



Daily Association between COVID-19 cases and parents' emotions: the role of marital relationship quality

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Abstract

The continuing impact of daily stress during the COVID-19 pandemic has disrupted the lives of families worldwide, and increased the risk of psychological problems for parents and their children. The current study investigated the daily effect of COVID-19 cases on parents' positive and negative emotions among 163 Taiwanese families using daily diary methodology across 10 weekdays. Results of multilevel modeling indicated that parents reported fewer positive emotions on days when COVID-19 cases were higher than average. Further moderating analyses showed the adverse effect of COVID-19 cases was only evident when the same-day marital relationship quality was lower than usual. The findings highlight the psychological stress of COVID-19 cases on parents' daily emotions and identify the protective role of marital relationship quality. Policies and clinical interventions should consider the implications of daily COVID-19 stressors for parents' emotional well-being, and target the protective role of marital relationship quality in daily life.

Keywords COVID-19 · Emotion · Mood · Parent · Marital relationship · Stress · Daily diary

Introduction

The COVID-19 pandemic highly impacts individual's general well-being worldwide (Ettman et al., 2020; Hawes et al., 2021). Uncertainties and worries about work and health, along with social distancing and school lockdown, have direct effects on individuals' psychological adjustment, such as depression, anxiety, and sleep problems (Cellini et al., 2021; Deng et al., 2021). Parents are especially vulnerable to COVID-19-related stress due to financial needs and job loss, childrearing and educational concerns, and psychological distress and burdens as caregivers (Moscardino et al., 2021; Prime et al., 2020; Russell et al., 2020). Although findings on disruptions of psychological well-being during the pandemic for children and adolescents are emerging, there is limited evidence about how the pandemic directly influences parents' daily emotions. Less is known about the

psychological effect of daily COVID-19 cases on parents' well-being during day-to-day processes.

The importance of parental well-being during the pandemic

Concerns about daily COVID-19 cases can heighten individual psychological stress and have significant adverse effects on psychological functioning and mental health (Alkhamees et al., 2020; Kola et al., 2021; Tee et al., 2020; Yue et al. 2020). Parents' emotional problems (e.g., depression, anxiety) have been documented to have long-term detrimental influences on child adjustment and well-being (Murray et al., 2008; Goodman, 2020; Schepman et al., 2011), whereas parental support can facilitate positive family climate which reduces child and adolescent internalizing problems and psychological distress (Chiang & Bai, 2022; Inguglia et al., 2015; Kapetanovic et al., 2020). In particular, parents of adolescents generally experience high parenting stress and parent-child conflicts during adolescence compared to childhood (Collins & Russell, 1991; Stone et al., 2016). However, the majority of current studies related to the COVID-19 pandemic focus on the challenges and disruptions in children and adolescents (Panchal et al., 2021; Racine et al., 2021; Wang et al., 2021). Few studies have

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investigated the effect of COVID-19 cases on parents' emotions in a daily process. For example, a multi-week daily diary study found that adolescents' negative affect increased but positive affect did not significantly decrease before versus during the pandemic (Deng et al., 2021). Another study points out that adolescents reported increases in negative affect and decreases in positive affect during the pandemic (Rogers et al., 2021). In addition, adults also experienced greater levels of negative affect during the COVID-19 lockdown in Spain (Megías-Robles et al., 2022). These findings indicate that individuals tend to experience changes in their emotions (e.g., higher negative mood) and warrant further investigation into parents' daily emotional experiences in the current study.

Family resilience and protective factors

The family resilience framework posits that resilience emerges through the identification of protective factors which moderate the relationship between significant risk to family members and their healthy functioning (Patterson, 2002). Parents may experience greater levels of stress, fear, and worries during the COVID-19 pandemic, suggesting the need for evaluating parents' resilience and vulnerability during this period. Family demands such as household incomes, caregiving for their children, and family members' health issues are likely to exacerbate along with daily COVID-19 cases and undermine parents' resilience, leading to greater emotional burden and negative emotions. In contrast, the positive marital relationship may represent a protective factor that promotes parents' resilience against daily COVID-19 cases. Previous studies indicate that marital relationship is one of the most influential predictors of individuals' well-being (Proulx et al., 2007), and even moderated the association between traumatic events and marital well-being (Broman et al., 1996). Therefore, it is possible that marital relationship can serve as a protective factor for parents to cope with stress related to daily COVID-19 cases.

The COVID-19 context in Taiwan

Taiwan has approximately 23 million citizens and was expected to have the highest numbers of COVID-19 cases due to its proximity to China (Wang et al., 2020). Nevertheless, with strong prevention strategies (e.g., border control) and public health implementation (e.g., masking, hand washing), Taiwan has one of the lowest mortality rates (Lo et al., 2021; Wei et al., 2021). During the data collection from November 2021 to January 2022, there were no specific COVID-19 related policies for school and social lockdown for domestic citizens, whereas regular social distancing and masking were required in public. According to

the Centers for Disease Control (CDC) in Taiwan (CDC, 2021), the numbers of daily COVID-19 cases were relatively stable during the data collection compared to the time between May and July 2021 when the COVID-19 cases significantly increased. Consequently, when daily COVID-19 cases are higher, it is possible that parents would be more worried about the two-week self-quarantine and the negative impacts on their jobs (e.g., unpaid leave, business disclosure), as well as potential social restriction and school lockdown (e.g., during May and July 2021). Therefore, increases in daily COVID-19 cases could be an added stress learning about the negative consequences that could heighten parents' stress and burden.

More importantly, extant research generally assessed the impact of the COVID-19 pandemic through subjective measures of psychosocial stressors, such as fear of illness and death, anxiety, and posttraumatic stress, on child and adult well-being (Klaiber et al., 2021; Taylor et al., 2020; Zhang et al., 2020). However, little empirical evidence has examined the implications of daily COVID-19 cases, while such an objective measure might facilitate quick and effective evaluations for health officials, health care providers, and clinicians working with families and parents. Given that daily COVID-19 cases may be utilized as an objective indicator of the pandemic-related stressors in shaping emotional responses to potential outbreaks, it is critical to investigate whether parents' daily emotions are linked to the ups and downs of daily COVID-19 cases for improving our public health policies and interventions. Together, a critical next step is to investigate how official COVID-19 cases might be associated with parents' positive and negative emotions in daily life.

The current study

The current study sought to fill the gap in the literature on how daily COVID-19 cases were associated with parents' positive and negative emotions, and how marital relationship may moderate the association using a daily sample of 163 parents in Taiwan. Drawing on the family resilience framework, we hypothesized that parents might experience lower levels of positive emotions and higher levels of negative emotions on days when COVID-19 cases were higher than usual, representing risk exposure to the family resilience. We also hypothesized that marital relationship may be a protective factor that buffers the negative effect of daily COVID-19 cases on parents' emotions. Given the nested nature of the data, we evaluated the moderating role of marital relationship at both within-person and between-person levels.

Method.

Participants

A 10-day diary sampling was used to collect repeated reports in Taiwan. The sample consisted of 163 parents (78% mothers, 21% fathers; $M_{age} = 45.46$ years, $SD = 4.91$) in two-parent families with at least one adolescent children ($M_{age} = 12.79$ years, $SD = 0.73$, 55% female). Parents' education ranged from below high school degree (3.7%), high school degree (20.2%), college degree (60.7%), and graduate degree (15.3%). Household income levels ranged from low-income (3.1%), middle-to-low (2.5%), middle (58.3%), upper-to-middle (35%), and rich (1.2%).

Procedure

Data were collected between November 2021 and January 2022. Participants were recruited through schools where the research team introduced the study purpose and procedures with the approval of school principals. Participants were required to agree to participate and meet eligibility, including being the primary caregiver for a least one child and access to the internet and daily surveys. Participants completed informed consent, followed by baseline questionnaires about demographic, family relationship, and well-being. Diary surveys were collected from Monday to Friday for two consecutive weeks. All surveys were sent at 6 p.m. with person-specific links to participants' preferred communication platforms (e.g., emails, phone apps) with secured individualized passwords. Daily surveys were accessible for parents until 9 a.m. the next morning, although few parents had completed in the morning (< 3%). It took approximately 15 min and 3 min to complete baseline and daily surveys, respectively. Participants were compensated with cash or gift cards by choice after the study: \$3.5 per daily survey and up to \$35 for completing all surveys. All procedures were reviewed and approved by the Institutional Review Board.

Measures

Daily COVID19 Cases. Daily cases were drawn from the CDC in Taiwan. Since there were two panels collected across two schools, the first panel started from November 8 to 19 in 2021 at the first school, and the second panel started from December 20 in 2021 to January 4 in 2022 at the second school. No significant difference was found in demography and primary variables between the two panels.

Daily Positive and Negative Emotions. Parents reported their daily emotions on four items adapted from the Positive and Negative Affect Schedule (PANAS, Watson et al., 1988). Using a slider scale of 0 to 10, parents responded to questions about their positive emotions, such as interested

Table 1 Descriptive statistics and Pearson correlations of main variables

	1	2	3	4
1. Daily COVID-19 cases	1			
2. Daily marital relationship	0.09**	1		
3. Daily positive emotions	-0.05*	0.51***	1	
4. Daily negative emotions	0.04*	-0.22***	-0.51***	1
Mean	13.7	7.52	7.14	1.52
SD	6.26	2.35	2.19	1.94

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

and happy, and negative emotions, such as distressed and sad. The score ranged from 0 (*not at all true*) to 10 (*very much true*).

Daily Marital Relationship Quality. Marital relationship quality was reported daily by parents at night. Using a slider scale of 0 to 10, parents responded to two items, such as "I get along with my partner today." The score ranged from 0 (*not at all true*) to 10 (*very much true*).

Results

This study used multilevel models in R software. Daily measures were person-mean centered, and others were grand-mean centered (Bolger & Laurenceau, 2013). Table 1 presented means, standard deviations, and correlations among the main variables. Daily COVID-19 cases were associated with lower levels of positive emotions ($r = -.05$, $p < .05$) and higher levels of negative emotions ($r = .04$, $p < .05$). Daily marital relationship was associated with higher levels of positive emotions ($r = .51$, $p < .001$) and lower levels of negative emotions ($r = -.22$, $p < .001$). As shown in Table 2, parents reported fewer positive emotions on days when COVID-19 cases were higher than average ($b = -0.03$, $p < .05$). However, daily COVID-19 cases were not associated with negative emotions ($b = 0.01$, $p > .05$). Further, a two-way interaction was significant between daily COVID-19 cases and daily marital relationship, and the simple slope analysis was conducted at -1 SD and +1 SD levels of marital relationship. As shown in Fig. 1, higher COVID-19 cases were associated with greater negative emotions on days when the same-day marital relationship quality was lower than usual ($b = 0.03$, $p < .05$). In contrast, higher COVID-19 cases were associated with fewer negative emotions on days when the same-day marital relationship quality was higher than usual ($b = -0.06$, $p < .01$).

Discussion

The current study extends the current literature about the daily association between COVID-19 cases and parents'

Table 2 Daily associations between COVID-19 cases and emotions

	Positive Emotions				Negative Emotions			
	<i>b</i>	SE	95% CI	<i>p</i>	<i>b</i>	SE	95% CI	<i>p</i>
<i>Step 1: Main effect</i>								
Intercept	7.01	0.23	[6.57, 7.48]	0.000	1.84	0.23	[1.35, 2.24]	0.000
Daily COVID-19 cases	-0.03	0.01	[-0.04, -0.01]	0.044	0.01	0.01	[-0.11, 0.53]	0.169
Daily marital relationship	0.46	0.03	[0.37, 0.49]	0.000	-0.26	0.03	[-0.31, -0.19]	0.000
Average marital relationship	0.48	0.05	[0.37, 0.58]	0.000	-0.16	0.05	[-0.25, -0.05]	0.003
<i>Step 2: Interaction</i>								
Daily COVID-19 cases x Daily marital relationship	0.01	0.01	[-0.02, 0.01]	0.087	-0.02	0.01	[-0.04, -0.01]	0.000
Daily COVID-19 cases x Average marital relationship	0.00	0.01	[0.00, 0.01]	0.051	0.00	0.01	[-0.01, 0.01]	0.903

Note. Gender, family income, and time were controlled in the models. 95% CI: 95% confidence intervals

emotions. In this study, we are able to examine the day-to-day emotional fluctuations of a Taiwanese sample of parents during the COVID-19 pandemic. Based on the family resilience framework (Patterson, 2002), the results generally supported our hypotheses that COVID-19 cases represent psychological stress on parents, and marital relationship quality can promote family resilience during the pandemic. The findings identified that parents reported fewer positive emotions on days when COVID-19 cases were higher than average. Furthermore, daily marital relationship quality was a protective factor that buffered the effect of daily COVID-19 cases on their negative emotions. Specifically, parents reported lower levels of negative emotions when COVID-19 cases increased on days when they experienced greater than usual marital relationship quality. In contrast, on days when marital relationship quality was lower than

usual, parents experienced higher levels of negative emotions when COVID-19 cases increased. Consistent with previous research (Chiang & Bai, 2022; Jenkins et al., 2005; Proulx et al., 2007; Robles et al., 2014), marital relationship is important for maintaining couple and family functioning. These findings suggest that daily COVID-19 cases may heighten the stress on parents, but daily marital relationship quality can reduce such stress for parents.

Several limitations should be noted, such as the sample was collected in Taiwan and more diverse samples should be replicated. The findings may not generalize to other populations and more studies should recruit participants in different countries. Also, a limited number of measurement items was utilized to reduce participant burdens. However, few items may limit the interpretations of a specific psychological construct. In addition, self-reported measures are

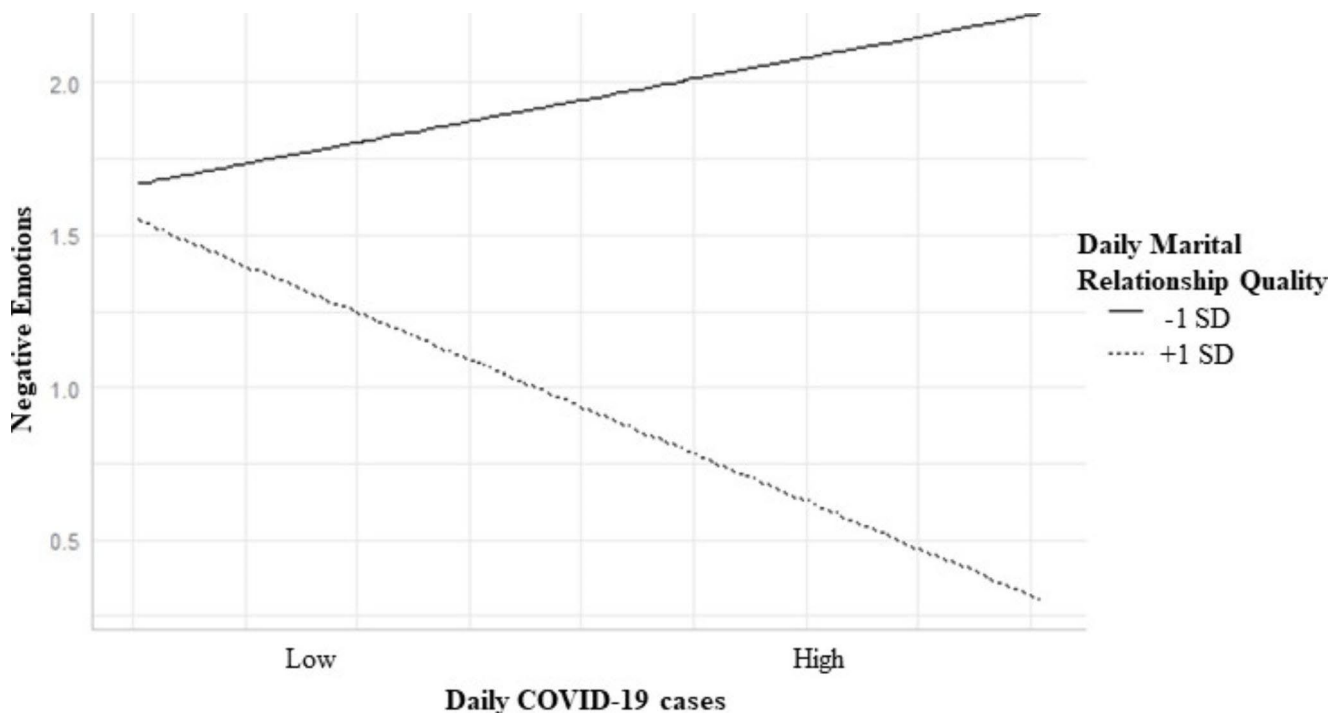


Fig. 1 Daily Marital Relationship Quality as a Moderator between Daily COVID-19 Cases and Negative Emotions

Note. Solid line indicates daily marital relationship quality at -1 SD below the mean, and dashed line indicates daily marital relationship quality at +1 SD below the mean.

susceptible to response biases. Future research should consider the physiological measures of individual stress levels in daily life. Next, the 10-day diary design may not capture sufficient within-person variances, and longer diary studies are needed to further examine the day-to-day links between the COVID-19 pandemic and individual well-being. Finally, we did not directly measure whether parents monitored daily COVID-19 cases in our daily study or include self-reported COVID-19 concerns as subjective stress. However, correlations and multilevel analyses showed that there were significant associations between daily COVID-19 cases (i.e., objective measures) and parents' well-being (i.e., marital relationship, positive and negative emotions), suggesting participating parents may evaluate daily COVID-19 information given the rapid changes in COVID-19 pandemic for most families in Taiwan. Future research would benefit from including both subjective (e.g., official reports of daily cases) and objective (e.g., self-report stress, anxiety) COVID-19 stressors to evaluate how families experience psychosocial distress during the COVID-19 pandemic.

In conclusion, the present study provides novel insights into the direct consequences of COVID-19 cases using a daily diary study collected during the pandemic. The findings underscore the importance of examining parents' daily emotions as COVID-19 cases increase every day, and the protective role of daily marital relationship quality. The results have implications for policy and practice for improving family resilience and well-being. For instance, family-based prevention and intervention programs can target the daily quality of marital relationships to promote parents' well-being and potentially benefit other family members. These efforts would serve to nurture positive marital relationships and protect parents from potential adverse effects of daily emotional burdens during the COVID-19 pandemic.

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Data and code availability Due to privacy and ethical concerns, the data are not available. Codes are available on the request to the corresponding author.

Declarations

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Competing interests The authors have no competing interests to declare that are relevant to the content of this article.

Ethics approval The study was approved and followed by the Institutional Review Board of the National Chengchi University (NCCU-REC-202105-I038). The study is in accordance with the Declaration of Helsinki.

Consent Informed consent was obtained from all individual participants included in the study.

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