the relationship between couples' regulation of their feelings and relationship satisfaction in their marriage (Rick et al., 2017; Rusu et al., 2019). Emotion regulation plays a role in shaping the daily emotional experiences and physiological responses of romantic partners. In addition, partners' interdependence of emotion regulation is important for their positive health and well-being and buffering stress (Randall et al., 2013). Using emotion regulation skills in stressful times promotes relationship quality and a positive affective state; therefore, it is positively associated with relationship stability (Rusu et al., 2019; Williams et al., 2018).

Recent studies have explored the interpersonal aspect of emotion regulation (Hofmann, 2014; Zaki & Williams, 2013). Interpersonal emotion regulation (IER) refers to the social and interpersonal processes in which the one's internal emotional states are regulated by others (Hofmann, 2014; Hofmann et al., 2016; Zaki & Williams, 2013). Also, IER provides to affect the emotional states of others (Niven et al., 2009).

However, there is limited knowledge about how IER buffers against stress, how often people use it, and how it affects relationship satisfaction (e.g., Horn & Maercker, 2016). Although some research suggests that using IER strategies helps to reduce psychological distress (Williams et al., 2018), other studies suggest that overusing these strategies may actually increase psychological distress (Dingle et al., 2017; Hofmann et al., 2016; Marroquín, 2011; Mennin et al., 2005) because it reduces one's own internal coping resources (Altan-Atalay & Saritas-Atalar, 2019). Hofmann (2014) states that IER strategies may be problematic or dysfunctional depending in some contexts, and improper use of IER may lead to or exacerbate mental health problems. For example, individuals who have difficulty regulating their own emotions may seek more soothing from others, resulting in greater dependence on someone to regulate their emotions. Hofmann (2014) emphasizes that high or low scores from the IER scale may indicate problems. Similarly, Gökdağ et al., (2019) state that low or high scores in IER

indicate isolation from others or dependence on others, so average scores indicate a more functional state. Both authors recommend examining low, high, and average IER scores in research studies.

Different IER strategies may also have differential effects. Hoffman et al. (2016) defined four IER strategies: (1) *enhancing positive affect* refers to looking for others to increase positive emotions, (2) *perspective-taking* refers to using others as reminders not to worry, (3) *soothing* reflects seeking others for comfort, and (4) *social modeling* reflects observing others' ways of coping. Whereas the soothing dimension is positively related to emotion dysregulation, depression, anxiety, and stress level, perspective-taking is negatively related to stress (Gökdağ et al., 2019). However, there are very few studies on the relationship between IER strategies and relationship quality and well-being. Chan and Rawana (2021) found that greater use of enhancing positive affect and perspective-taking IER strategies are associated with greater well-being and relationship quality. However, using a soothing strategy is found to be associated with lower well-being. This recent study shows that IER strategies may impact well-being differently. Yet, there is a need for further research to understand the role of IER strategies in different contexts. Therefore, we suggest that using IER strategies may act different roles on COVID-19 stress and contribute positively or adversely to relationship satisfaction, and emotional well-being.

Current Study

Building on the growing literature, the present research aimed to examine the relationships among COVID-19 stress, subjective well-being, and relationship satisfaction in married individuals and to test whether interpersonal emotion regulation moderates the relationship between COVID-19 stress and relationship satisfaction, and subjective well-being. Previous research examining stress and coping in relation to subjective and relational well-being has demonstrated that stress negatively impacts relationship satisfaction (Bodenmann, 2000). The present study adapted this literature to understand how stress relates to relationship satisfaction and subjective well-being in the context of the COVID-19 pandemic. We predicted that COVID-19 stress would be negatively associated with subjective well-being (i.e., life satisfaction and positive affect). This association would be accounted for by feelings of dissatisfaction in a relationship, as measured by dyadic adjustment.

The second aim of this study was to understand the moderating role of interpersonal emotion regulation. Previous studies have shown that emotion regulation can buffer the impact of stress on relationship satisfaction (e.g., Moriya & Takahashi, 2013). In addition, different IER strategies—specifically,

enhancing positive affect and perspective-taking—were found to be related to higher relationship quality and greater well-being (Chan & Rawana, 2021). Despite the absence of empirical evidence, it is plausible that IER strategies may moderate the relationships between COVID-19 related stress and both relationship satisfaction and well-being indices. There was no a priori hypothesis as the objective would be exploratory in nature.

Method

Participants

Participants were recruited from social media platforms (e.g., Instagram, Twitter) and by offering extra credit to undergraduate students in exchange for recruiting participants. To be eligible to participate, participants had to be at least 18 years old and married. The final sample consisted of 877 (71% female) married adults from Turkey. The mean age for women was 35.0 ($SD=9.33$), and the mean age for men was 39.21 ($SD=10.31$). Participants varied with respect to education level, with 55.7% having at least a college degree, 24.5% a high school degree, and 19.3% a primary or secondary school diploma. Almost half of the participants (47%) were unemployed, 41.2% had a full-time job, and 9.2% reported working part-time. Of those who were employed, 20.8% continued working in offices during the pandemic, 46.0% continued working from home, and 23.2% were on paid or unpaid leave. The majority of participants came from a middle-class background (92.7%). Seventy-five percent of the participants reported having at least one child.

Procedure

A cross-sectional study design was used to assess the relationships between COVID-19 stress and subjective well-being, interpersonal emotion regulation, and relationship satisfaction. Participants completed an online survey (launched on March 24, 2020, and closed on May 30, 2020) via Qualtrics shortly after the global pandemic was declared. Questionnaires were administered in the same order for all participants. Informed consent was obtained from all individual participants included in the study. All procedures were approved prior to data collection by the Institutional Ethics Committee of Fatih Sultan Mehmet Vakıf University. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Measures

Demographics

The demographic questionnaire included the date of birth, gender, level of education, employment, marital status,

parental status, and working conditions (unemployed, part-time employed, etc.).

COVID-19 Related Stress and Anxiety

The 9-item COVID-19 related stress and anxiety scale (CSAS) was developed in a nationally funded project (Bilican, 2020), in which the first author was involved, and its reliability and validity analysis was firstly presented in this paper. The CSAS assesses perceptions of uncertainty, perceptions of risk related to the pandemic, and general stress via a 7-point Likert scale. Scale development followed Boateng and colleagues' (2018) three-phase scale development procedure. First, the items were developed according to measures used in prior research to measure Ebola-related worry (Thompson et al., 2017) and SARS-related stressors (Main et al., 2011). A pool of 21 items was constructed for the preliminary version of the CSAS based on stress and anxiety scales and changes in everyday life due to COVID-19. Three expert clinical psychologists assessed the items, and nine items were removed from the scale per their suggestions. A group of individuals from the target population evaluated the items. Second, the items were tested. Item correlations ranged between 0.40 to 0.69, and a significant Bartlett's test showed appropriateness for factor analysis; $\chi^2(36) = 4202.77$, $p < 0.001$. An exploratory factor analysis was conducted and revealed that the scale has a unidimensional structure. Three items were removed from the scale due to low factor loadings. The final scale consists of 9 items. Items include: "How often have you felt worried about getting infected with COVID-19 during the past week?", "Over the past week, have you had any negative thoughts about COVID-19 even when you did not want to?", "Have you ever taken repetitive involuntary actions to deal with your negative thoughts? (Washing hands, washing objects, checking, etc.?)" The final model had good model fit; $\chi^2(20) = 190.07$, $p < 0.001$, CFI = 0.96, RMSEA = 0.10, SRMR = 0.04. Factor loadings ranged between 0.65 and 0.83. With respect to criterion validity, moderate to high correlation coefficients were found between the CSAS and the depression, anxiety, stress scale-21 (DASS21, developed by Henry & Crawford, 2005; adapted to Turkish by Yıldırım et al., 2018). The coefficients ranged from 0.53 to 0.61. A significant negative correlation was found between the CSAS and the Oxford Happiness Scale (developed by Hills & Argyle, 2002; adapted to Turkish by Doğan & Çötök, 2011), $r = -0.17$. Split half reliability was 0.83 and 0.86 for the two groups. The correlation between the two split groups was 0.84, indicating high reliability. Cronbach's alpha for the scale was 0.91.

Relationship Satisfaction

Relationship satisfaction was assessed with the revised dyadic adjustment scale (Busby et al., 1995), which was adapted to Turkish by Gündoğdu (2007). The scale consists of 14 items assessing relationship satisfaction in three domains—consensus, satisfaction, and cohesion—on a 5-point Likert scale. Items include: "How often do you discuss, or have you considered divorce, separation, or terminating your relationship?" and "Do you ever regret that you married (or lived together)?" Confirmatory factor analysis conducted for the present study confirmed the three-factor model $\chi^2(74) = 421.32$, $p < 0.001$, CFI = 0.91, RMSEA = 0.08, SRMR = 0.05. Factor loadings ranged between 0.48 and 0.79. Cronbach's alpha was 0.63.

Interpersonal Emotion Regulation

The Interpersonal Emotional Regulation Questionnaire was developed by Hofmann and colleagues (2016) to measure the interpersonal dimension of emotion regulation. The scale, consisting of 20 items, includes four dimensions (enhancing positive affect, perspective-taking, soothing, and social modeling). There are five items for each dimension, and the items are rated on a 5-point Likert scale. The IER was adapted to Turkish by Gökdağ and colleagues (2019). Both total scores and subscale scores were included in the current study. Confirmatory factor analysis of the total score conducted for the present study showed adequate fit, $\chi^2(87) = 761.28$, $p < 0.001$, CFI = 0.90, RMSEA = 0.10, SRMR = 0.05. Factor loadings ranged between 0.59 and 0.86. Cronbach's alpha was 0.94 for the total score, 0.87 for enhancing positive affect, 0.80 for perspective-taking, 0.88 for soothing, and 0.88 for social modeling.

Well-being Indices

Well-being is a complex construct that includes diverse concepts ranging from affective evaluation (pleasant and unpleasant emotions) to cognitive assessment (global life judgments and domain satisfaction) (Diener, 2000; Diener et al., 2009). Three components of well-being that are frequently studied include: life satisfaction (global judgments of one's life), positive affect, and negative affect (Kamp et al., 2008). In this study, we focus on life satisfaction and positive affect for a broad understanding of the association between marital happiness, interpersonal emotion regulation, and well-being.

Life Satisfaction Life satisfaction was measured with the satisfaction with life scale developed by Diener and colleagues (1985), which was adapted to Turkish by Dağlı and Baysal (2016). The scale consists of five items assess-

ing global life satisfaction. An example item is, "In most ways, my life is close to my ideal." Items are rated from 1 (strongly disagree) to 7 (strongly agree), with possible total scores ranging from 5 (very low level of life satisfaction) to 35 (high level of life satisfaction). Confirmatory factor analysis conducted with the present sample confirmed the one-factor model, $\chi^2(5)=38.35$, $p<0.001$, CFI=0.98, RMSEA=0.09, SRMR=0.02. Factor loadings ranged between 0.74 and 0.81. The satisfaction with life scale demonstrated good internal consistency in this study (Cronbach's $\alpha=0.86$).

Positive Affect Affect was measured with the Positive and Negative Affect Schedule developed by Watson et al. (1988), which was adapted to Turkish by Gençöz (2000). Only the positive affect subscale, comprising ten items, was used in the study. Positive affect items include "active," "alert," and "inspired." Items are rated from 1 (very little) to 7 (very much) with total scores ranging from 10 to 70. Confirmatory factor analysis conducted for the present sample showed good fit; $\chi^2(35)=171.30$, $p<0.001$, CFI=0.95, RMSEA=0.07, SRMR=0.04. Factor loadings ranged between 0.42 and 0.79. Internal consistency was 0.87 in this study.

Data Analysis

The proposed theoretical model was tested using a hybrid structural equation model in R (Version 3.6.2; R Core Team, 2019). First, a measurement model assessed the fit of the latent constructs (COVID-19 stress, relationship satisfaction, positive affect, and life satisfaction). Second, after establishing a good fitting measurement model, a proposed structural model was specified and tested. A variety of fit indices were used to assess the model fit: the chi-square statistic, the root-mean-square error of approximation (RMSEA), the comparative fit index (CFI), and the standardized root-mean-square residual (SRMR). The following cutoff scores for indices were used to assess good model fit: a nonsignificant and small chi-square, an RMSEA lower than 0.05, a CFI larger than 0.90, and an SRMR lower than 0.08 (Kline, 2010). The full information maximum likelihood (FIML) method was used to estimate parameters in the model. The FIML method uses the implied values of the missing data to calculate parameter estimates. Additional to the proposed structural model, an alternative model was tested because the literature suggested possible bidirectional relationships between variables.

Additional analyses were conducted to test the moderating effects of interpersonal emotional regulation and its dimensions, enhancing positive affect, perspective-taking, soothing, enhancing positive affect, and social modeling. IER and each dimension were coded into three categories:

below -1 SD is low, above $+1$ SD is high, mean scores between ± 1 SD range is average. First, fully constrained (slopes for each group specified as equal) and unconstrained (slopes for each group allowed to vary freely) models were compared using the chi-square comparison test. Then, the path between COVID-19 stress and relationship satisfaction was tested across groups for each interpersonal emotional dimension as recommended by Kline (2010), while the other paths in the model remained constrained.

Results

Preliminary Analysis

A correlation test was run to see the relationships among variables in the proposed model, as well as participants' responses to their living conditions during the pandemic (see Table 1). The results showed that COVID-19 stress was negatively and significantly correlated with relationship satisfaction and well-being indices and positively correlated with interpersonal emotional regulation subscales. Relationship satisfaction showed moderate to strong correlations with well-being indices, and the interpersonal emotional regulation subscales were strongly correlated with one another.

Having at least one child significantly and negatively correlated with relationship satisfaction. Taking more responsibility for the child compared to the partner was negatively related to relationship satisfaction and life satisfaction. Responsibility for house chores was positively correlated with COVID-19 stress and negatively correlated with relationship satisfaction. Participants who take more household responsibility compared to their partner showed higher levels of COVID-19 stress and lower levels of relationship satisfaction. An ANOVA was conducted to test the effect of working conditions during the pandemic on stress. There were no significant differences among participants who had full-time or part-time jobs, were retired, or were unemployed on COVID-9 stress. Among employed participants, no significant differences were found between those who were working in the office, working at home, or on leave in terms of COVID-19 stress, relationship satisfaction, and well-being. Considering that the COVID-19 stress and anxiety may differ due to the long data collection time interval, four percentiles were created with regard to the participants' response times to the questionnaire. It was observed that the majority of the participants responded to the questionnaire at the onset of the pandemic ($n=825$). ANOVA was conducted to test whether different response times made differences for COVID-19 stress levels. No significant differences were observed between the time groups [$F(3-873)=0.891$, $p=0.445$].

Table 1 Descriptive statistics and covariances for the latent variables estimated in the measurement model

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. COVID-19 stress	3.45	1.26											
2. Relationship satisfaction	3.67	0.59	-0.10**										
3. Positive affect	2.86	0.83	-0.15**	0.25**									
4. Life satisfaction	4.91	1.16	-0.13**	0.44**	0.28**								
5. Enhancing positive affect	3.82	0.80	0.03	0.12**	0.09*	0.19**							
6. Perspective-taking	2.74	0.90	0.18**	-0.02	0.09*	0.09*	0.43**						
7. Soothing	2.97	0.99	0.20**	-0.07*	0.06	0.02	0.45**	0.72**					
8. Modelling	2.98	0.94	0.16**	-0.02	0.05	0.05	0.50**	0.79**	0.76**				
9. IER total	3.13	0.76	0.17**	-0.00	0.09*	0.09**	0.68**	0.88**	0.88**	0.91**			
10. Parental status	0.75	0.43	-0.03	-0.23**	-0.03	-0.03	-0.05	0.05	0.03	0.01	0.01		
11 House chore responsibility	5.83	2.63	0.10**	-0.14**	-0.05	-0.05	0.10**	0.08*	0.14**	0.11**	0.13**	0.04	
12. Childcare responsibility	5.19	3.03	0.03	-0.23**	-0.00	-0.09*	0.03	0.09*	0.13**	0.08*	0.10**	0.39**	0.55**

M and SD are used to represent mean and standard deviation, respectively. Parental status was dummy coded as 0 = not having a child, 1 = having at least one child. House chore and childcare responsibility items are continuous variables ranged between 0 and 10 and 0 indicates individual takes no responsibility and 10 indicates individual takes all responsibility * $p < 0.05$. ** $p < 0.01$

Measurement Model

A structural equation model was used to test COVID-19 stress and relationship satisfaction as predictors of well-being, using FIML estimation in R Version 3.6.2. In the first step, items of each construct, namely COVID-19 stress, relationship satisfaction, positive affect, and life satisfaction, were specified as indicators of each latent variable, and all possible covariances among latent variables were specified. All latent variables showed significant correlations between each other. The final model fit was good, $\chi^2(652, N = 877) = 1809.65, p < 0.001, RMSEA = 0.045, 90\%$ confidence interval [CI (0.043, 0.047)], CFI = 0.91, SRMR = 0.05. Table 1 shows the factor means and standard deviations, and correlations.

Structural Model

Next, the structural model was specified based on the proposed theoretical model (see Fig. 1), with COVID-19 stress predicting relationship satisfaction, positive affect, and life satisfaction and relationship satisfaction predicting positive affect and life satisfaction. The structural model was kept as proposed in the theoretical model. The model fit was the same as in the measurement model and good, $\chi^2(652, N = 877) = 1809.65, p < 0.001, RMSEA = 0.045, 90\%$ confidence interval [CI (0.043, 0.047)], CFI = 0.91, SRMR = 0.05. Figure 1 displays standardized coefficients. The Monte Carlo simulation was used to calculate indirect effects (Selig & Preacher, 2008), and percent mediated was calculated with the ratio of the indirect effect on the total effect. Results (see Table 2) showed that relationship satisfaction had a significant yet small mediating effect on the relationship between COVID-19 stress and positive affect (12%). The mediation effect of relationship satisfaction on the relationship between COVID-19 stress and life satisfaction was significant and larger (33%) compared to its mediational role between COVID-19 stress and positive affect.

Given that relationship satisfaction and psychological well-being tend to decline on average with parenting role stress and taking more responsibility for the child compared to the partner (Ehrenberg et al., 2001), we added these conditions to the model to test their impact. The findings reported above remained significant when we controlled for parenting status and how much they shared the childcare and household responsibilities.

An Alternative Model

A nested alternative model was tested following the same analytical procedure explained for the original structural model. AIC, BIC, and chi-square scores were used to compare the alternative model to the original structural model

Fig. 1 Theoretical structural model and results. Standardized coefficients are shown. Indicators, error covariances, and covariances are not displayed, for clarity of presentation. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

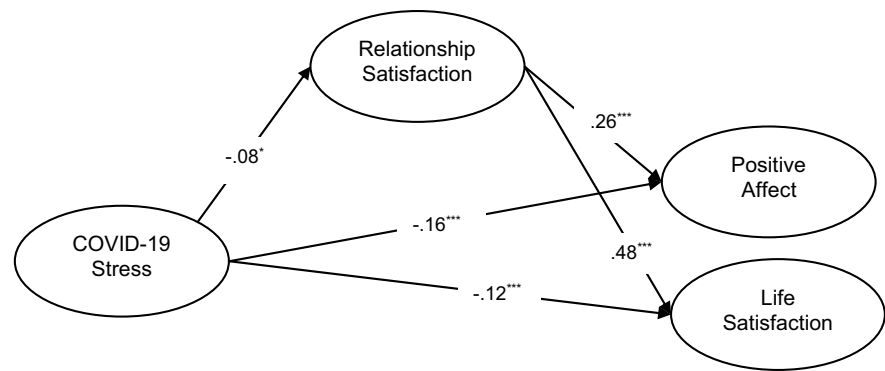


Table 2 Parameter estimates from the structural model testing

Path	<i>b</i>	β	<i>SE</i>	95% CI [LL, UL]
Covid → CA	− 0.04*	− 0.08*	0.02	
Covid → Positive affect	− 0.07***	− 0.16***	0.02	
Covid → Life Satisfaction	− 0.15***	− 0.12***	0.04	
CA → Positive affect	0.22***	0.26***	0.04	
CA → Life Satisfaction	1.17***	0.48***	0.12	
Covid → CA → Positive affect	0.009*			[0.001, 0.019]
Covid → CA → Life satisfaction	− 0.049*			[− 0.097, − 0.003]

b unstandardized estimates, β standardized estimates, *SE* standard error, *CI* confidence intervals, *LL* lower limit, *UL* upper limit, *Covid* COVID-19 stress, *CA* relationship satisfaction * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

(AIC = 89,905, BIC = 90,512). The alternative model tested the mediating role of well-being indicators on the path from COVID-19 stress to relationship satisfaction. The model had a worse fit compared to the original model, $\chi^2(653, N = 877) = 1862.74, p < 0.001$, AIC = 89,956, BIC = 90,558. Although the original model was found to be significantly better, the alternative model showed overall a good fit. The results support the current order of the variables and indicate a bidirectional relationship between relationship satisfaction and well-being indicators.

Moderator Role of Interpersonal Emotional Regulation

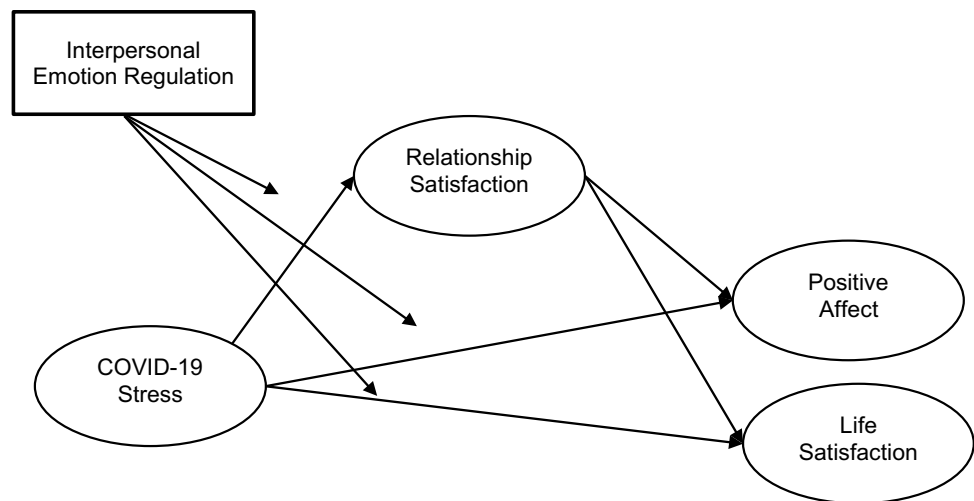
A multiple-group structural equation model was then estimated to test whether interpersonal emotion regulation moderates the relationships between COVID-19 stress and both relationship satisfaction and the well-being indices using FIML estimation. In addition to the total IER score, the four dimensions of interpersonal emotional regulation (enhancing positive affect, perspective-taking, soothing, and social modeling) were tested separately as moderators. These variables were recoded into categorical variables to create low, moderate, and high-level emotional regulation groups for each subscale. Scores within ± 1 SD from the mean were coded as *moderate*, scores less than -1 SD from the mean were coded as *low*, and

scores greater than 1 SD from the mean were coded as *high*. Then the theoretical model was tested across the groups for each dimension.

The specified structural model in Fig. 2 was tested across groups to examine differences in slopes and intercepts. First, a fully constrained model in which the slopes for each group were specified as equal was estimated for each subscale. Then, fully unconstrained models in which the slopes varied freely were estimated. Lastly, theoretically proposed models in which only the path from COVID-19 stress varied freely whereas the rest of the slopes were constrained to be equal were estimated. Through chi-square difference testing, the best fitting model was chosen. Table 3 displays the model fit for each model tested for enhancing positive affect, perspective-taking, soothing, and social modeling subscales and total score. Chi-square difference tests showed no significant differences across groups for total IER scores and subscales when fully constrained and fully unconstrained models compared, meaning that IER did not moderate any paths in the model.

Discussion

The COVID-19 pandemic has induced a high level of stress in individuals' lives and deteriorated physical and subjective well-being (e.g., Li et al., 2020). However, only a few studies

Fig. 2 Theoretical moderation model**Table 3** Constrained and unconstrained model comparisons for interpersonal emotional regulation group comparisons

		χ^2 (df)	CFI	RMSEA	90% CI [LL–UL]	SRMR	AIC	BIC	<i>p</i>
Enhancing positive affect	Fully constrained model	3469.97 (1966)	0.89	0.05	0.048–0.054	0.7	89,954	91,726	0.122
	Fully unconstrained model	3465.75 (1964)	0.89	0.05	0.048–0.054	0.7	89,954	91,736	
Perspective-taking	Fully constrained model	3525.64 (1966)	0.89	0.05	0.049–0.055	0.07	90,008	91,780	0.581
	Fully unconstrained model	3524.56 (1964)	0.89	0.05	0.049–0.055	0.07	90,011	91,792	
Soothing	Fully constrained model	3456.92 (1966)	0.89	0.05	0.048–0.054	0.07	90,008	91,780	0.075
	Fully unconstrained model	3451.74 (1964)	0.89	0.05	0.048–0.054	0.07	90,007	91,789	
Social modelling	Fully constrained model	3467.05 (1966)	0.89	0.05	0.048–0.054	0.06	90,077	91,849	0.061
	Fully unconstrained model	3461.44 (1964)	0.89	0.05	0.048–0.054	0.06	90,075	91,857	
Total	Fully constrained model	3501.13 (1966)	0.89	0.05	0.049–0.054	0.07	90,077	91,849	0.109
	Fully unconstrained model	3496.69 (1964)	0.89	0.05	0.049–0.054	0.07	90,077	91,858	

CFI the comparative fit index, *RMSEA* the root-mean-square error of approximation, *SRMR* the standardized root-mean-square residual *p*-value shows the chi-square comparison test significance

have investigated how romantic relationships are affected by these stressful changes (Overall et al., 2022). Previous research has demonstrated strong relationships between stress, relationship satisfaction, and psychological health (Falconier et al., 2015; Ryff & Singer, 2000). The current study expanded upon the literature by examining the effects of stress related to the pandemic on both individual (quality of life and positive affect) and relational (relationship satisfaction) well-being. In addition, the role of interpersonal emotion regulation in the relationship of COVID-19 related stress with relationship satisfaction and well-being indices was investigated. Overall, the results showed that greater COVID-19 stress was associated with lower subjective well-being, as indicated by decreased life satisfaction and positive affect. The relationship between COVID-19 stress and well-being was significantly mediated by relationship satisfaction. Contrary to our expectations, the relationship between COVID-19 stress and relationship satisfaction was not moderated by interpersonal emotion regulation.

COVID-19 Stress and Relationship Satisfaction

As predicted, high COVID-19 stress was associated with poor well-being, and this relationship was mediated by relationship satisfaction. The findings that showed a significant negative association between COVID-19 stress and relationship satisfaction corroborate prior work demonstrating the detrimental role of social deprivation (Flora & Segrin, 2000), financial strain (Bodenmann, 1997; Karney et al., 2005), anxiety, and external stressors (e.g., Randall & Bodenmann, 2009) on relationship quality. This suggests that COVID-19 and conditions induced by the pandemic may be important stressors for individuals and their relationships. The finding of the current study on the relationship between COVID-19 stress and relationship satisfaction was not surprising. As literature on stress transactional model (STM) suggests major stressors can lead to negative relationship functioning and satisfaction (e.g., Falconier et al., 2015). Current study showed that COVID-19 is a significant stressor that should be evaluated as a major

external stressors along with other stressors and factors that may impact relationship satisfaction.

The COVID-19 pandemic may be experienced by participants as an external stressor within their relationships. From the standpoint of the STM, the couple's dynamics are likely to be affected negatively by the intrapersonal stress that each partner experiences from external stressors, creating, in turn, interpersonal stress for both partners (Falconier et al., 2015). COVID-19 stress as an major external stressor might have created internal stress factors in the relationship by affecting behaviors, assessments, and interactions of partners in a negative way. Future research should aim to examine underlying mechanisms of a spillover effect during a pandemic environment.

Relationship satisfaction was significantly associated with subjective well-being indices. This result aligns with previous studies. Many studies indicate that there is a strong association between relationship quality and psychological health (e.g., Debrot, 2012; Ryff & Singer, 2000). Close relationships can provide safety, comfort, and protection during stressful circumstances (Pietromoaco & Collins, 2017).

Thus, the results may be expected to reflect certain differences between men and women in terms of experiencing stress and its impact. Research on COVID-19 pandemic revealed that women have experienced greater stress (Mazza et al., 2020) and increased domestic responsibilities (Andrew et al., 2020) compared to men since the onset of the COVID-19 (Mazza et al., 2020). Some studies indicated that COVID-19-related stress was a significant predictor of life satisfaction for women but not men (e.g., Tharp et al., 2021). Past studies showed that women reported higher levels of extradyadic stress from daily hassles and intradyadic stress from relationship problems as well more symptoms of depression and anxiety (Falconier et al., 2015; Neff & Karney, 2005). However, women reported to be as satisfied with their relationship as men did (Falconier et al., 2015). The significant associations revealed in the current study may be reflecting these differences and significance may be due to the women majority sample. Future dyadic studies will be important both to evaluate the differences between men and women due to major external stressors such as COVID-19 pandemic and to examine the crossover effect of stress. A dyadic data collected from both partners and using APIM analysis would give more insights on gender differences that may occur.

In addition, results suggest that relationship satisfaction mediates the relationship between COVID-19 stress and well-being indices. The mediation effect of relationship satisfaction was larger on the relationship between COVID-19 stress and life satisfaction than on the relationship between COVID-19 stress and positive affect. In other words, results revealed that COVID-19 stress was negatively associated with well-being not only directly, but also indirectly through decreasing relationship quality.

Interpersonal Emotion Regulation, Relationship Quality, and Well-being

Our findings suggest that the IER strategy of increasing positive emotions is associated with greater relationship satisfaction and well-being, similar to the study of Chan and Rawana (2021). The positive yet small correlation between the soothing dimension of IER and COVID-19 stress is consistent with the findings of Gökdağ et al., (2019). However, the small positive correlation between the perspective-taking dimension of IER and COVID-19 stress stands in contrast to existing literature (Altan-Atalay & Saritas-Atalar, 2019). Both of these findings are consistent with the notion that interpersonal emotion regulation may be responsible for the maintenance of stress and anxiety (Hofmann, 2014). Additionally, a small negative association between relationship satisfaction and the soothing subscale of IER was found. One possible explanation for this finding is that people who experience greater difficulty regulating their emotions may need to be soothed more by others and may become dependent on others to regulate their emotions. If excessive, this dependency could harm relationship quality. Our findings contrast with the results of previous studies that showed that people who use interpersonal emotion regulation skills experience positive emotions, share their emotions more openly with others, engage with others more, and feel more intimacy with others compared to people who do not use these skills (Williams et al., 2018). Considering that both members of the couple may be experiencing high stress during the pandemic, greater difficulty providing effective support to each other may have prevented the exchange of comfort in the relationship. However, the findings should be interpreted with caution due to the small effect sizes.

Importantly, in contrast to our hypotheses, IER strategies did not buffer the negative effect of COVID-19 stress on marital health and personal well-being. Research suggests that interpersonal emotion regulation strategies, similar to intrapersonal emotion regulation, may be problematic or dysfunctional depending on the context. Furthermore, regulating negative emotions in the interpersonal context may be related to difficulties with intrapersonal emotion regulation (Hofmann et al., 2016). Examination of difficulties in emotion regulation could help to understand the mechanism of interpersonal emotion regulation in the current study. Future studies may examine intrapersonal emotion regulation mechanisms to have a better understanding of interpersonal emotion regulation.

Complex, nonlinear long- and short-term mechanisms may characterize the role of interpersonal emotional regulation on stress and relationship satisfaction. Examining the effects of the long-term use of interpersonal emotion regulation in different contexts may elucidate the underlying mechanism of interpersonal emotion regulation in romantic

relationships, and individual well-being (Marroquin, 2011). Future studies may focus on the underlying complex mechanisms to shed light on how interpersonal emotional regulation interplays with stress and interpersonal relationships, and well-being, especially in high-stress environments.

Furthermore, findings point out the importance of investigating the nonlinear relationships of IER strategies. Hofmann (2014) has discussed how IER strategies may be problematic or dysfunctional when excessive use leads individuals to being dependent on others to regulate their emotions. Although the current study indicates that using IER strategies at different levels did not reveal a significant contribution to COVID-19 stress, it opened a way to understand the relationship health and individual well-being. Findings suggest that dealing with low and moderate level perspective taking and modeling coping strategies moderated the path from relationship satisfaction to positive affect. In future studies, it is recommended that both the theoretical framework and clinical significance of this finding be examined longitudinally.

Study Implications

The findings of this study have practical implications for the COVID-19 process and marital relationships. The findings of the current study contribute to our understanding of stress processes using the vulnerability-stress adaptation framework by providing more information about the adverse effects of the COVID-19 pandemic which is an example for major external stressors (Pietromonaco & Overall, 2020). The main implication of the current study is that, if families and public health initiatives aim to bolster wellbeing and resilience for individuals during the pandemic, they can place emphasis on practices aimed at reducing stress and strengthening relationship health. For marital relations, engaging in supportive processes, responsiveness, and problem-solving may help to reduce pandemic-related challenges on relationship quality (Pietromonaco & Overall, 2020). Intimacy-building activities for partners, spending more time together, and sharing positive events can be an opportunity for relationship growth in the COVID-19 pandemic (Neff & Karney, 2017). Dynamics and resilience factors keeping the relationship strengths in the presence of external stressors may result in married people coming out of the pandemic process strongly.

The results may also contribute to the development of preventive and intervention efforts for the pandemic process in the relationship and family context. In this context, couples coping enhancement training (CCET; Bodenmann & Shantinath, 2004) focused on preventing and alleviating stress between partners may help couple therapists in dealing with negative effects of COVID-19 stress on relationship quality and develop effective individual and dyadic coping strategies for couples.

Limitations and Future Directions

Although the present study has provided initial findings to the literature on the COVID-19 pandemic, it also has limitations. First, the cross-sectional nature of the data does not allow researchers to claim any causal connections between the variables. Our results can only be viewed as supportive of the stress theories (STM; Randall & Bodenmann, 2009), but they cannot exclude the possibility that other models may also fit the data acceptably. A longitudinal design would provide more information about causal mechanisms in the model. Relatedly, the current analyses rely on the reports of individuals who completed the survey shortly after the social isolation process and only at a one-time point. Therefore, it remains unclear how COVID-19 stress is affecting daily relationships as the pandemic has progressed. Longitudinal studies are important to understand the changes of the experiences over the course of the pandemic. In the current study, participants were compared in regard to their response time, and it was seen that they did not differ in the context of COVID-19 stress levels. This may be related to the specific time period of the current study. It can be predicted that the course of the pandemic we are in and the changes in restrictions and economic strains may affect differently individual and relational well-being of individuals. Therefore, longitudinal studies are needed to understand how the experiences of the pandemic has changed over time and what the relational and individual outcomes of these changes are.

In addition, future studies should assess individual and relational outcomes of the COVID-19 process not only through self-report questionnaires but also through physiological, observational, or diary measures. Diary studies are important for understanding the change in relationship quality. Diary studies will contribute to a more detailed understanding of the stress factors (such as parenting stress, remote work, sharing responsibilities, etc.) during the COVID-19 process and see which factors negatively affect the quality of the relationship. Future studies may examine whether intra- and extradyadic COVID-19 stress have differential effects on well-being and marital relations. In addition, by taking into account the internal stress factors, the spillover effects of COVID-19 stress on relationship distress can be examined. In addition, COVID-19 stress is just an example of major external stressors. Future studies should take into consideration other major external stress factors during the pandemic and compare the effects of these factors with COVID-19 stress.

Second, this study has focused only on interpersonal emotion regulation as a potential buffering mechanism. Future studies should investigate other protective mechanisms (e.g., dyadic coping, intimacy, perceived partner responsiveness, support) and couples' resilience factors for relationship stability. Third, the data were collected only from married individuals. Dyadic data could be more informative

about the interpersonal dynamics of marital relationships. A dyadic study can provide to understand the crossover effects of COVID-19 related stress and provide more insight for the buffering mechanism against COVID-19 related stress. Even if one partner is experiencing intense stress, the other partner's support, emotion regulation, and coping skills can reduce or eliminate the intensity of the other partner's stress experience over the course of the pandemic. Future work might aim to understand how a partner's intra- and interpersonal emotion regulation skills help the other partner to cope with COVID-19 related stress. Dyadic research may suggest the intervention to strengthen the relationship quality during the pandemic process. Fourth, it is also important to caution about the generalizability of the findings as they may be related to the use of a convenience sampling method.

Conclusion

Maintaining a healthy relationship with one's romantic partner is important, especially during stressful circumstances. Relationship quality can affect psychological and physical well-being. Findings from the current study contribute to our understanding of stress processes in the context of marital relationships during the COVID-19 pandemic. Our findings support the vulnerability-stress-adaptation framework and draw attention to the importance of examining the effects of COVID-19 stress and relationship satisfaction. COVID-19, as an external stressor, has the potential to increase internal stress, thereby decreasing relationship satisfaction and, eventually, general well-being. Our results can guide future research and clinical work.

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Data Availability The datasets generated during the current study are available from the corresponding author on reasonable request.

Declarations

Conflict of Interest Authors Zahide Tepeli Temiz and Ebra Elshar-nouby have no conflicts of interest to declare that are relevant to the content of this article.

Research Involving Animal Participants No animal studies were carried out by the authors for this article.

Informed Consent All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (national and institutional). Informed consent was obtained from all individual subjects participating in the study.

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