


COVID-19 Stressful Life Events and Chinese Adolescents' Mental Health: Examining Resilience, Peer Relationship, and Parenting as Moderators

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Abstract

The current study examines intrapersonal characteristics or factors (i.e., resilience), peer (i.e., quality of peer relationships), and family processes (i.e., parental involvement, critical comparison) as potential risk and protective factors for mental health of Chinese adolescents during COVID-19 pandemic. A total of 504 seventh-grade students (52% boys) and their caregivers in Beijing, China completed an online survey in September 2020. Youth reported experiencing various COVID-19-related stressful life events (i.e., conflicts with parents, poor learning environment and efficiency, family financial pressure), and about 15% reported slightly elevated scores of mental health difficulties. Findings suggested personal resilience and quality of peer

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relationship predicted positive mental health (i.e., covitality or co-occurrence of positive psychological dispositions) and less mental health difficulties. Parent's critical comparison intensified the negative link between stressful life events and youth mental health. Implications for promoting youth mental health as schools reopen are discussed.

Keywords

covitality, mental health difficulties, resilience, peer relationships, parenting

COVID-19 pandemic has negatively impacted the life of many youth and families globally. Youth experience many stressful life events during the COVID-19, such as school closure, difficulties with virtual learning, and isolation from family and friends, which negatively affect their mental health (Magson et al., 2021; Ye et al., 2021; Zhou et al., 2020). Moreover, COVID-19 may make transition to middle school more challenging for new seventh graders (seventh graders are first-year middle school students in China). Studies have shown that middle school transition can be challenging to many students (e.g., Rudolph et al., 2001) as these new students face a range of demands associated with high academic expectations, learn new strategies, and make new friends. Without sufficient coping strategies for these significant changes, new middle school students are more likely to feel stressed out and have a lower level of self-concept and self-esteem (Onetti et al., 2019). While pre-pandemic studies on the buffering role of social support from family and friends against negative life events have been well established (Rueger et al., 2016), pandemic has challenged adolescents' access to such social support due to physical distancing and has changed the quality of parent-child relationships at home (Schmidt et al., 2020).

Existing studies during COVID-19 have mainly focused on mental health difficulties, yet it is also important to examine the positive constructs of mental health. In counter to the term, "comorbidity" or co-occurrence of multiple psychological disorders, researchers in positive psychology introduced the construct of covitality to capture the co-occurrence of positive psychological strengths and overall socioemotional wellbeing/thriving (Furlong et al., 2018). Covitality is coined to describe youth's capacity for living a life with meaning and purpose and is defined as the "synergistic effect of positive mental health resulting from the interplay among multiple positive psychological building blocks" (Furlong et al., 2014a, p. 2). Covitality is a higher-order factor, encompassing four socioemotional health domains of youth's belief in self, belief in others, emotional competence, and engaged living that have shown to facilitate positive youth development, such as better academic engagement and greater life satisfaction (Furlong et al., 2021). Covitality has shown to be

related to other positive mental health constructs, such as life satisfaction and positive affect, and negatively related to mental health difficulties, such as negative affect and depression (Furlong et al., 2014b).

We focus on covitality because COVID-19 challenges youth's abilities to live a positive and meaningful life. Therefore, the current study examines intrapersonal (i.e., resilience), peer (i.e., quality of peer relationships), and family processes (i.e., parental involvement in learning, parental comparison) as potential risk and protective factors for mental health of adolescents in China during COVID-19 pandemic.

Theoretical Framework: Process-Person-Context-Time Model

Based on the *Process-Person-Context-Time Model* of Bronfenbrenner's biocological framework (Bronfenbrenner & Morris, 2006), the interplay of four interconnected components predicts youth development: (a) interactions with immediate environment (e.g., family, peer, school) often called proximal processes, (b) intrapersonal characteristics, (c) broader social context, and (d) changes over time. The proximal processes serve as primary mechanisms for youth development, yet a disruption or dysfunction in the proximal processes, referred as inverse proximal processes (e.g., stressful life events during COVID-19, hostile peer or parent-child interactions; (Merçon-Vargas et al., 2020), can have negative impacts on healthy youth development. The current study examines inverse proximal processes on Chinese middle-school students' mental health (both positive psychological traits and mental health difficulties) immediately after a long period of school closure and home confinement. During COVID-19 outbreak, various contextual stressors related to the pandemic, such as the school closure, family financial difficulties, work-home balance, and isolation from friends, can intensify or dampen the psychological impact of pandemic-related stress on youth's mental health (Masonbrink & Hurley, 2020; Schmidt et al., 2020). However, research on risk and protective factors during the pandemic is still relatively sparse and mixed (for a review, see Racine et al., 2020).

Stressful Life Events during COVID-19 and Mental Health in Chinese Students

Repeated studies before the pandemic showed that stressful life events (e.g., bad grades in school, family disruptions such as death or parental divorce) have negative impacts on youth's mental health (Ungar & Theron, 2020). Recent studies in China demonstrated that individuals who perceived higher stress from COVID-19-related concerns were more likely to report mental health difficulties, such as emotional distress (e.g., fear, anxiety, depression,

neurasthenia; Yan et al., 2021) as well as loneliness (Wang et al., 2021). Several large-scale studies have indicated increased mental health difficulties among Chinese adolescents whose rates of depression and other mental health problems remained high even when the infection leveled off (Zhou et al., 2020) and as they returned to school in a reopening phase (Zhou et al., 2020). For example, parents reported high psychological distress in children and youth in China, including sleep disturbances, difficulty in maintaining attention, and emotional regulation (Jiao et al., 2020).

Personal Resilience

Resilience is best understood as a process in which individuals adapt successfully despite experiencing adversity (Masten, 2001). Resilience has been studied at multiple levels of analysis, including the intrapersonal capabilities of coping (Raskauskas & Huynh, 2015) and the social resources or supportive interpersonal relationships as well as the dynamic processes of combined responses to adverse experiences (Masten, 2001). The present study focuses on the personal resilience as intrapersonal capabilities. A meta-analysis of 60 studies across wide age ranges has suggested resilience to be a relatively stable intrapersonal characteristics that is associated with both alleviating negative indices of mental health and promoting a positive state of mental health (Hu et al., 2015). Resilience, as measured in one's capability for emotional regulation, adaptive coping strategies, and problem-solving abilities, is a psychological resource in bouncing back from various stressful situations in life and is shown to serve as a protective factor from the negative impact of stressful events on mental health problems (Kuhlman et al., 2021; Niu et al., 2016). One recent study found that American adolescents' cognitive re-appraisal and humor mitigated the negative impact the COVID-19-related concerns have on their depression and anxiety symptoms (Kuhlman et al., 2021). Nonetheless, no published study has examined the potential role of resilience in mitigating the impact of COVID-19-related stressful life events on Chinese youth's mental health outcomes.

Quality of Peer Relationship

An integrative review of studies from 2007–2017, examining the role of social support on youth mental health among middle and high school students across the U.S., has shown that peer emotional support, social connectedness, and competence in close friendships were associated with better mental health, as measured in reduced levels of depression, anxiety, and suicidal ideation (Roach, 2018). Studies have also suggested the buffering role of peer relationships against the negative impact of stressful life events, including interpersonal conflicts, on youth's mental health (Mackin et al., 2017; McMahan

et al., 2020). Moreover, a study conducted with Chinese adolescents showed that students who had negative interpersonal relationships with peers and teachers tended to be at higher risk of mental health problems (Li et al., 2020). Specifically, maintaining good socio-emotional support, communicative interaction, and interpersonal harmony with peers were shown to be important for reducing mental health problems (Li et al., 2020). Given recent research suggesting that adolescents' social connectedness decreased the risk of mental health problems during COVID-19 (Magson et al., 2021), we hypothesized that high quality of peer relationship would serve as a protective role against the negative impact of COVID-19-related stressful life events on Chinese youth's mental health.

Family Process: Parental Involvement

Parental involvement has been linked with youth academic adjustment and psychological wellbeing (Duan et al., 2018; Thomas et al., 2020). Previous studies emphasized the importance of cultural and ecological considerations in assessing parental involvement across diverse ethnic-racial communities (Guo et al., 2018; Kim, 2020) and suggested to take developmental consideration of how effective parental involvement may vary for the period of adolescence (Hill & Tyson, 2009). The conceptualization of parental involvement may take a different form and meaning for East Asian parents, considering their involvement in child's education by supporting at home (Kim et al., 2018). In a meta-analysis of 15 studies with international samples, East Asian parents were shown to engage in more home-based involvement (e.g., homework supervision and assistance) than school-based involvement (e.g., participating in school activities) as many of them assumed teacher's authority and institutional characteristics that limited parent's school involvement on students' achievement (Kim, 2020). A prior study has suggested that when parents provide structures at home and have communication with teachers about the child's learning difficulties, it buffers from transitional difficulties in Chinese seventh graders' school adjustments and emotional distress (Wang et al., 2014).

However, it is unclear whether parents remain involved during the pandemic as they struggle to navigate increased work and family responsibilities as well as how parental involvement may predict youth adjustment during COVID-19. Other family environment, such as having family conflicts during a prolonged quarantine period, may also contribute to parent-child dynamics that affect youth adjustment. Previous studies with Asian immigrant families showed that when family has high level of conflicts, parents may avoid interactions with their children that can intensify tensions (Kane et al., 2018; Kim et al., 2009). This can result in inconsistent or unsupportive parenting, such as having less supervision and monitoring that can have negative

consequences to youth's mental health and behavior problems (Kane et al., 2018; Kim et al., 2009). On the other hand, a recent study with 1,264 elementary school students in Hubei province in China also demonstrated that while children with parents who were not satisfied with their child's grade tended to have greater anxiety symptoms during the pandemic, students with closer parent-child relationship had a decreased risk of anxiety symptoms (Zhu et al., 2020). This suggests that positive parent-child interactions about the child's learning can buffer against the risk of mental health difficulties during COVID-19 pandemic. It also highlights the importance of parental involvement as well as the need to further unpack how parents' academic support predicts the adolescents' mental health during COVID-19.

Family Process: Parental Critical Comparison Practices in China

As a form of parents' psychological control, critical comparison and shaming are often used by Chinese parents when they socialize their children (Ng et al., 2014). Such shaming may involve comparing the child to peers who are portrayed in a more favorable way (e.g., "I often tell my child how other children are better than him/her to motivate my child."). Findings on how parental control are associated with developmental outcomes have been mixed among Asian samples (Barber et al., 2005; Wang et al., 2007). Although less studied, parental critical comparisons are also linked to both positive and negative reports of child adjustment in Chinese adolescents (e.g., Camras et al., 2012; Cheah et al., 2019; Zhu et al., 2020). A recent longitudinal study showed that parents' comparisons of siblings predicted more internalizing and externalizing problems in Chinese adolescents over a 6-month period (Chen et al., 2021). Camras and colleagues (2012) also reported greater depression in both Chinese and American middle-school children under parental comparison practices. Other studies have suggested that negative outcomes such as depression and academic exhaustion did not occur to those Chinese youth who associated parental critical comparison practices with parental warmth and self-improving orientation (e.g., Cheah et al., 2019; Zhu et al., 2020). For Chinese children, greater parental critical comparison when appreciated could be linked with positive outcomes, such as increased school motivation and fewer antisocial behaviors (Camras et al., 2017). Such child-beneficial interpretation reflects unique parenting values under the Confucian and collectivism cultural framework and is more likely to be acceptable by children who are raised in these cultural traditions. During COVID-19 school closure and quarantine, Chinese adolescents and parents were forced to spend many hours together at home, which may intensify the detrimental impact of un-supportive parenting practice. Acceptance by the child may be challenged with increasing tension between parent and child during prolonged home

confinement when all aspects of adolescents' lives were under unprecedented strict control (quarantine) and in concurrence of many other stressors as the result of the pandemic. However, no study to date has examined this culturally specific parenting practice as it relates to youth's mental wellbeing (i.e., covitality) during the COVID-19.

Current Study

The present study investigated how stressful life events related to COVID-19 are associated with youth covitality and mental health difficulties and examined intrapersonal (i.e., resilience), peer (i.e., quality of peer relationships), and family processes (i.e., parental involvement through academic support, critical comparison) as potential risk and protective factors for mental health of adolescents in China during COVID-19 pandemic. We hypothesize that COVID-19-related stressful life events and parent's critical comparison practices would be associated with negative mental health outcomes, whereas personal resilience, high quality of peer relationship, and parental academic support would be associated with positive mental health outcomes. Additionally, we hypothesize high levels of resilience, peer relationship, and parental academic support to serve as protective roles against the COVID-19-related stressful life events on Chinese youth's mental health. We hypothesize that parent's comparison practice would intensify the link between the stressful life events and negative mental health outcomes.

Method

Procedures

Data were collected in a middle school in Beijing, China, at the beginning of the school year (September 2020) as part of the new student screening approved by the school district. At the time of data collection, schools in Beijing have reopened after school closure was first enforced during the spring semester in 2020. Students had in-person classes while wearing masks in order to prevent the spread of the virus. Seventh grade students (i.e., the first year of middle school) and their parents were invited to complete a survey about the transition and adjustment during COVID-19. Parent passive consent format was used for youth to participate as part of the new student screening at school. Parents were notified about the survey, and parents could freely withdraw their child from the survey. No parents withdrew their child. All students gave assent to participate. Students completed the paper-pencil survey at school during a regular class.

Almost all students in the seventh grade participated in the survey unless they were absent during the data collection. Teachers posted the parent survey

link on the class social media page and encouraged parents to participate in the survey, but participation was voluntary. Only one parent per child was invited to participate. Parents completed the survey online after providing consent at the beginning of the survey. Parent surveys were then linked with the student surveys based on student ID. To reduce missing data, parents were reminded to complete each survey question automatically by the online survey software, but they were allowed to skip items after viewing the reminder if they chose to do so. The respective survey took approximately 20 minutes for parents and students to complete. No identifying information was collected. Data from 199 incompatible parent-or-adolescent surveys (IDs not linked together) and 22 incomplete surveys (less than 20% of the items completed) were excluded from the analysis in the study.

Participants

A total of 504 seventh grade students (52.2% boys; data on student age were not collected) and their parents (81.0% mothers, 18.7% fathers; $M_{\text{age}} = 43.2$, $SD_{\text{age}} = 4.8$) were included in the current study. Students reported parents' level of education. Since this middle school is affiliated with a top university in Beijing, parents were highly educated (mainly faculty and staff at the university), with 35.9% holding a bachelor's degree, 43.3% holding a master's degree, and 18.5% holding a doctorate degree. Only 2.1% had high school/junior college degree or lower.

Measures

Stressful Life Events During COVID-19

A six-item questionnaire listing the stressful life events related to the COVID-19 pandemic was developed for the purpose of this study. Items assess participants' experiences of the stressful life events during the COVID-19 pandemic (i.e., "My family experienced financial pressure during the COVID pandemic", "During COVID-19 virtual learning, I had conflicts with my parents because I cannot balance virtual learning and entertainment"). Adolescents responded to items on a 5-point Likert scale (1 = *never*, 5 = *everyday*). A Confirmatory Factor Analysis (CFA) suggested a good model fit, $\chi^2 = 0.075$, $df = 2$, $CFI = 1.000$, $RMSEA = .000$, $SRMR = .003$. The Cronbach's α of the survey was moderate ($\alpha = .61$). Mean scores were used in the subsequent analysis.

Covitality

Adolescents completed the *Social Emotional Health Survey – Secondary Chinese Version* (SEHS-S; Furlong et al., 2014a, 2014b; Xie et al., 2017) and indicated the extent of which they engaged in a particular behavior on a 6-

point Likert scale (1 = *not like me at all*, 6 = *like me very much*). The 36 items of SEHS-S yield 12 subscales that load onto four second-order constructs: *Belief in self* (self-awareness, persistence, self-efficacy) reflects adolescent's attentiveness to aspects of self and purpose in life; *Belief in others* (school support, family coherence, peer support) reflects adolescent's perception that they have the support and care from others; *Emotional competence* (empathy, self-control, behavioral self-control) reflects aspects of emotional awareness; and *Engaged living* (gratitude, zest, and optimism) reflects adolescents' state of being purposefully and meaningfully engaged with their life. The 4 second-order constructs load onto a higher-order latent construct called covitality. This measure has been widely used and has demonstrated sound psychometric properties (Furlong et al., 2021). While covitality is negatively related to distress, substance use, and mental health difficulties, it is a complementary but distinct construct and has been examined simultaneously with other mental health outcomes to gain more holistic understanding of youth's wellbeing as well as to identify a priority group of students to target for intervention (Furlong et al., 2014a, 2021). The measure has also been validated among Chinese samples showing a good construct validity, concurrent validity (significantly correlated with subjective wellbeing and positive affect) and reliability ($\alpha = .92$, Xie et al., 2017). In the current study, all mean score of 36 items was used to indicate covitality, and the measure showed good internal consistency ($\alpha = .95$). CFA suggested a good model fit, $\chi^2 = 1185.654$, $df = 573$, $p < .001$, $CFI = .941$, $RMSEA = .046$, $SRMR = .044$.

Mental Health Difficulties

Adolescents completed the 25-item *Strengths and Difficulties Questionnaire-Chinese* (SDQ; Du et al., 2008; Goodman et al., 1998) and indicated their mental health problems since the quarantine on a 3-point Likert scale (0 = *not true*, 2 = *certainly true*). The SDQ is one of the most commonly used tools to assess adolescent mental health and has been validated in the Chinese adolescents (Du et al., 2008). Additionally, some studies (e.g., Ye et al., 2021) have used the SDQ to assess mental health difficulties during COVID-19. The 25 self-report SDQ items yield five subscale scores on *emotional symptoms* (e.g., "I get a lot of headaches, stomach-aches or sickness."), *conduct problems* (e.g., "I get very angry and often lose my temper."), *hyperactivity/inattention issues* (e.g., "I am restless, I cannot stay still for long."), *peer relationship issues* (e.g. "Other children or young people pick on me or bully me."), as well as *prosocial behavior*. To assess mental health difficulties, the current study used the sum of four subscales excluding the prosocial behavior subscale to calculate the total difficulties score (Goodman et al., 1998). Prior studies have reported good internal consistency and good convergent and

discriminant validity of the measure (Du et al., 2008). In the current study, the internal consistency of the scale was good ($\alpha = .84$).

Personal Resilience

Adolescents completed the *Personal Resilience* subscale of the *Chinese Resilience Scale for Chinese Adolescents* (Hu & Gan, 2008) which measured students' internal capacity to cope with stress and adversity during COVID-19. The measure has been widely used in research on resilience among Chinese children and adolescents (e.g., Wang et al., 2014). The personal resilience subscale included 15 items to measure students' *perseverance with goals* (e.g., five items, e.g., "I have a clear goal in my life."), *emotional regulation* (6 items, e.g., "I am able to regulate my emotion very well in a short time."), and *positive thinking* (4 items, e.g., "I think adversity can motivate people"). Adolescents responded to items on a 7-point Likert scale (1 = *not like me at all*, 7 = *like me very much*). The measure demonstrated good internal consistency and model fit in previous students (e.g., $\alpha = .86$, $CFI = .92$, $RMSEA = .07$; Hu & Gan, 2008). The scale showed good internal consistency ($\alpha = .88$) and good model fit, $\chi^2 = 236.606$, $df = 84$, $CFI = .953$, $RMSEA = .060$, $SRMR = .042$.

The Quality of Peer Relationship

The quality of peer relationship was assessed using the *Questionnaire of Interpersonal Quality* for Chinese students (Liu, 2010), which was developed based on the *Network of Relationship Inventory* (Furman & Buhrmester, 1992). Adolescents responded to items on a seven-point Likert scale (1 = *not like me at all*, 7 = *like me very much*). The quality of peer relationship subscale included both positive (e.g., "I often have fun with my friends", four items) and negative (e.g., "My friend and I often get angry at each other because of dissatisfaction with each other's words or behaviors", three items) aspects. Three items with negative quality were reverse coded. The questionnaire has demonstrated good reliability ($\alpha = .782$) and structural validity ($GFI = .93$, $CFI = .90$, $RMSEA = .051$; Liu, 2010) among Chinese adolescents. The internal consistency was .81. The models fit were $\chi^2 = 43.126$, $df = 11$, $CFI = .971$, $RMSEA = .076$, and $SRMR = .038$.

Parental Academic Support

Parents responded to the *Academic Support* subscale (five items) from the *Revised Parental Involvement Behavior Questionnaire* (Wu et al., 2018). Sample items included "I teach my child study skills and strategies", and "I effectively communicate with my child's teacher" Parents rated the frequency of their involvement in schooling on a 5-point Likert scale (1 = *never*, 3 = *half the time*, 5 = *always*). The measure showed good internal consistency ($\alpha = .71$)

and good model fit in CFA, $\chi^2 = 17.064$, $df = 4$, $CFI = .979$, $RMSEA = .081$, and $SRMR = .032$.

Parental Critical Comparison Practices

Parents completed five items of the *Critical Comparison and Shaming* scale that measured the extent to which parents engage in criticism, comparison, and shaming practices with their child (Camras et al., 2017). Sample items included “When other children are better than my child, I always blame my child.” and “I often tell my child how other children are better than him/her to motivate my child.” Parents rated the frequency of their comparison practices on a 5-point Likert scale ($1 = \text{never}$, $5 = \text{always}$). The measure has previously shown measurement invariance between American and Chinese samples (α above .85; Camras et al., 2017). In the current study, the measure showed a good internal consistency ($\alpha = .80$). CFA suggested good model fit, $\chi^2 = 10.415$, $df = 4$, $CFI = .992$, $RMSEA = .056$, and $SRMR = .017$.

Data Analyses

First, we ran Little’s MCAR test (Myers, 2011), and the results indicated that the data were missing completely at random ($p > .05$). We then used mean score of all the measures in the analysis. The linear regression was used to test the research questions. We examined the normality, linearity, and homoscedasticity assumptions prior to analyses (Fox, 2015). However, the scatterplot of standardized residuals (Y -axis) and predicted outcome (X -axis) indicated the homoscedasticity and linearity assumptions were slightly violated. After using leverage values and Cook’s D to identify cases that were unduly influencing the regression, 8.93% of 504 cases ($n = 45$) were removed from subsequent analysis. When we re-examined the assumptions, the assumptions were satisfied. The regression analysis included 459 students (50.5% boys) and their parents.

We ran two hierarchical regression models in SPSS 26.0. In each model, the first step examined the main effects and included the control variable (i.e., youth’s gender) and the independent variables (i.e., stressful life events, personal resilience, peer relationship, parental academic support, and parental comparison). In the second step, the interaction terms were added to examine the moderation effects. To reduce collinearity, the independent variables and potential moderators were mean-centered before computing the interaction terms. To provide additional evidence of the moderation analysis, the Johnson-Neyman technique via Process (Hayes, 2017) was used to calculate the “regions of significance,” indicating that the association between the predictor and the outcome is statistically different from zero (Carden et al., 2017). The standardized estimates of the regression analysis were reported.

Table 1. Descriptive Statistics and Pearson's Correlations for All Study Variables.

	1	2	3	4	5	6	7
C_Stressful life events	–						
C_Covitality	–.408**	–					
C_Mental health difficulties	.375**	–.635**	–				
C_Resilience	–.387**	.755**	–.703**	–			
C_Peer relationship	–.263**	.546**	–.450**	.474**	–		
P_Parental involvement	–.115*	.095*	–.076	.061	.169**	–	
P_Parental critical comparison	.074	–.121**	.091	–.067	–.079	.063	–
Mean	0.836	5.367	0.358	5.624	6.098	3.749	1.763
SD	0.687	0.508	0.235	0.955	0.867	0.684	0.574
Minimum	1.000	3.860	0.000	2.600	1.910	1.910	1.000
Maximum	3.000	6.000	1.250	7.000	7.000	7.000	4.000

Note. C is referring to child-reported measures, whereas P is referring to parent-reported measures.

* $p < .05$ ** $p < .01$.

Results

For youth mental health, 6.55% ($n = 33$) of the students reported slightly elevated scores (14–16) of mental health difficulties (SDQ), 3.97% ($n = 20$) reported elevated scores (17–19), and 4.56% ($n = 23$) reported very high scores (20–40) that indicated a very high risk of clinically significant problems. Mean, standard deviation, and correlations can be found in [Table 1](#).

Risk and Protective Factors for Mental Health Difficulties and Covitality

We examined the main effects separately for covitality and mental health difficulties (see [Table 2](#)). In the covitality model, COVID-19 stressful life events negatively predicted covitality ($\beta = -.106$, 95% CI [-.124, -.033], $p = .001$). Parental critical comparison practices marginally and negatively predicted covitality ($\beta = -.055$, 95% CI [-.117, .001], $p = .055$). Personal resilience and the quality of peer relationship positively predicted youth's covitality ($\beta = .608$, 95% CI [.287, .359], $p < .001$; $\beta = .217$, 95% CI [.088, .165], $p < .001$). Parental academic support ($\beta = .010$, 95% CI [-.039, .046], $p = .722$) did not predict covitality. In the model of mental health difficulties, stressful life events during COVID-19 positively predicted youth mental

Table 2. Hierarchical Linear Regression Models Predicting Covitality and Mental Health Difficulties.

	Covitality				Mental Health Difficulties			
	Model 1		Model 2		Model 1		Model 2	
	B(SE)	β	B(SE)	β	B(SE)	β	B(SE)	β
C_SLE	-.078 (.023)**	-.106**	-.252 (.120)*	-.341*	.036 (.012)**	.104**	.097 (.063)	.282
C_Resilience	.323 (.018)**	.608**	.324 (.018)**	.609**	-.148 (.010)**	-.599**	-.146 (.010)**	-.594**
C_Peer relationship	.127 (.020)**	.217**	.127 (.020)**	.217**	-.036 (.010)**	-.131**	-.35 (.010)**	-.130**
P_Involvement	.008 (.022)	.010	.008 (.022)	.011	-.002 (.011)	-.007	-.003 (.011)	-.008
P_Comparison	-.049 (.025) ^a	-.055 ^a	-.056 (.026)*	-.064*	.014 (.013)	.033	.014 (.014)	.035
Gender	.044 (.030)	.043	.044 (.030)	.043	-.011 (.016)	-.023	-.009 (.016)	-.019
C_SLE x C_Resilience			-.007 (.026)	-.010				-.037
C_SLE x C_Peer relationship			.020 (.031)	.022			-.028	-.067 ^a
C_SLE x P_Parental involvement			.047 (.032)	.240			-.016 (.017)	-.177

(continued)

Table 2. (continued)

	Covitality				Mental Health Difficulties			
	Model 1		Model 2		Model 1		Model 2	
	B(SE)	β	B(SE)	β	B(SE)	β	B(SE)	β
C_SLE x P_Critical comparison			-.083 (.041)*	-.058*			.012 (.022)	.018
F	F (6, 452) = 128.727***		F (10, 448) = 78.277***	F (10, 448) = 82.624***	F (6, 452) = 82.624***		F (10, 448) = 51.257***	
R ²	.631		.636	.523			.534	
ΔR^2			.005	.011				

Note. SLE = Stressful life events during COVID-19 pandemic. C = child-reported. P = parent-reported. The interaction terms as potential moderators were entered in model 2 (the second step).

* $p < .10$ ** $p < .05$ *** $p < .01$ **** $p < .001$.

health difficulties ($\beta = .104$, 95% CI [.011, .060], $p = .004$). Personal resilience and the quality of peer relationship negatively predicted youth's mental health difficulties ($\beta = -.599$, 95% CI [-.167, -.128], $p < .001$; $\beta = -.131$, 95% CI [-.056, -.015], $p = .001$). However, parental academic support ($\beta = -.007$, 95% CI [-.024, .021], $p = .839$) and parental critical comparison practices ($\beta = .033$, 95% CI [-.011, .051], $p = .313$) did not predict mental health difficulties.

Resilience, Peer Relationships, and Parenting Practices as Moderators

To test the moderation effects, four interactions (stressful life events x personal resilience, stressful life events x quality of peer relationship, stressful life events x parental academic support, stressful life events x parental comparison) were included in the regression models. Results showed that the parental critical comparison practices moderated the relation between stressful life events during COVID-19 and youth covitality ($\beta = -.058$, 95% CI [-.161, .000], $p = .046$). The quality of peer relationship, personal resilience, and parental academic support did not serve as moderators (Table 2).

To further examine the moderation effect, we used the Johnson-Neyman approach (Hayes, 2017). When parental critical comparison was higher than 1.600, the region of significance was identified ($b = -.237$, 95% CI [-.461, -.013], $SE = .114$, $p = .038$; see Figure 1). Most parents (60.6%) reported that the scores of their parenting comparison were higher than 1.600. The result indicated that when students reported more stressful life events, they tended to have less covitality, and this relation was stronger when parents reported more parental comparison (Figure 1), suggesting that critical comparison practices intensified detrimental effect of stressful life events.

Discussion

The present study focuses on early adolescence, a significant developmental period in which youth's transition to middle school cooccurs with increasingly complex and influential peer context as well as changes in their socio-cognitive capabilities and challenges in parent-child communication. This study investigated how stressful life events during COVID-19 pandemic are associated with youth's mental health and examined risk and protective factors including personal (i.e., resilience), peer (i.e., quality of peer relationships), and family processes (i.e., parental academic support and critical comparison) in Chinese families. Findings revealed that COVID-19 pandemic has impacted Chinese youth's lives as reflected in their report of various stressful events (e.g., conflict with parents, family financial pressure, learning difficulties) and a proportion of them (about 15%) show serious mental health difficulties. Additionally, parents remained highly involved in their child's learning during COVID-19, and critical comparison was a prevalent practice

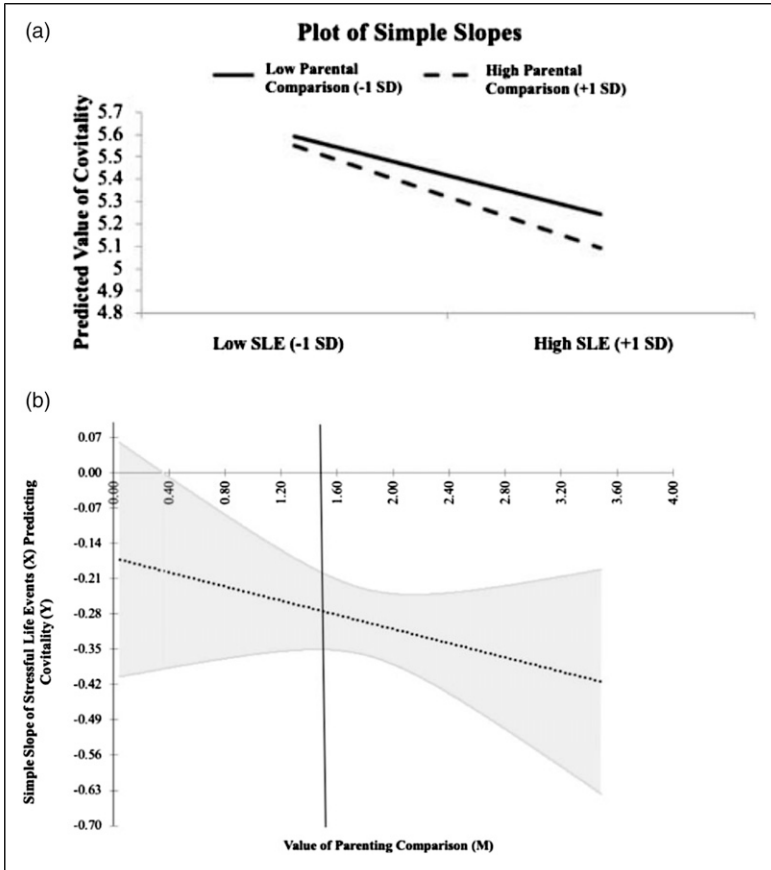


Figure 1. The Parental Comparison Moderating the Effect of Stressful Life Events During COVID-19 on Youth Covitality Controlling for Gender. 1A. Simple Slopes for Stressful Life Events \times Parental Comparison. 1B. Region of Significance for Parental Comparison. Note. SLE = Stressful life events during COVID-19 pandemic. At a 95% confidence level, the effect of stressful life events during COVID-19 on covitality is significant when the parental comparison $\geq m^*$, where $m^* = 1.456$.

in our sample. Results identified the COVID-19-related stressful life events to be a risk factor for Chinese youth's mental health (i.e., more mental health difficulties, less covitality), and personal resilience and quality of peer relationship were promotive factors. Additionally, parent's critical comparison practices were a risk factor for youth's covitality but not for mental health difficulties. Parental critical comparison practices also intensified the hindrance of youth covitality from experiencing stressful life events during COVID-19. These findings extend the literature by being the first to examine

how risk and protective factors at multiple levels are associated with both negative and positive indices of youth's mental health during COVID-19 pandemic.

Our results further support the positive roles of personal resilience (Hu et al., 2015; Kuhlman et al., 2021) and peers in youth's mental health (Li et al., 2020; Mackin et al., 2017; McMahan et al., 2020). Adolescents' personal resilience serves as a psychological resource for coping in times of stressful events, such as COVID-19 pandemic (Kuhlman et al., 2021). Having a positive appraisal of the pandemic stressors as sources of personal growth can alleviate mental health distress and promote more positive mental health state. Similarly, having a better peer relationship not only mitigated mental health difficulties under stress but also contributed to positive building blocks of mental health (i.e., covitality). Our data were collected during the re-opening phase as students began to return to school after a prolonged shelter-in-place. Having good peer relationships can facilitate youth to process the pandemic in a supportive atmosphere and may make the help-seeking behaviors more acceptable for youth and promote better coping strategies, which in turn, contributes positively to their mental health.

In line with previous studies (Camras et al., 2017), about 23.4% of Chinese parents in our sample engaged in critical comparison practices during COVID-19 pandemic. Our finding shows a significant and negative correlation between parents' report of critical comparison practices and their adolescent's report of covitality. It added to evidence of negative effects of psychological control on adolescent adjustment in general. Similar to Camras and colleagues' (2012), our data suggest that this type of parenting practice may be detrimental to youth's positive functioning. Critical comparison practices did not directly predict youth mental health difficulties in our study but served as a moderator that intensified the detrimental effects of stressful life events on covitality among youth whose parents practiced high level of critical comparison. In other words, the parenting practice that involves highly critical comments and shaming of their child in comparison to other peers can hinder youth's covitality when they are already experiencing stressful events during COVID-19 pandemic. Perhaps, parents' critical comparison practices compounded with the ongoing negative experiences (e.g., quarantine, isolation from friends, virtual learning) during pandemic further disrupts youth's ability to overcome challenges. Previous research showed that some Chinese adolescents made positive interpretation of parental control and viewed it as an expression of love and caring (Wang et al., 2022). However, during COVID-19 pandemic, adolescents experience a lot of stress and live in a highly controlled environment (e.g., quarantine). This context might make it harder for adolescents to interpret additional control from parents (e.g., criticism and comparison) positively. On the other hand, the stressful life events by parental critical comparison interaction only explained 0.05%

additional variance of the covitality, suggesting that this small effect size should be interpreted carefully despite its significant moderation. Furthermore, parental critical comparison scores had a non-significant and positive association with parental academic support, suggesting that both measures may reflect a continuing academic orientation in Chinese parents. More studies need to continue to examine the factors influencing not only youth mental health difficulties but also the factors contributing to the positive catalysts of wellbeing.

Surprisingly, personal resilience only directly predicted covitality and mental health difficulties, but did not serve as a buffer. Future researchers may want to further unpack personal resilience to understand what may be undergoing in one's resilience process (seeing it as an outcome or better-than-expected). One candidate could be the additional challenges that COVID-19 brings for new seventh-graders' transition to middle school. For example, a recent study among Chinese elementary, middle, and high school students showed that seventh grade marked the beginning of the decline of students' resilience, and the seventh graders reported much lower score than students in the elementary school (Zhu et al., 2022). As a result, seventh graders in our study may not have sufficient resilience to serve as a buffer for stressful life events. Similarly, the quality of peer relationship also did not provide a buffer from the negative impact of COVID-19-related stressful events on their mental health. The buffering role of peer support has been mixed among recent studies in times of COVID-19 (Campion-Barr et al., 2021; Ellis et al., 2020; Zhu et al., 2022), perhaps due to adjustment in preventive policies (e.g., physical distancing, face covering) that affect the quality of maintaining meaningful and sustained support. More studies are needed to unpack different factors impacting the dynamics of peer support and its contributions to adolescents' mental health during times of pro-longed stress.

In contrast to a previous study that has shown protective role of parental involvement in adolescents' mental health (Wang et al., 2020), parental involvement through academic support did not predict youth covitality nor mental health difficulties. This may be explained by the quality of parent-adolescent interactions, which was not assessed in this study. Study has suggested that parents may be more involved when students are struggling with their schoolwork. Parent's perception of child's difficulty in learning has shown to be associated with poor mental health in adolescents during COVID-19 pandemic (Zhu et al., 2020). Nearly half (41.7%) of our current sample reported having conflict with parents during COVID-19. While parental involvement has previously shown to have a positive effect on youth mental health (Wang et al., 2019), the emotional valence of the parent-child interaction/conflict during COVID-19 may blur this relation, leading to non-significant results.

Limitations and Future Directions

The current study has limitations and areas for improvement. First, the study is cross-sectional, and the directionality of the relations cannot be assumed. A longitudinal study can reveal more about whether and which process changes over the course of the pandemic. In regards to specification of our constructs, second limitation is that constructs like ‘resilience’ and ‘parental involvement’ need further unpacking. While personal resilience was conceptualized as a trait in this study, the literature suggests more complex and dynamic process of resilience. Our study also only assessed one aspect of parental involvement (i.e., academic support), which may be less salient to mental health during COVID-19. Related limitation concerns the informant of our measures. We only used parent-report of parental academic support and parenting measures and, given the unequal sample sizes, did not compare results between father- and mother-reported parental involvement. Study has suggested differing perception of students’ and parents’ reports of parental involvement, such that parents tended to report higher level of involvement than their child and that children tended to view parents focusing on monitoring of their grades whereas the parents showed greater interest in their child’s school and learning activities (Thomas et al., 2020). Similarly, the lack of the adolescents’ perspective of parental critical comparisons practices did not allow for closer examination of the effect of social comparison. Prior research also showed that paternal involvement in youth’ learning had differential impact on youth’s mental health above and beyond maternal involvement (Goncy & van Dulmen, 2010; Zhu et al., 2021), Therefore, future study should recruit more fathers and include adolescent-reported measures to understand how youth perception of parental involvement could impact their wellbeing during COVID-19.

Another limitation includes the use of the Stressful Life Events (SLE) measure. The reliability for this measure was not ideal ($\alpha = .61$) possibly because participants may only experience some SLE but not others, and the measure was relatively short. Future research should continue to refine the COVID-related SLE measure. Lastly, our limitation concerns the generalizability of our findings. The sample was drawn from students whose middle school is affiliated with a top university in China, with the majority having highly educated parents. Findings cannot be generalized to broader population of Chinese families with different demographic background (e.g., lower levels of education or social economic backgrounds), and future studies should include more different schools with varying student characteristics. Additionally, some cases were excluded from the analysis due to survey matching and other methodological issues from the initial assessment. For instance, 45 cases were deleted to handle the violation of statistical assumptions (Fox, 2015) because the extreme cases can unduly influence the estimated

regression function, such that the analyses with and without these 45 devious cases can yield different results (e.g., Without excluding these 45 cases, we found similar results for the main effects, but the interactions were no longer significant). Future studies can benefit from a larger and more diverse sample to further examine these relations.

Implications and Conclusion

The current study has strengths in using a culturally diverse sample of Chinese adolescents and parents during COVID-19 pandemic and examining culturally relevant constructs (critical comparison) and various protective factors at personal, family, and school/peer levels. This study also extends the prior literature to examine the positive construct of mental health (i.e., covitality). Considering that the personal resilience and peer relationship are promotive factors for youth mental health, while stressful life events and parental critical comparison practices appear to be risk factors, it is important to promote youth resilience and positive peer relationships during the pandemic. While social distancing and mandates for wearing masks at school have made peer interactions very challenging, it calls on teachers and parents to find creative ways to foster peer relationships. Parents also need to be sensitive to adolescents' needs for autonomy and fun while trying to balance children's learning and entertainment during such stressful times. Furthermore, to foster resilience, it is crucial for parents and teachers to teach youth coping and emotional regulation strategies and enhance positive thinking/optimism. These skills can help students recover from life stressors (e.g., COVID-19, quarantine, social distance).

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