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Publication Date

2022-04-01

DOI

10.1007/s12144-022-03049-3

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Perceived parental support and college students' depressive symptoms during the COVID-19 pandemic: The mediating roles of emotion regulation strategies and resilience

Baojuan Ye¹ · Shunying Zhao¹ · Yadi Zeng¹ · Chuansheng Chen² · Yanzhen Zhang³

Accepted: 24 March 2022

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Abstract

The current study examined the mediating roles of emotion regulation strategies (i.e., cognitive reappraisal and expressive suppression) and resilience in the relationship between perceived parental support and depressive symptoms among college students during the first wave of the COVID-19 pandemic in China. A large sample of Chinese college students ($N = 2,423$) participated in this investigation. Results indicated that perceived parental support was negatively related to depressive symptoms. The two emotion regulation strategies and resilience partially and serially mediated the relation between perceived parental support and depressive symptoms. Theoretical and practical implications of these results are discussed.

Keywords Perceived parental support · Depressive symptoms · Emotion regulation strategies · Cognitive reappraisal strategy · Expressive suppression strategy · Resilience · The COVID-19 pandemic

Introduction

Previous studies have documented the negative effects of the ongoing COVID-19 pandemic on mental health among various groups (Cano et al., 2020; Escobar et al., 2020; Kaya et al., 2021; Ye et al., 2020a). One particularly vulnerable group is college students, who experienced disruptions to

their academic and social life on campus and were forced to move back home (Brooks et al., 2020). Studies have shown that the rate of depression among college students increased significantly during the pandemic (Wang et al., 2021; Wu et al., 2020). However, not all college students would experience depression during the pandemic (Drapkin et al., 2015; Scali et al., 2012). Therefore, it is important to identify protective factors against depression among college students during the COVID-19 pandemic, which may lead to targeted prevention and intervention programs.

An important protective factor against depression is family support. Given Chinese culture's emphasis on family relationships (Chao, 1994; Cheung & Pomerantz, 2011), perceived parental support should play a particularly important role in protecting Chinese college students from depressive symptoms during this pandemic. This study was designed to understand the role of perceived parental support in reducing depressive symptoms among Chinese college students during the pandemic. Based on the social support model (House et al., 1988) and the ecological systems theory (Bronfenbrenner & Ceci, 1994), the present study built a serial multiple mediation model to explore the roles of two specific mediating mechanisms—emotion regulation strategies and resilience—involved in the relation between perceived parental support and depressive symptoms among Chinese college students during the first wave of COVID-19.

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Emotion regulation is the process by which an individual changes the generation, expression, and intensity of emotions (Gross, 2015). Emotion regulation strategies can be either adaptive or maladaptive. Adaptive emotion regulatory strategies such as cognitive reappraisal help individuals reduce distress and negative emotion by generating positive interpretations of (or perspectives on) a stressful situation (Gross, 1998). Teaching individuals to use cognitive reappraisal skills has been found to protect them from depression (Beck et al., 1979). In contrast, maladaptive strategies such as expressive suppression are risk factors for depression (Gross, 1998; Nolen-Hoeksema et al., 2008).

Resilience refers to personal psychological traits such as tenacity, optimism, and strength that can help individuals to survive and even thrive in a negative situation (Connor & Davidson, 2003; Fergus & Zimmerman, 2005). Previous studies have specifically found that resilience can protect individuals from depression related to COVID-19 (Labrague & de Los Santos, 2020; Luceño-Moreno et al., 2020).

Thus far, however, little is known about the roles of emotion regulation strategies and resilience in the association between perceived parental support and depressive symptoms among college students. In the following sections, we briefly review the literature in support of the various links in our serial multiple mediation model.

Perceived Parental Support and Depressive Symptoms

According to the ecological systems theory (Bronfenbrenner & Ceci, 1994), perceived parental support is a component of the microsystem. Previous studies have shown that low parental support (or parental rejection or criticism) is a robust predictor of depression (Mezulis et al., 2006; Rapp et al., 2021; Young et al., 2005) and that low perceived parental support in childhood is a crucial antecedent factor of depression in adulthood (Lancaster et al., 2007). Although the relation between perceived parental support and depressive symptoms has been well-documented, no study has explored whether and how perceived parental support can influence Chinese college students' depression during the COVID-19 pandemic.

The Mediating Roles of Emotion Regulation Strategies

The triadic model of family processes (Schleider & Weisz, 2017) posits that parenting style affects children's internalizing problems by shaping their emotional regulation skills. Studies in China also showed that perceived parental support helps individuals to develop more adaptive emotion regulation strategies (Hu et al., 2017; Zhan & Wu, 2016). As mentioned earlier, two commonly used emotion regulation

strategies are cognitive reappraisal and expressive suppression (Gross, 2001; Wang & Guo, 2003). Cognitive reappraisal is an adaptive strategy that changes individuals' perspectives on a given situation so as to have positive emotional impact (Cano et al., 2020). Parental support allows children to express their emotions and hence to promote emotional communication with their parents. From such communications children can learn to take multiple perspectives and to use cognitive reappraisal strategies when coping with stress. Expressive suppression is a maladaptive strategy that decreases behavioral expression of emotions (Chen et al., 2016, 2019; Goldin et al., 2008; Gross, 2001). This strategy is used by individuals who lack parental warmth and support to avoid punishment and rejection (Ogbasele et al., 2020).

Many studies have further linked emotion regulation strategies to depression (Diedrich et al., 2017; Sun et al., 2020). As an adaptive strategy, cognitive reappraisal can help reduce negative emotions and improve mental health (Chen et al., 2019). In contrast, as a negative emotion regulation strategy, expressive suppression leads to emotion-related physiological problems and depression (Gross & John, 2003).

Although previous studies have linked family factors to emotion regulation strategies and linked such strategies to depressive symptoms, no study has built a multiple mediation model. In our model, we hypothesized that high perceived parental support would lead to the adoption of adaptive strategies such as cognitive appraisal and the avoidance of maladaptive strategies such as expressive suppression, which would in turn lead to fewer depressive symptoms during the COVID-19 pandemic.

The Mediating Role of Resilience

Resilience or the adaptive ability to cope with adversities or traumas (Poole et al., 2017) is another potential mediator of the relation between perceived parental support and depressive symptoms. According to the dynamic model of mental resilience (Lu et al., 2020; WCDE, 2021), positive family factors promote mental health by improving individuals' resilience. Several previous studies have shown that family factors are associated with resilience (Daniels and Bryan, 2021; Huang & Jing, 2011; Rutter, 1985; Tan et al., 2009). For example, Tan et al. (2009) found that individuals with high resilience reported more support from their family members. Huang and Jing (2011) also found that perceived parental support was positively associated with resilience for individuals from low economic status families.

Studies have also demonstrated the protective effect of resilience against depression. For example, Liu et al. (2019) found that high school students with stronger resilience had a lower level of depression resulting from the stress of

negative events. Poole et al. (2017) found that resilience contributed to the mental health of adults who experienced abuse in childhood. Most recently, two studies of health-care staff and college students showed that individuals with stronger resilience experienced lower depression during the COVID-19 pandemic than did those with weaker resilience (Labrague & de Los Santos, 2020; Luceño-Moreno et al., 2020).

Finally, several empirical studies have specifically found that resilience is a mediating variable between family factors and depression (Moon et al., 2017; Nam et al., 2016). However, no study has directly examined the mediating effect of resilience on the relation between perceived parental support and depressive symptoms during the COVID-19 pandemic. We hypothesized that perceived parental support would be positively correlated with Chinese college students' resilience, which in turn would be negatively correlated with depressive symptoms.

Emotion Regulation Strategies and Resilience as Serial Mediators

The discussion above treated emotion regulation strategies and resilience as parallel mediators of the relation between perceived parental support and depression. However, they may be serial mediators. Previous research suggests that positive emotional regulation strategies like cognitive reappraisal can protect individuals from depression by improving resilience (Mestre et al., 2017; Young et al., 2019). Other studies also found that the ability to manage or regulate emotion is a critical factor for resilience (Troy & Mauss, 2011). Therefore, emotion regulation strategies and resilience may operate as serial as well as parallel mediators. Taken together these lines of literature, we hypothesized that cognitive reappraisal would be positively associated with resilience, whereas expressive suppression would be negatively associated with resilience, and that they would play a serial mediation role in the relation between perceived parental

support and depressive symptoms (see specific hypotheses below).

The Present Study

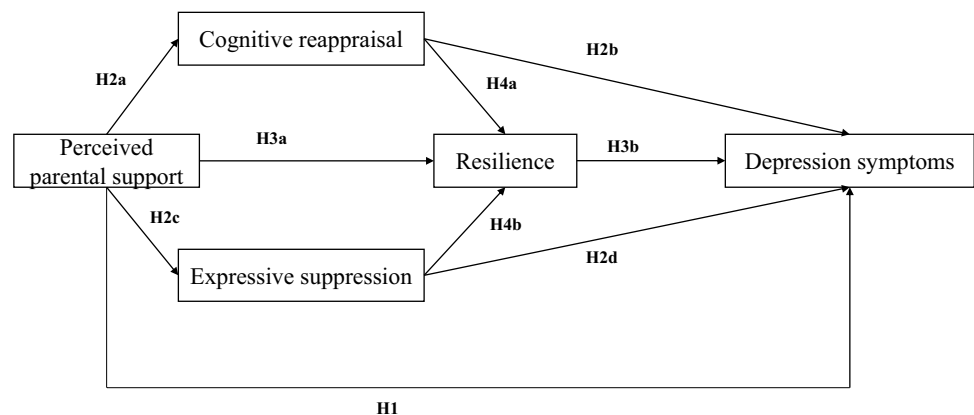
During the time of the data collection for this study (March 16 to 28, 2020), China was the country with the worst outbreak of COVID-19 in the world. As of March 16, 2020, the number of confirmed COVID-19 cases in China was 81,077 (People's Daily, 2020). At that time, medical experts still lacked sufficient knowledge about this new virus and were at the initial stage of exploring treatment, prevention, and control measures. With no vaccine and only limited medical capacity to treat the disease, non-pharmaceutical interventions such as social distancing were the main strategies to contain the pandemic (Gössling et al., 2020). Consequently, Chinese college students were required to stay at home and engage in remote learning during the first wave of the COVID-19 outbreak (Zhang et al., 2021). As mentioned earlier, they have been found to be particularly prone to developing depressive symptoms during the COVID-19 pandemic (Wang et al., 2021; Zhang et al., 2020b; Zhang et al., 2021). This situation provided an unusual opportunity to examine the role of perceived parental support, emotion regulation strategies, and resilience in depressive symptoms.

We tested our multiple serial mediation model (see Fig. 1) in the following steps. First, we tested whether perceived parental support had a strong negative link to depressive symptoms among Chinese college students isolated at home during the COVID-19 pandemic. Second, we examined whether emotion regulation strategies (i.e., cognitive reappraisal and expressive suppression) and resilience acted as serial mediators of this relationship. This study tested the following four specific hypotheses:

Hypothesis 1. Perceived parental support is negatively related to depressive symptoms.

Hypothesis 2. Emotion regulation strategies mediate the relationship between perceived parental support and

Fig. 1 Proposed mediation model



depressive symptoms. Specifically, perceived parental support is positively related to cognitive reappraisal (Hypothesis 2a), which is in turn negatively linked to depressive symptoms (Hypothesis 2b). Perceived parental support is negatively related to expressive suppression (Hypothesis 2c), which is in turn positively associated with depressive symptoms (Hypothesis 2d).

Hypothesis 3. Resilience mediates the relationship between perceived parental support and depressive symptoms. Specifically, perceived parental support is positively correlated with resilience (Hypothesis 3a), which in turn is negatively correlated with depressive symptoms (Hypothesis 3b).

Hypothesis 4. The two paths from emotion regulation strategies to resilience (a positive path from cognitive reappraisal to resilience [Hypothesis 4a] and a negative path from expressive suppression to resilience [Hypothesis 4b]) mediate the link between perceived parental support and depressive symptoms.

Method

Participants

A total of 2423 college students from mainland China ($M_{\text{age}} = 20.44$, $SD_{\text{age}} = 1.60$, $\text{range}_{\text{age}} = 18\text{--}25$; 77.7% female; 44.1% 1st year, 22.8% 2nd year, 18.8% 3rd year, and 14.3% 4th year) completed the following measures anonymously: demographic information, perceived parental support scale, emotion regulation questionnaire, Connor-Davidson Resilience Scale, and the Center for Epidemiologic Studies Depression scale. The Research Ethics Committee of the first author's institution approved the current investigation. We distributed questionnaires electronically via Survey Star (Changsha Ranxing Science and Technology, Shanghai, China) from March 16 to March 28, 2020. Before data collection, participants signed informed consent and were free to withdraw from the investigation at any time. Participation in this study was entirely voluntary and without compensation.

Measures

Perceived Parental Support

Perceived parental support was measured using a scale developed by Fan et al. (2018). Participants rated 8 items (e.g., "When I am faced with difficulties, I get help from my parents") on a 5-point Likert-type scale (1 = Rarely, 5 = Usually). Higher mean scores indicated higher levels of perceived parental support. This scale has shown good reliability and validity among Chinese participants (Xiang

et al., 2019). In our study, Cronbach's α was 0.954, and CFA showed acceptable fit for this scale, $\text{CFI} = 0.990$, $\text{TLI} = 0.979$, $\text{SRMR} = 0.015$, $\text{RMSEA} = 0.075$.

Emotion Regulation Strategies

Emotion regulation strategies were measured by the Chinese version (Wang et al., 2020) of Gross and John's (2003) emotion regulation questionnaire. Participants rated 10 items on a 7-point Likert scale (1 = Strongly disagree, 7 = Strongly agree) assessing two dimensions: 1) cognitive reappraisal with 6 items (e.g., "I control my emotions by changing the way I think about the situation I'm in"), and 2) expressive suppression with 4 items (e.g., "I keep my emotions to myself"). Higher scores indicated stronger endorsement of those strategies. This scale has shown good reliability and validity among Chinese participants (Wang et al., 2020; Zhao et al., 2017). In our study, Cronbach's α was 0.847 for cognitive reappraisal and 0.757 for expressive suppression, and CFA showed acceptable fit for this two-factor scale, $\text{CFI} = 0.956$, $\text{TLI} = 0.940$, $\text{SRMR} = 0.032$, $\text{RMSEA} = 0.067$.

Resilience

Resilience was measured using Connor-Davidson Resilience Scale (Campbell-Sills & Stein, 2007; Wang et al., 2010). The scale was composed of ten items (e.g., "I am not easily defeated by failure") on a 5-point Likert-type scale (1 = Never, 5 = Always). Higher mean scores indicated higher levels of resilience. This scale has shown good reliability and validity among Chinese participants (Wu et al., 2021a). In our study, Cronbach's α was 0.926 and CFA showed acceptable fit for this scale, $\text{CFI} = 0.967$, $\text{TLI} = 0.956$, $\text{SRMR} = 0.027$, $\text{RMSEA} = 0.077$.

Depressive Symptoms

Depressive symptoms were measured by the Chinese version of the Center for Epidemiologic Studies Depression Scale (Radloff, 1977; Wang et al., 1999). Participants rated 20 items on a 4-point Likert-type scale (1 = Rarely or none of the time, 4 = Most or all of the time) assessing four dimensions: (1) depressed mood (e.g., "I felt depressed"), (2) positive affect (e.g., "I was happy"), (3) psychosomatic complaints (e.g., "I had trouble keeping my mind on what I was doing"), and (4) interpersonal problems (e.g., "I felt that people dislike me"). The items for the positive affect subscale were reverse-coded. Higher mean scores indicated higher levels of depressive symptoms. This scale has shown good reliability and validity among Chinese participants (Wu et al., 2021b; Zhang et al., 2020a; Zhang et al., 2010). For this study, Cronbach's α was 0.929 and CFA

showed acceptable fit for this four-factor scale, CFI=0.927, TLI=0.915, SRMR=0.039, RMSEA=0.069.

Data Analysis

First, we obtained descriptive statistics and Pearson correlations of the study variables. Second, we examined the mediating effects of emotion regulation strategies and resilience using the PROCESS macro for SPSS (Model 80) (Hayes, 2017). Third, the bootstrap confidence intervals (CIs) were used to determine whether the effects in Model 80 were significant based on 5000 random samples (Hayes, 2017). If the CIs did not include zero, there was a significant effect. All study variables were standardized in Model 80 before data analyses.

Results

Preliminary Analyses

Table 1 shows the means and SDs of the key study variables and their Pearson correlations. Gender was negatively correlated with expressive suppression and resilience. Perceived parental support was positively correlated with cognitive reappraisal and resilience but negatively correlated with expressive suppression. Most importantly, perceived parental support was negatively correlated with depressive symptoms, which supported Hypothesis 1. Cognitive reappraisal was positively correlated with expressive suppression and resilience but negatively correlated with depressive symptoms. Expressive suppression was positively correlated with depressive symptoms. Resilience was negatively correlated with depressive symptoms.

The Mediating Effects of Emotion Regulation Strategies and Resilience

Figure 1 shows the results of the serial mediation model. Because gender was significantly associated with some of the variables, it was included as a control variable. Perceived parental support had a significant positive

path to cognitive reappraisal (supporting Hypothesis 2a) ($\beta=0.199, t=10.003, p<0.001$) and a significant negative path to expressive suppression (supporting Hypothesis 2c) ($\beta=-0.110, t=-5.490, p<0.001$), both of which in turn had significant paths to depressive symptoms (supporting Hypothesis 2b, $\beta=-0.120, t=-6.713, p<0.001$; and Hypothesis 2d, $\beta=0.249, t=14.826, p<0.001$). Perceived parental support also had a significant positive path to resilience (supporting Hypothesis 3a) ($\beta=0.253, t=13.636, p<0.001$), which in turn had a significant negative path to depressive symptoms (supporting Hypothesis 3b) ($\beta=-0.349, t=-19.109, p<0.001$). Finally, cognitive reappraisal had a significant positive path to resilience (supporting Hypothesis 4a) ($\beta=-0.331, t=17.611, p<0.001$) and expressive suppression had a significant negative path to resilience (supporting Hypothesis 4b) ($\beta=-0.062, t=-3.316, p<0.001$).

As presented in Table 2, the direct effect of perceived parental support on depressive symptoms was significant ($\beta=-0.262, 95\% \text{ CI}=-0.296 \text{ to } -0.229$). The mediation effects of cognitive reappraisal and expressive suppression on depressive symptoms were significant (respectively, $\beta=-0.024, 95\% \text{ CI}=-0.034 \text{ to } -0.015$; $\beta=-0.027, 95\% \text{ CI}=-0.040 \text{ to } -0.016$). The mediation effect of resilience on depressive symptoms was significant ($\beta=-0.088, 95\% \text{ CI}=-0.108 \text{ to } -0.070$). Finally, the indirect effects

Table 2 Standardized direct and indirect effects for the model

Model pathways	Estimated	95%-confidence interval	
		Lower	Upper
Direct effect			
PPS-DS	-0.262	-0.296	-0.229
Indirect effects			
PPS-CR-DS	-0.024	-0.034	-0.015
PPS-ES-DS	-0.027	-0.040	-0.016
PPS-Resilience-DS	-0.088	-0.107	-0.070
PPS-CR-Resilience-DS	-0.023	-0.030	-0.017
PPS-ES-Resilience-DS	-0.002	-0.004	-0.007

N=2423, PPS=Perceived parental support, DS=Depressive symptoms, CR=Cognitive reappraisal, ES=Expressive suppression

Table 1 Means, standard deviations, and correlations of the main study variables

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Gender	-	-	-					
2. Perceived parental support	3.918	0.831	-0.012	-				
3. Cognitive reappraisal	4.673	0.834	0.027	0.199***	-			
4. Expressive suppression	3.930	0.948	-0.124***	-0.109***	0.197***	-		
5. Resilience	3.612	0.599	-0.125***	0.327***	0.366***	-0.007	-	
6. Depressive symptoms	1.783	0.448	-0.009	-0.427***	-0.252***	0.259***	-0.478***	-

N=2423, gender is a dummy variable, with male=0 and female=1, ****p*<0.001

of cognitive reappraisal, expressive suppression, and resilience as serial mediators in the relation between perceived parental support and depressive symptoms were significant. Specifically, both of the paths of parental support → cognitive reappraisal → resilience → depressive symptoms ($\beta = -0.023$, 95% CI = -0.030 to -0.017) and parental support → expressive suppression → resilience → depressive symptoms ($\beta = -0.002$, 95% CI = -0.005 to -0.007) were significant (Fig. 2).

Alternative Mediation Models

During the review process, one reviewer suggested that we should test alternative mediation models because we used cross-sectional data. We then tested three alternative models (Figs. 3, 4, 5) using the PROCESS macro for SPSS (Model 80 and Model 81) (Hayes, 2017).

For alternative model I, the direct effect of perceived parental support on depressive symptoms was significant ($\beta = -0.262$, 95% CI = -0.296 to -0.229). The mediation effect of resilience on depressive symptoms was significant ($\beta = -0.114$, 95% CI = -0.135 to -0.093). The mediation effects of cognitive reappraisal and expressive suppression

on depressive symptoms were significant (respectively, $\beta = -0.010$, 95% CI = -0.017 to -0.005 ; $\beta = -0.029$, 95% CI = -0.041 to -0.017). Finally, the path of parental support → resilience → cognitive reappraisal → depressive symptoms was significant ($\beta = -0.014$, 95% CI = -0.019 to -0.009), while the path of parental support → resilience → expressive suppression → depressive symptoms ($\beta = 0.001$, 95% CI = -0.003 to 0.006) was not significant.

For alternative model II, the direct effect of depressive symptoms on perceived parental support was significant ($\beta = -0.333$, 95% CI = -0.375 to -0.290). The mediation effect of cognitive reappraisal on perceived parental support was significant ($\beta = -0.018$, 95% CI = -0.029 to -0.008). However, the mediation effect of expressive suppression on perceived parental support was not significant ($\beta = -0.009$, 95% CI = -0.020 to 0.001). The mediation effect of resilience on perceived parental support was significant ($\beta = -0.060$, 95% CI = -0.083 to -0.039). Finally, the path of depressive symptoms → cognitive reappraisal → resilience → parental support was significant ($\beta = -0.009$, 95% CI = -0.013 to -0.006), while the path of depressive symptoms → expressive suppression → resilience → parental support was not significant ($\beta = 0.001$, 95% CI = -0.0001 to -0.003).

Fig. 2 Results of multiple serial mediation analysis

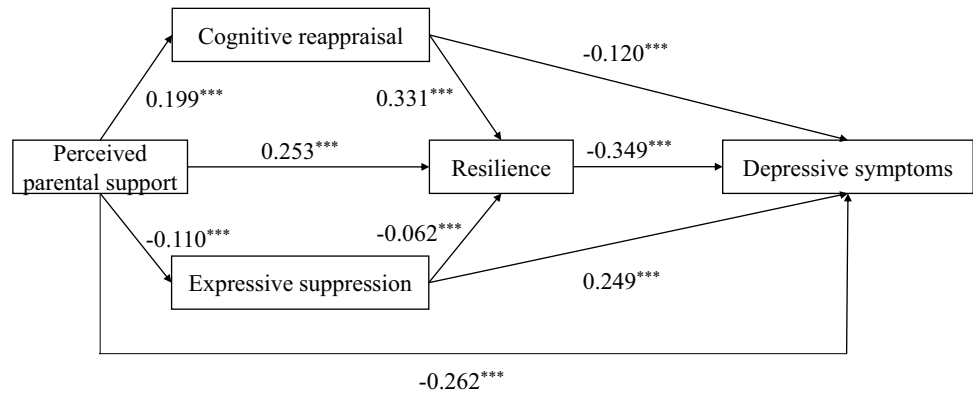


Fig. 3 Alternative model I

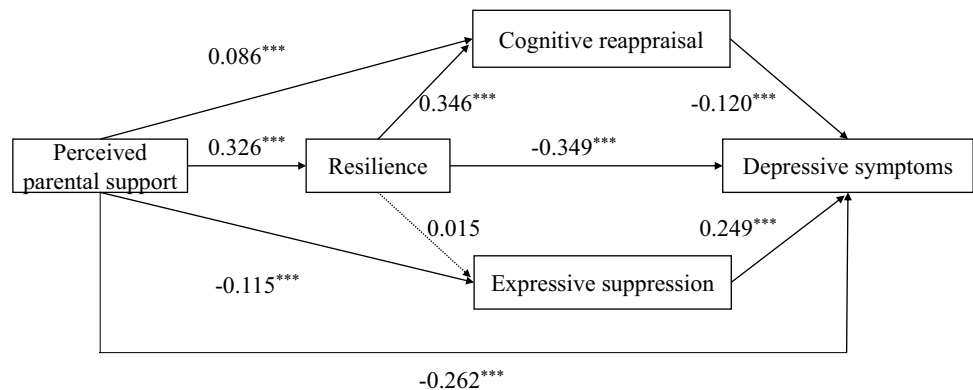


Fig. 4 Alternative model II

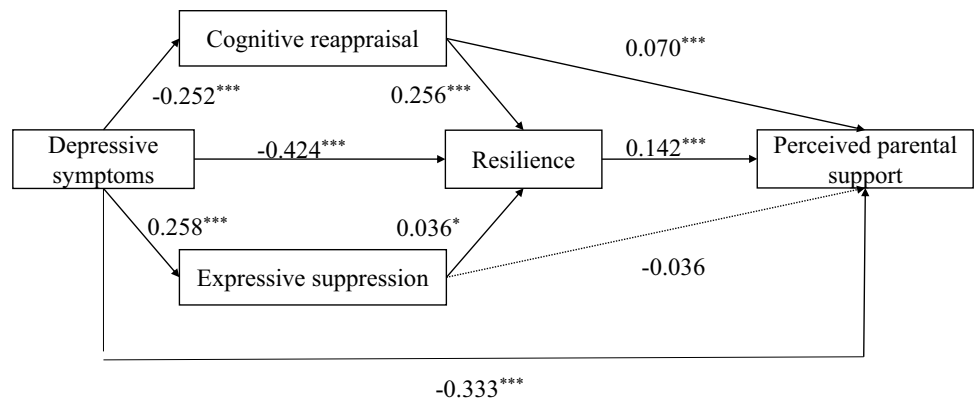
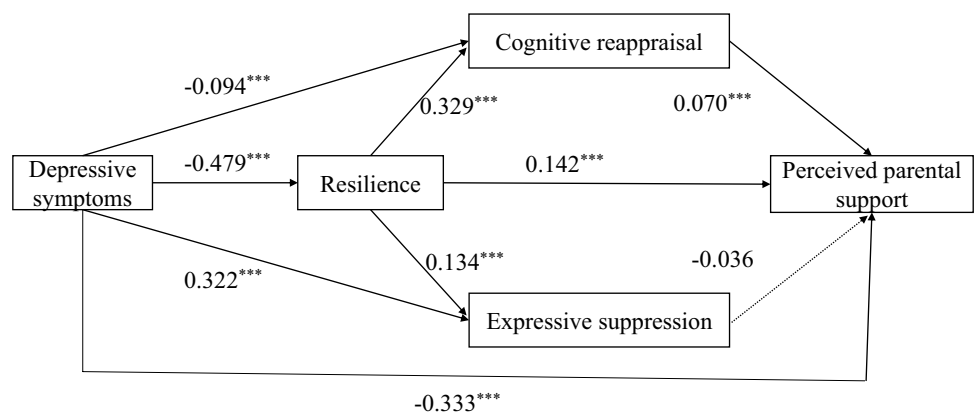


Fig. 5 Alternative model III



For alternative model III, the direct effect of depressive symptoms on perceived parental support was significant ($\beta = -0.333$, 95% CI = -0.375 to -0.290). The mediation effect of resilience on perceived parental support was significant ($\beta = -0.068$, 95% CI = -0.093 to -0.043). The mediation effect of cognitive reappraisal on perceived parental support was significant ($\beta = -0.007$, 95% CI = -0.012 to -0.002). However, the mediation effect of expressive suppression on perceived parental support was not significant ($\beta = -0.012$, 95% CI = -0.025 to 0.002). Finally, the path of depressive symptoms \rightarrow resilience \rightarrow cognitive reappraisal \rightarrow parental support was significant ($\beta = -0.011$, 95% CI = -0.018 to -0.005), while the path of depressive symptoms \rightarrow resilience \rightarrow expressive suppression \rightarrow parental support was not significant ($\beta = 0.002$, 95% CI = -0.0003 to 0.005).

Discussion

To the best of our knowledge, this is the first study to focus on the link between perceived parental support and depressive symptoms among college students who stayed at home and engaged in remote learning during the first wave of

COVID-19. Our multiple serial mediation model examined the roles of emotion regulation strategies (i.e., cognitive reappraisal and expressive suppression) and resilience as the underlying psychological mechanisms connecting parental support to college students' depressive symptoms. First, perceived parental support was negatively related to depressive symptoms. Second, emotional regulation strategies (e.g., cognitive reappraisal, expressive suppression) and resilience independently mediated the association between perceived parental support and depressive symptoms. Third, cognitive reappraisal was positively related to resilience while expressive suppression was negatively related to resilience, indicating that they played multiple serial mediating roles in the relationship between perceived parental support and depressive symptoms. Our results indicate that perceived parental support is a protective factor that can help to reduce college students' depressive symptoms significantly and that the underlying mechanisms involve emotional regulation strategies and resilience. These results help us to understand the psychological processes of how perceived parental support can reduce mental health problems such as depression among college students during public health crises and provide valuable insights for prevention and intervention.

Perceived Parental Support and Depressive Symptoms

The results showed that perceived parental support was significantly and negatively associated with depressive symptoms, which is consistent with previous studies (Burns et al., 2015; Eckshtain et al., 2010; Macalli et al., 2020). According to interpersonal relationship theory, individuals with low social support tend to experience depression when they have been exposed to stressful events for a long time (Stewart & Harkness, 2017). As an important psychological resource for individuals (Chan & Wong, 2020), perceived parental support helps individuals to reduce depression and maintain mental health (Johnson-Esparza et al., 2021). In China, family plays a crucial role in an individual's development and family harmony is believed to be the prerequisite of success and wealth (Ye et al., 2019). Consequently, family factors (e.g., parental support) may have a more enduring effect on individuals' depressive symptoms in China than in Western countries.

The Mediating Roles of Emotion Regulation Strategies

Because higher perceived parental support can reduce depressive symptoms as found in this study and others (e.g., Rapp et al., 2021), it would seem to suggest that family interventions be adopted to increase parental support. However, family interventions often encounter various difficulties such as parents' lack of enthusiasm. Consequently, it is necessary to explore mediating factors that are modifiable via intervention. This study examined the mediation effects of emotion regulation strategies and resilience, which can be developed by working directly with the students. Our results showed that both cognitive reappraisal and expressive suppression mediated the relation between perceived parental support and depressive symptoms. They are consistent with the literature that perceived parental support helps individuals to develop adaptive emotion regulation strategies such as cognitive reappraisal and to avoid maladaptive strategies such as expressive suppression (Lancaster et al., 2007; Liu et al., 2017). Our results delineated the processes through which high perceived parental support can alleviate depressive symptoms by helping individuals to develop and use cognitive reappraisal more frequently and expressive suppression less frequently. These parents probably create a family atmosphere that encourages their children to actively express their emotions and are likely to be good at detecting their children's negative emotions (Morris et al., 2017). It should be mentioned that, in addition to parental support, parents may also help their children to develop adaptive emotion regulation strategies through other mechanisms like serving as role models (Bandura & Walters, 1977).

The Mediating Role of Resilience

We also found that resilience mediated the relation between perceived parental support and depressive symptoms. This result is in line with the relationship model of mental diathesis and health (Wang & Zhang, 2012), which states that external protective factors (e.g., perceived parental support) reduce individuals' risk of psychological distress (e.g., depression) by increasing their internal psychological resources (e.g., resilience) (Nam et al., 2016; Shen et al., 2020). Parental support can help individuals to become more confident and feel stronger in the face of difficulties, thereby promoting resilience. Parental support can also lead individuals to experience more positive emotions even in stressful situations, which helps them to withstand stress and to increase resilience (Lei et al., 2011; Ye et al., 2020b). Resilience has been found to help individuals of all ages to cope with depression (Ávila et al., 2018; Niu et al., 2016; Waugh et al., 2008; Wu et al., 2017; Zhou et al., 2016).

Emotion Regulation Strategies and Resilience as Serial Mediators

Our results showed that cognitive reappraisal was positively correlated with resilience, while expressive suppression was negatively correlated with resilience. These results are consistent with previous studies (Mouatsou & Koutra, 2021; Zarotti et al., 2020). Cognitive reappraisal can help individuals significantly reduce negative emotional experiences and increase positive emotions (Cai et al., 2018; López-Valle et al., 2018), while expressive suppression does the opposite (Dryman & Heimberg, 2018). As a result, individuals who use cognitive reappraisal show higher resilience, whereas individuals who use expressive suppression show lower resilience (Richards & Gross, 2000).

Limitations and Future Directions

Several limitations of the current study must be considered. First, this was a cross-sectional study, which prevents us from drawing causal conclusions. Future studies should use longitudinal data to directly test the temporal sequence of the paths in our model and compare alternative models. Second, all variables included in this study were measured via self-report scales, which are subject to socially desirable responding bias and common method bias. For topics like depression, participants may intentionally conceal and underreport their actual symptoms, and for topics like parental support, participants may over-report their levels, especially due to Chinese culture's emphasis on family harmony. Future studies should collect data from objective sources or

at least multiple informants (e.g., friends, teachers, family members). Third, this study did not consider the potential roles of factors such as socioeconomic status, living arrangement, and COVID-19 infection status. Finally, the sample used in this study was Chinese college students, limiting the generalizability of findings across diverse cultures, especially Western cultures where college students' family relationships may be less important than peer relationships.

Practical Implications

Despite these limitations, the current study contributes to the literature by providing a conceptual basis for designing social interventions to help Chinese college students with depressive symptoms. First, this paper illustrates the importance of parental support in the use of adaptive emotion regulation strategies (e.g., cognitive reappraisal) and resilience in alleviating depression during a public health crisis. Therefore, mental health intervention and prevention programs for Chinese college students should target the family system and utilize strategies to promote family harmony (Horowitz & Garber, 2006). Parents should be encouraged to express psychological support more frequently to their children during this challenging period. Second, our results also suggest that intervention and prevention programs can target the mediators, including cognitive reappraisal strategy and resilience. Given that many of the successful depression intervention programs are highly manualized and conducted in schools (Horowitz & Garber, 2006), teachers and school counselors are uniquely positioned to teach cognitive reappraisal strategies and coach resilience to college students. Third, extrapolating our results from parental support to other sources of social support (e.g., institutions and organizations), we suggest that universities should actively provide support to those who lack parental support to help to develop adaptive emotional regulation strategies like cognitive reappraisal, to reduce the use of maladaptive strategies such as suppressing emotions, and to strengthen resilience, and consequently to reduce depression.

Conclusion

The present study found that perceived parental support helped Chinese college students to reduce depressive symptoms during the COVID-19 pandemic period. This effect was partially and serially mediated by emotion regulation strategies and resilience. The study helps us to understand the mechanisms between perceived parental support and depression and guides intervention programs aimed at

reducing depression during public health crises such as the COVID-19 pandemic.

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