

ORIGINAL ARTICLE

Work–family conflict and posttraumatic stress symptoms among college teachers during the COVID-19 pandemic

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Abstract

The study aimed to examine the indirect factors underlying the association between work–family conflict and posttraumatic stress symptoms (PTSS) in college teachers during the COVID-19 pandemic. Three potential indirect factors were examined: perceived stress, basic psychological needs, and rumination. A total of 274 college teachers were recruited. All participants completed an electronic questionnaire that assessed their exposure to the pandemic, work–family conflict, perceived stress, basic psychological needs, rumination, and PTSS. The results showed that after controlling for pandemic exposure, gender, and age, work–family conflict was associated with PTSS via perceived stress alone, rumination alone, a path from perceived stress to basic psychological needs, and a path from perceived stress to rumination. These results indicate that work–family conflict is positively associated with PTSS indirectly via perceived stress, rumination, and basic psychological needs during the COVID-19 pandemic. These three mediators may completely explain the relation of work–family conflict to PTSS.

KEYWORDS

basic psychological needs, perceived stress, posttraumatic stress disorder symptoms, rumination, work–family conflict

INTRODUCTION

The COVID-19 pandemic has been described as a major traumatic event (Shevlin et al., 2020) that has caused substantial mental health problems such as depression, anxiety, and posttraumatic stress disorder symptoms (PTSS; Liu et al., 2020; Xiang et al., 2020; Zhen et al., 2021). There is evidence that some individuals have developed PTSS as a result of the COVID-19 pandemic (Shevlin et al., 2020); the prevalence rate of posttraumatic stress disorder (PTSD) among adults is 7.6% (Zhang & Ma, 2020). However, some individuals are at higher risk of developing PTSS, such as those with high levels of work-related stress. For example, teachers have not only experienced the negative effects of the COVID-19 pandemic but also have assumed the responsibility for teaching students and helping those with mental health problems. This psychological pressure is likely to have increased stress symptoms and aggravated existing psychological problems in teachers. Some evidence has supported this; the reported prevalence of acute stress disorder among teachers during the COVID-19 pandemic was 9.1% (Zhou & Yao, 2020), and the prevalence of PTSD among

teachers has been variously reported as 12.3% and 24.55% (Fan et al., 2021; Kukreti et al., 2021), which is higher than that among university students (2.7%, Kukreti et al., 2021) and some health care professionals (16.7%, Blekas et al., 2020). Posttraumatic stress disorder has a negative effect on the quality of teachers' work, on their overall life satisfaction, and on their students' mental health (Chen et al., 2014). Alleviating teachers' PTSS during the COVID-19 pandemic should therefore be a priority, as this would benefit both education and mental health.

To reduce PTSS in teachers, it is helpful to consider underlying predictors of PTSS and the factors that affect their development. According to a model proposed by Freedy et al. (1992), factors that affect the development of PTSS include predisaster factors (e.g., gender, age), within-disaster factors (e.g., witnessing the death or injury of others, or being informed later about such an event), and postdisaster factors (e.g., coping, perceived support). Although all these factors may affect the occurrence and development of PTSS, there is evidence that postdisaster factors have the greatest effect (Trickey et al., 2012). We therefore focused on posttrauma factors in this study.

Lockdowns have been used in many countries to control the COVID-19 outbreak. Many teachers have been asked to teach or work online from home, which blurs the boundaries between their work and private lives. Although many schools have now reopened, online teaching and working remain common. Online working may lead to an increase in family-work conflict (Clark, 2000), and it may affect psychological well-being and behavior (Vaziri et al., 2020). According to the conservation of resources theory (Hobfoll, 1989), obtaining resources can help individuals to cope effectively with the demands of the external environment and to adapt psychologically; conversely, a loss of resources may cause mental health problems. In the case of work-family conflict, individuals may use up many of their resources to deal with the multiple, simultaneous tasks that arise from their work and family commitments (Grandey & Cropanzano, 1999). In addition, this can consume the cognitive and emotional resources needed to cope with trauma, thus making it difficult to deal with trauma-related cues and emotions. This can increase the severity of existing mental health problems. In line with this, empirical studies have shown that work-family conflict can directly aggravate mental health problems (Nordenmark et al., 2020; Zhou et al., 2020), and one study has found a positive association between work-family conflict and PTSS (Dillard, 2019). In the present study, we predicted that work-family conflict would be an important postdisaster factor in the development of PTSS during the COVID-19 pandemic.

Work-family conflict is an external environmental factor that affects mental health; however, its precise effect is determined by an individual's internal psychological state and cognitive processes. Of these, perceived stress is likely to be an important mediating factor. According to the conservation of resources theory (Hobfoll, 1989), a loss of resources makes individuals feel powerless when dealing with difficulties, and so they experience more stress. Several studies have supported this by demonstrating an increase in perceived stress in the presence of work-family conflict (Fotiadis et al., 2019; Obrenovic et al., 2020), which may result from the loss of coping resources (Grandey & Cropanzano, 1999). Another model, which extends the job demand-resources model (Schaufeli & Bakker, 2004), predicts that burnout and perceived stress increase when an individual's resources cannot meet demands. Such stress leads to a negative worldview and negative emotions, which in turn worsen PTSS (Pollice et al., 2012). This is supported by evidence that perceived stress can predict PTSS (Ginty et al., 2021; Keane, 1996). In this study, we hypothesized that work-family conflict would predict PTSS because it increases perceived stress following trauma.

Notably, the loss of resources caused by work-family conflict may result in unmet basic psychological needs (Van den Broeck et al., 2008; Van den Broeck et al., 2010). Roche and Haar (2010) pointed out that work-family conflict expends both time and energy, so that individuals find themselves unable to work effectively and freely fulfill their family commitments. This then hampers the satisfaction of their needs for autonomy and competence. Work-family conflict may also affect work and family relationships, leading to difficulties that

can result in an unmet need for relatedness. According to self-determination theory (Deci & Ryan, 2000), individuals are only motivated to achieve goals once their basic psychological needs have been satisfied (Ryan & Deci, 2000). These goals may include finding resources to deal with traumatic events and regulate emotions, which improves psychological outcomes (Auclair-Pilote et al., 2021). Unmet basic psychological needs trigger negative emotions (Wei et al., 2005) and lead to a reduced sense of control following trauma, which makes it harder to deal with traumatic events and regulate emotions; this may aggravate PTSS (Zhen et al., 2021). It is therefore possible that work-family conflict increases PTSS because of unmet basic psychological needs.

It seems likely that work-family conflict affects PTSS through an increase in perceived stress and unmet basic psychological needs, in accordance with the conservation of resources theory. However, drawing on the work-family conflict model of Greenhaus et al. (2006), Davis et al. (2017) proposed that work-family conflict may affect mental health by activating some cognitive processes, particularly rumination (Davis et al., 2017). They hypothesized that work-family conflict would induce a stress response (Davis et al., 2017) and lead to high arousal. This would then lead individuals to focus on stressful events and think about them repeatedly (Fryer & Warr, 1984). Such repetitive thoughts are considered a typical expression of rumination, and work-family conflict may increase the likelihood of rumination. Ruminating about stressful events leads individuals to focus on negative aspects of those events, and results in an increasingly negative view of the whole event (Ehlers & Clark, 2008). This may prompt individuals to form negative assumptions about the world during traumatic periods. This in turn maintains and increases negative thought patterns (Nolen-Hoeksema, 1991), leading to restlessness, nervousness, helplessness (Zhou et al., 2015), and many other psychological problems, which may eventually result in PTSS (Wang et al., 2020). We hypothesized that work-family conflict may aggravate PTSS during the COVID-19 pandemic by increasing rumination.

Perceived stress, unmet basic psychological needs, and rumination may all mediate the relationship between work-family conflict and PTSS. An important question is whether these three factors are related. The shattered assumptions theory (Janoff-Bulman, 2010) posits that stressful events associated with greater perceived pressure are more challenging to an individual's stable belief system. Therefore, stressful events may trigger an imbalance in the belief system. To alleviate this, individuals repeatedly think about the stressful event, which may lead to rumination (Janoff-Bulman, 2010; Quan et al., 2017). According to self-determination theory (Deci & Ryan, 2000), a stressful environment consumes an individual's psychological resources and can lead to unmet needs for autonomy, competence, and relatedness. Therefore, it is more difficult to satisfy psychological needs under conditions of greater perceived stress (Li et al., 2016; Raufelder et al., 2014). If these needs are not met, individuals focus more on their own needs than on the surroundings (Deci & Ryan, 2000; Wu et al., 2018) and pay more attention to stressors that impede the

satisfaction of their basic psychological needs. This increases the likelihood of repetitive thought patterns and, hence, rumination. Therefore, perceived stress may induce rumination either directly or indirectly, by impeding the satisfaction of psychological needs.

It is clear that different theories emphasize different factors regarding how work–family conflict affects psychological problems. Such theories are therefore somewhat limited and require integration to fully address this issue. Most empirical studies on work–family conflict were conducted before the COVID-19 pandemic; their findings may have been different if they had been carried out during the pandemic. For example, the increase in online working during the pandemic may lead to more complex work–family conflict, and individuals may be at greater risk of developing PTSS. It therefore remains to be determined whether previous findings also apply to the COVID-19 pandemic. More importantly, previous studies have seldom considered PTSS in teachers, which restricts our understanding of PTSS in this group. Greater understanding of this issue could guide attempts to alleviate teachers' psychological problems, which would be beneficial for their teaching work and indirectly affect their students' mental health. The aim of this study was to examine several potential mediators of the association between work–family conflict and PTSS: perceived stress, basic psychological needs, and rumination. We hypothesized that work–family conflict would aggravate PTSS through higher levels of perceived stress, unmet psychological needs, and rumination.

METHODS

Participants and procedures

The study was conducted from July 17, 2020, to September 28, 2020, during the COVID-19 outbreak, and was approved by the research ethics committee of the Department of Psychology and Behavioral Science, Zhejiang University. College teachers were recruited to complete an electronic questionnaire via WeChat (a free messaging and calling app widely used in China, version 8.0, procured by Xiao-long Zhang in Guangzhou province). An online questionnaire was used because of pandemic-related social distancing requirements. The purpose of the survey and the voluntary nature of participation were explained at the beginning of the questionnaire. The questionnaire also contained an electronic informed consent form, and no compensation was provided to participants. The questionnaire could be submitted only if all questions had been answered; therefore, questionnaire submission was deemed to constitute consent for study participation. According to the G*power result, 89 participants were sufficient for a linear multiple regression test. We recruited online for 1 week; a total of 274 college teachers finished it. Of these, 52.19% were men ($n = 143$) and 47.81% were women ($n = 131$); 21.53% were aged <30 years ($n = 59$) and 78.47% were aged >30 years ($n = 215$); 72.63% of the teachers were married ($n = 199$), 25.18% had never married ($n = 69$), and 2.19% were divorced

($n = 6$); 97.08% of teachers held a postgraduate degree ($n = 266$) and 2.92% held a bachelor's degree, but not a postgraduate degree ($n = 8$); 37.96% of teachers had taught for <5 years ($n = 104$) and 62.04% had taught for >5 years ($n = 170$). Of all participants, 16.42% reported that they, their relatives/acquaintances, or people in their community had been infected with COVID-19 ($n = 45$; 5 participants had had COVID-19), and 43.07% participants reported that they, their relatives/acquaintances, or people in their community had isolated during the pandemic ($n = 118$; 11 participants had self-isolated).

Measures

Pandemic exposure

We used a questionnaire developed by Zhen and Zhou (2020) to assess participants' exposure to the pandemic. The questionnaire comprises 10 items (e.g., "Has a member of your family been infected or been in quarantine?"); possible responses are *yes* (score = 2) or *no* (score = 1). Higher scores indicate a higher level of exposure to the COVID-19 pandemic.

Work–family conflict

We used the Work–Family Conflict Scale, translated into Chinese by Tong and Zhou (2009), to assess the level of work–family conflict. This 18-item scale is rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). This measure was found to exhibit good internal consistency, Cronbach's $\alpha = .94$, and acceptable construct validity, $\chi^2(119) = 565.861$, comparative fit index (CFI) = .892, Tucker–Lewis index (TLI) = .861, root-mean-square error of approximation (RMSEA) = .117, and standardized root-mean residual (SRMR) = .087, in this study.

Perceived stress

We used a Chinese perceived stress scale (Yang & Huang, 2003) to assess teachers' stress level. This measure comprises 14 items rated on a 5-point Likert scale ranging from 1 (*never*) to 5 (*always*). The scale showed good internal consistency, Cronbach's $\alpha = .95$, and construct validity, $\chi^2(68) = 179.044$, CFI = .962, TLI = .949, RMSEA = .077, and SRMR = .044, in this study.

Basic psychological needs

We used the Basic Psychological Needs Satisfaction Scale developed by Sheldon and Niemiec (2006) to assess college teachers' psychological needs. This nine-item measure assesses three psychological needs: autonomy, competence, and relatedness. All items are rated on a 6-point Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Previous studies

conducted during the COVID-19 pandemic have shown that this scale has good psychometric properties (Zhou & Yao, 2020), and it showed good internal consistency, Cronbach's $\alpha = .82$, and construct validity, $\chi^2(17) = 40.752$, CFI = .979, TLI = .955, RMSEA = .071, and SRMR = .033, in the present study.

Rumination

Teachers' rumination was assessed using the Rumination subscale of the Cognitive Emotion Regulation Questionnaire (Chinese version; Zhu et al., 2007). Responses to this four-item questionnaire are rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). This scale showed good internal consistency, Cronbach's $\alpha = .90$, and construct validity, $\chi^2(2) = 22.928$, CFI = .970, TLI = .909, RMSEA = .195, and SRMR = .026, in this study.

PTSS

PTSS was assessed using the PTSD Checklist (Zhou et al., 2017), a revised version of Weathers' (2013) PTSD Checklist for the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)*; American Psychiatric Association, 2013). The checklist contains 20 items with four subscales: Intrusion, Avoidance, Negative Cognitive and Emotional Alterations, and Hyperarousal symptoms. All items are rated on a 5-point Likert scale ranging from 0 (*strongly disagree*) to 4 (*strongly agree*). In this study, the scale exhibited good internal consistency, Cronbach's $\alpha = .97$, and construct validity, $\chi^2(153) = 583.604$, CFI = .921, TLI = .902, RMSEA = .101, and SRMR = .044. According to the *DSM-5* diagnostic criteria for PTSD (American Psychiatric Association, 2013), individuals who meet the following criteria are considered to have probable PTSD: (a) scores of ≥ 2 on at least one item of the Intrusion subscale, (b) scores of ≥ 2 on at least one item of the Avoidance subscale, (c) scores of ≥ 2 on at least two items of the Negative Cognitive and Emotional Alterations subscale, and (d) scores of ≥ 2 on at least two items of the Hyperarousal subscale.

Data analyses

Descriptive statistics were calculated for the main variables, and zero-order correlation analyses were conducted, controlling for pandemic exposure, gender, and age. Harman's single factor test was used to assess common method bias. The results showed that the first unrotated and rotated factors accounted for 30.59% and 17.94%, respectively, of the total variance. As the total of these was less than 40%, this indicated that there was no significant common method bias. A mediation analysis was run using Mplus Version 7.0 software (Muthén & Muthén, 2012) for work-family conflict and PTSS, with perceived stress, basic psychological needs, and rumination as mediator variables. Basic psychological needs and PTSS were

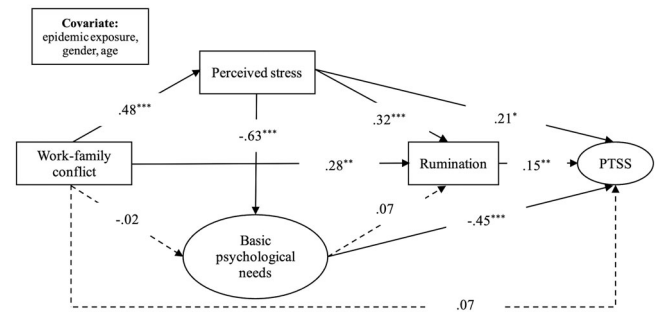


FIGURE 1 Model of indirect relationships between work-family conflict and posttraumatic stress disorder symptoms (PTSS) after controlling for pandemic exposure, gender, and age; ellipses represent latent variable, and rectangles represent observed variable.

latent, the other variables were observed (using total scores of each scale), and 5,000 bootstrap samples were extracted for the analysis (Figure 1). We used 95% confidence intervals (CIs) to examine the significance of the indirect paths in the model. A path was considered to be significant if the 95% CI did not include zero; conversely, if the 95% CI included zero, the path was considered nonsignificant. The chi-square *dfs*, the CFI, the TLI, the RMSEA, and the SRMR were used to evaluate the model fit. The cutoffs for these model indices were $\geq .90$ for the CFI and TLI, and $< .08$ for the RMSEA and SRMR.

RESULTS

Correlations between the main measures

The main aim of the study was to examine the relationship between the different variables in the context of the pandemic. Based on the diagnostic criteria, the prevalence of PTSD among teachers was 16.42%. Pearson zero-order correlations were calculated to examine the associations between main variables. The results are shown in Table 1. We found that teachers' exposure to the pandemic correlated significantly and positively with PTSS and its four symptoms, but not with the other variables. Work-family conflict showed a significantly positive correlation with perceived stress, rumination, and PTSS and its four symptoms; and a significantly negative correlation with three basic psychological needs and its total score. Perceived stress showed a significantly negative correlation with three basic psychological needs and its total score; and a significantly positive correlation with rumination as well as PTSS and its four symptoms. Three basic psychological needs and its total score showed a significantly negative correlation with rumination, and PTSS and its four symptoms; rumination showed a significantly positive correlation with PTSS and its four symptoms.

Indirect role of perceived stress, basic psychological needs, and rumination

For the indirect relationship analysis, we first examined the direct relationship of work-family conflict and PTSS,

TABLE 1 Means, SDs, and zero-order correlations for the main variables

Variable	M (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Epidemic exposure	12.10 (1.41)	1													
2. Work-family conflict	50.51 (12.74)	.11	1												
3. Perceived stress	38.56 (10.66)	.11	.49***	1											
4. Basic psychological needs	38.55 (7.05)	-.02	-.28**	-.58***	1										
5. Autonomy need	12.15 (2.64)	-.07	-.31***	-.54***	.86***	1									
6. Competence need	13.39 (2.81)	.03	-.14*	-.50***	.86***	.57***	1								
7. Relatedness need	13.01 (2.71)	-.02	-.29***	-.48***	.88***	.66***	.64***	1							
8. Rumination	11.65 (3.02)	.07	.41***	.41***	-.20**	-.21***	-.11	-.21***	1						
9. PTSS	18.43 (15.55)	.19**	.39***	.59***	-.56***	-.48***	-.44***	-.53***	.36***	1					
10. Intrusion	4.16 (3.91)	.19**	.33***	.49***	-.48***	-.41***	-.40***	-.44***	.31***	.94***	1				
11. Avoidance	1.71 (1.73)	.17**	.34***	.48***	-.46***	-.39***	-.38***	-.43***	.29***	.85***	.79***	1			
12. NCEA	6.41 (5.60)	.19**	.39***	.60***	-.58***	-.48***	-.44***	-.57***	.34***	.97***	.87***	.80***	1		
13. Hyperarousal	6.15 (5.19)	.16**	.38***	.60***	-.54***	-.48***	-.42***	-.51***	.39***	.96***	.85***	.76***	.90***	1	
14. Gender	1.47 (.50)	.05	-.05	-.05	.04	.06	.01	.03	.10	-.02	-.01	-.06	-.02	-.01	1
15. Age	3.42 (1.11)	.11	.02	.01	.05	.08	.05	.00	-.16**	.06	.06	.04	.09	.04	-.02

Notes: Correlations are partial zero-order correlations after controlling for epidemic exposure, gender, and age. Abbreviations: NCEA = negative cognitive and emotional alterations; PTSS = posttraumatic stress symptoms. * $p < .05$. ** $p < .01$. *** $p < .001$.

TABLE 2 Bias-corrected bootstrap tests for the indirect relationship

Paths from work–family conflict to PTSS	β	95% CI	
		Low	High
Direct path	.074	–.008	.163
Indirect via perceived stress	.103*	.036	.185
Indirect via basic psychological needs	.009	–.046	.068
Indirect via rumination	.042*	.018	.085
Indirect via perceived stress and basic psychological needs	.134***	.090	.193
Indirect via perceived stress and rumination	.023*	.009	.047
Indirect via basic psychological needs and rumination	.000	–.005	.001
Indirect via perceived stress, basic psychological needs, and rumination	–.003	–.013	.002

Note: We extracted 5,000 bootstrap samples.

Abbreviations: PTSS = posttraumatic stress symptoms; CI = confidence interval.

* $p < .05$. *** $p < .001$.

controlling for pandemic exposure, gender, and age. The model fit the data perfectly, $\chi^2(14) = 16.340$, CFI = .998, TLI = .997, RMSEA = .025, and SRMR = .014. This indicated that work–family conflict was significantly and positively associated with PTSS, $\beta = .38$, $p < .001$.

We then inserted perceived stress, basic psychological needs, and rumination into the path from work–family conflict to PTSS, and added paths from perceived stress to both basic psychological needs and rumination, and from basic psychological needs to rumination, thus creating a multiple indirect effects model. This model also fit the data perfectly, $\chi^2(43) = 88.550$, CFI = .977, TLI = .961, RMSEA = .062, and SRMR = .026. The analyses for the different paths showed that after controlling for pandemic exposure, gender, and age, work–family conflict was positively associated with perceived stress and rumination, $\beta = .48$, $p < .001$; $\beta = .28$, $p = .001$, respectively, but not basic psychological needs and PTSS, $\beta = -.02$, $p = .796$; $\beta = .07$, $p = .159$, respectively. Perceived stress was positively associated with rumination and PTSS, $\beta = .32$, $p < .001$; $\beta = .21$, $p = .013$, respectively, and negatively associated with basic psychological needs, $\beta = -.63$, $p < .001$. Basic psychological needs was negatively associated with PTSS, $\beta = -.45$, $p < .001$, but showed no significant relationship with rumination, $\beta = .07$, $p = .450$. Rumination was positively associated with PTSS, $\beta = .15$, $p = .003$. These findings indicated that perceived stress, basic psychological needs, and rumination played an indirect role in the relationship between work–family conflict and PTSS, after controlling for pandemic exposure, gender, and age.

To further examine the specific indirect role of perceived stress, basic psychological needs, and rumination, a bias-corrected bootstrap procedure was run (Table 2). The results showed that the CIs did not include zero for the paths from work–family conflict to PTSS via (a) perceived stress, (b) rumination, (c) perceived stress and basic psychological needs, and (d) perceived stress and rumination. The 95% CIs for the other indirect paths all included zero. These findings indicated that college teachers' work–family

conflict was associated with PTSS via the four paths mentioned earlier.

DISCUSSION

To the best of our knowledge, this is the first study to examine the indirect associations underlying the relationship between college teachers' work–family conflict and PTSS during the COVID-19 pandemic. Three indirect variables were investigated: perceived stress, basic psychological needs, and rumination. The results showed that after controlling for pandemic exposure, gender, and age, work–family conflict was associated with PTSS, in line with our hypothesis and supporting the conservation of resources theory (Hobfoll, 1989). This finding suggests that work–family conflict consumes people's resources (Grandey & Cropanzano, 1999), which makes it difficult for them to deal with trauma-related cues and emotions effectively, thus aggravating PTSS. However, the direct relationship was not significant when the three indirect variables were included in the analysis, indicating that the relationship of work–family conflict and PTSS was masked by perceived stress, basic psychological needs, and rumination. In other words, the association between work–family conflict and PTSS was completely explained by the multiple paths of these indirect variables, indicating the importance of perceived stress, basic psychological needs, and rumination.

A more detailed examination of the results shows that work–family conflict may exacerbate PTSS by increasing perceived stress, which is consistent with our hypothesis and the conservation of resources theory (Hobfoll, 1989). A possible reason for this relationship is that conflict between the multiple roles and tasks required by work and family life directly leads to more stress (Fotiadis et al., 2019; Obrenovic et al., 2020). This may consume an individual's resources (Grandey & Cropanzano, 1999), making it difficult for them to deal with the negative experiences caused by the pandemic, thus generating more stress. These high levels of stress may aggravate psychological reactions to trauma and lead to negative

assumptions about the world and negative emotions, which may worsen PTSS (Pollice et al., 2012).

The results also show that work–family conflict could also aggravate PTSS by increased perceived stress hindering the satisfaction of basic psychological needs and increase rumination. According to the conservation of resources theory (Hobfoll, 1989) and self-determination theory (Deci & Ryan, 2000), basic psychological needs may be unmet because perceived stress caused by work–family conflict consumes an individual's psychological resources so that they cannot be used to satisfy the need for autonomy, competence, and relatedness. This may lead an individual to experience negative emotions (Wei et al., 2005), a reduced sense of control over their lives, and difficulty coping with traumatic events and emotions, thus aggravating PTSS (Zhen et al., 2021). Regarding increased rumination, it is possible that perceived stress induces high arousal, prompting individuals to focus on stressful events and think about them repeatedly (Fryer & Warr, 1984), thus causing rumination and an increasingly negative view of these events (Ehlers & Clark, 2008). This may lead to negative assumptions about the world and could maintain and worsen preexisting negative cognition (Nolen-Hoeksema, 1991), thereby exacerbating PTSS.

Our results also show that work–family conflict may aggravate PTSS via rumination alone. This may be because our participants mainly worked online at home during the pandemic. The lengthy lockdowns probably increased work–family conflict, as the boundaries between work and family life blurred (Vaziri et al., 2020). This may have led teachers to repeatedly think about their work, their schedule, and other activities to effectively deal with the conflict. If they felt that they could not cope, these thoughts may have led them to focus on negative aspects, increased their negative evaluation of the situation (Ehlers & Clark, 2008), and intensified any negative reactions to trauma-related cues. This may have led to restlessness, nervousness, helplessness, and other problems (Zhou et al., 2015), and ultimately exacerbated PTSS.

Notably, not all the results supported our experimental hypotheses. Specifically, we found that work–family conflict was not associated with PTSS via the satisfaction of basic psychological needs alone or via the path from basic psychological needs to rumination. This may be because work–family conflict was not related to basic psychological needs. For example, despite experiencing work–family conflict, it is possible that teachers placed more value on their family life during the pandemic owing to worry or fear, which did not decrease their satisfaction with family life and relatedness need. Notably, the results also show that work–family conflict was not associated with PTSS via the path from perceived stress to basic psychological needs and then to rumination because the path from basic psychological needs to rumination was not significant. This finding may reflect the psychological influence of the pandemic on people's work and daily lives; this influence could lead to negative thinking and rumination, even though basic psychological needs are satisfied. This would explain why the path from basic psychological needs to rumination was not significant.

Several study limitations should be noted. First, the design was cross-sectional, so caution is needed before making assumptions about long-term effects and inferences about causality. Additional studies are needed using longitudinal study designs. Second, the study only included college teachers; it would be interesting to obtain data for primary and secondary school teachers. Finally, several factors may have affected college teachers' PTSS during the COVID-19 pandemic, but this study only considered work–family conflict, perceived stress, basic psychological needs, and rumination. It would be interesting to investigate the relationship of a wider range of factors to gain a deeper understanding of PTSS.

Despite these limitations, this is the first study to examine the indirect associations of work–family conflict and college teachers' PTSS, taking several relevant theories into consideration. We found that after controlling for pandemic exposure, gender, and age, work–family conflict was associated with PTSS via perceived stress alone, rumination alone, a path from perceived stress to basic psychological needs, and a path from perceived stress to rumination. These results clarified the indirect relationships of work–family conflict and PTSS in the context of trauma. The finding that both cognitive processes and motivation are involved provides a new perspective for further research. These findings also have important implications for mental health in the context of university education. Specifically, they highlight the importance of ensuring the mental health of college teachers during the pandemic, given the work–family conflict that can arise from online working. Measures could be taken to relieve stress, satisfy basic psychological needs, and reduce negative cognition to alleviate any psychological problems and enable teachers to adapt positively to the situation.

In conclusion, the present findings demonstrate that work–family conflict in college teachers during the COVID-19 pandemic is positively associated with PTSS via perceived stress and rumination alone, and via multiple paths from perceived stress to basic psychological needs and rumination. Perceived stress, rumination, and basic psychological needs may completely explain the relationship between work–family conflict and PTSS. This finding indicates that more attention should be paid to college teachers' perceived stress, basic psychological needs, and negative cognition to mitigate PTSS in the context of trauma.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available as supplemental materials in <https://osf.io/yjrsl>.

ETHICS STATEMENT

The study was approved by the research ethics committee of the Department of Psychology and Behavioral Science, Zhejiang University. All participants provided electronic informed consent form.

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