

ORIGINAL ARTICLE

Perceived organizational support and PTSD symptoms of frontline healthcare workers in the outbreak of COVID-19 in Wuhan: The mediating effects of self-efficacy and coping strategies

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Abstract

The present study aimed to examine the effect of perceived organizational support on the PTSD symptoms of frontline healthcare workers, and to examine the mediating effects of coping self-efficacy and coping strategies in this relationship. A short-term longitudinal study design was used to conduct two waves of online surveys in March and April 2020. Participants comprised 107 medical staff in both waves of investigation. Self-efficacy, coping strategies, and perceived organizational support were reported at Wave 1, and PTSD symptoms were reported at Wave 2. Results indicated that (1) The prevalence of probable PTSD was 9.3% and 4.7% on the Chinese version of the Impact of Events Scale-Revised of 33 and 35, respectively. Local healthcare workers had greater risks of PTSD than the members of medical rescue teams. Doctors reported higher PTSD symptoms than nurses. (2) Perceived organizational support had a significant indirect effect on PTSD symptoms through the mediation of problem-focused coping strategies and the sequential mediating effect of coping self-efficacy and problem-focused coping strategies. The findings highlight the importance of providing adequate organizational support to reduce PTSD symptoms in frontline medical staff during the COVID-19 pandemic.

KEYWORDS

coping strategies, frontline healthcare workers, perceived organizational support, PTSD symptoms, self-efficacy

INTRODUCTION

Nearly a year has passed since the global pandemic of COVID-19 began in late 2019. According to data released by the World Health Organization (WHO), as of December 2, 2020, there were 62,844,837 confirmed cases of novel coronavirus pneumonia, and 1,465,144 related deaths have been reported globally (WHO, 2020). The spread of the virus was accompanied by the proliferation of anxiety, fear, and uncertainty. Therefore, the COVID-19 pandemic is not only a threat to people's lives, but also poses a challenge to people's mental health worldwide.

Stress and PTSD symptoms among frontline healthcare workers

Wuhan is the first city where COVID-19 emerged in China. At the initial stage of the outbreak, the sudden surge of patients dramatically impacted local healthcare systems. Due to a lack of awareness and inadequate protective measures, over 1000 healthcare workers in Wuhan were infected with the coronavirus by February 2020 (Hou, 2020). In response to this situation, 346 medical teams were dispatched from major hospitals in China, totaling 42,600 healthcare workers, to support Wuhan and other areas of Hubei Province by March 8, 2020 (Thepaper, 2020).

The frontline healthcare workers have been identified as a high-risk group for psychological problems including post-traumatic stress disorder (PTSD). Because of the exposure on the job, healthcare workers have to face the threat of infection. This threat could become traumatic when the personal protective measures are not adequate. Furthermore, healthcare workers are likely to experience secondary trauma by witnessing the constant sufferings and even deaths of the patients with COVID-19 (Dutheil et al., 2020; Maiorano et al., 2020; Vagni et al., 2020a, 2020b). The high workload, social isolation, and limited knowledge and awareness about the virus in the initial period also contributed to the acute stress symptoms in the frontline healthcare workers, which could potentially degenerate into chronic PTSD (Dutheil et al., 2020).

Empirical research has demonstrated that frontline healthcare workers exhibited heightened levels of acute stress responses during or immediately after the pandemics (Benfante et al., 2020; Carmassi et al., 2020; Chan, 2004; Di Tella et al., 2020; Lu et al., 2006; Nickell, 2004; Phua, 2005; Stuijzand et al., 2020; Tam et al., 2004). And they are also more likely to have higher PTSD symptoms several years after the outbreak (Lee et al., 2018; Sim et al., 2010; Wu et al., 2009). Therefore, it is important to monitor the PTSD symptoms of frontline healthcare workers even after the outbreak. Furthermore, we must examine the factors associated with these PTSD symptoms and provide timely interventions to prevent negative mental health outcomes among this population.

Organizational support and psychological adaptation among frontline healthcare workers during COVID-19 pandemic

Perceived organizational support, which is an external resource of coping, refers to employees' global beliefs regarding the extent to which the organization values their contributions and cares about their well-being (Eisenberger et al., 1986).

Based on social exchange theory, perceived organizational support raises employees' expectations that the organization would reward greater efforts, thus motivating employees to work harder to meet the organizational goals. Furthermore, perceived organizational support meets employees' needs for praise and approval, and fosters a positive emotional bond with the organization. Numerous studies have found that perceived organizational support predicts higher organizational commitment and improves job performance (Chiang & Hsieh, 2012; Miao & Kim, 2010). However, research on perceived organizational support is usually conducted in enterprises under ordinary circumstances, and organizational support perceived by frontline healthcare workers during the COVID-19 pandemic may differ.

Rangachari and Woods (2020) used the framework of organizational resilience to argue that effective support for frontline healthcare workers is a prerequisite of organizational resilience. This further illustrates the importance of implementing measures at the organizational level during the COVID-19 pandemic. First, the organization is solely responsible for providing adequate essential material supplies to healthcare workers to mitigate employees' risk of infection. Second, the organization is accountable for establishing a learning system to assist the frontline healthcare workers' master novel solutions in specific situations and reduce their sense of uncertainty. Third, once a climate of trust is established in the organization, the frontline healthcare workers must be encouraged and supported. Therefore, effective organizational support during the COVID-19 pandemic includes instrumental support and emotional support. The beneficial effects of organizational support on the mental health of frontline healthcare workers have been mentioned in previous studies in circumstances of epidemics (Chan, 2004; Lancee et al., 2008; Marjanovic et al., 2007; Maunder et al., 2003, 2008). However, the empirical research actually measuring perceived organizational support and examining its effects is scarce.

Coping self-efficacy, coping strategies, and psychological adaptation

In addition to organizational support, personal coping is also important and more causally related to individuals' psychological reactions. Coping self-efficacy refers to the perceived capacity to manage one's personal functioning and adapt to the environmental demands while dealing with stressful events (Benight & Bandura, 2004). Social cognitive theory of post-traumatic recovery emphasizes the important role of coping self-efficacy in reactions toward stress. According to this theory, coping self-efficacy influences one's vigilance toward potential threats. Individuals who believe that they can exercise control over these threats are less likely to be distressed. In contrast, people with low self-efficacy are more likely to overestimate the threats and worry about their negative outcomes (Benight & Bandura, 2004; Lazarus & Folkman, 1987). The protective effect of self-efficacy on the post-traumatic stress symptoms has been proven for various traumatic experiences in previous research (Bosmans & van der Velden, 2017; Ginzburg et al., 2003; Guerra et al., 2018; İsbir et al., 2016). Thus, it is reasonable to hypothesize that coping self-efficacy would be negatively associated with PTSD symptoms among frontline healthcare workers combatting COVID-19.

Coping strategies are also considered important internal resource to influence coping outcomes (Lazarus & Folkman, 1987). Coping strategies could be classified into problem-focused coping and emotion-focused coping. The former refers to active coping behaviors to resolve the stressful situation, while the latter emphasizes regulating emotions to make the stressful situation more tolerable (Lazarus, 1990). Existing literature on the effects of coping strategies, on dealing with traumatic stress, indicated that problem-focused coping is effective in reducing PTSD symptoms (Gil, 2005; He et al., 2013). Previous research focusing on COVID-19 also reported that problem-focused coping strategies such as proper use of self-protective measures, additional learning about prevention and

treatment of COVID-19, and seeking help from family and friends are effective in reducing psychological symptoms of frontline healthcare workers (Cai et al., 2020; Vagni et al., 2020a). However, results regarding the effect of emotion-focused coping are inconsistent. Emotion-focused coping has been found to reduce psychological distress of healthcare workers in some studies (Lorente et al., 2020), but not in others (Zhou et al., 2020). Thus, based on previous research findings, it was hypothesized that problem-focused coping would be negatively associated with PTSD symptoms among frontline healthcare workers.

In addition, according to the transactional model of stress and the social cognitive theory of post-traumatic recovery, self-efficacy influences one's usage of coping strategies. People with higher levels of coping self-efficacy are more likely to adopt problem-focused coping strategies (Benight & Bandura, 2004). Therefore, it was hypothesized that problem-focused coping strategies mediated the association between coping self-efficacy and PTSD symptoms.

The enabling hypothesis: influence of organizational support on coping self-efficacy and coping strategies

Benight and Bandura (2004) argued that social support promotes one's internal coping resources by enhancing coping self-efficacy. Specifically, supporters could model coping attitudes and skills and motivate the individual through incentives and encouragement. The enabling hypothesis has been supported by previous research findings (Mak et al., 2009; Warner et al., 2015). Organizational support was also found to predict the increase in one's self-efficacy within organizational settings (Caesens & Stinglhamber, 2014). Given the collaborative nature of treating patients with COVID-19, instrumental and emotional support from the organization is more relevant and could be effective to enhance the coping self-efficacy of healthcare workers to manage their environmental demands. In line with this rationale, it was hypothesized that organizational support has the enabling function to enhance coping self-efficacy and is, in turn, negatively associated with PTSD symptoms.

Overview of the present study

The present study aimed to examine the effects of perceived organizational support, self-efficacy and two types of coping strategies on the PTSD symptoms of frontline healthcare workers fighting against COVID-19 in Wuhan. Based on previous theories and research findings, the following hypotheses were proposed: (1) Perceived organizational support would negatively predict the subsequent PTSD symptoms of the frontline healthcare workers; (2) self-efficacy and problem-focused coping strategies would mediate the association between perceived organizational support and healthcare workers' PTSD symptoms. Since the results of the effects of emotional coping strategies are mixed, this issue was left for exploration. The hypothesized model is demonstrated in Figure 1.

METHODS

Participants

Eighty-three (77.6%) local healthcare workers and 24 (22.4%) medical team members who were deployed to Wuhan from other provinces of China participated in the study. There were 31 males (29.0%)

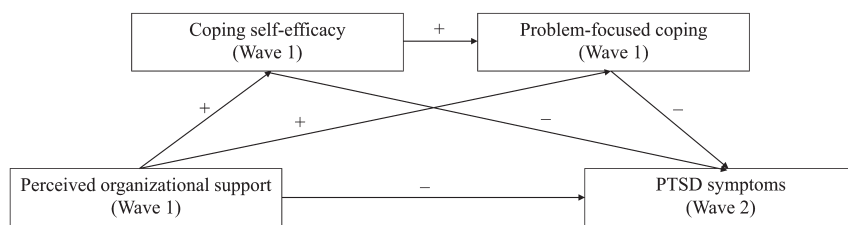


FIGURE 1 The hypothesized model

and 76 females (71.0%). More than a half of the participants were nurses ($n = 68, 63.6\%$), 26.2% of participants were doctors ($n = 28$), 9 were administrators (8.4%), and 2 were medical technicians (1.9%). The age of the participants ranged from 21 to 50 years old, with the average age 32.07 years old. The age group, specialty, length of working experience, professional titles, and marriage status of the healthcare workers are displayed in Table 1 in detail.

The working arrangements during the COVID-19 pandemic are also indicated in Table 1. Eighty-seven participants (81.3%) were working in critical departments in the battle combating COVID-19 such as the quarantined ward, fever clinic, and emergency department. Most of participants had direct contact with patients with COVID-19 ($n = 91, 85\%$) and suspected cases ($n = 96, 89.7\%$). Twenty-two participants (20.6%) reported their daily working hours <6 h, 47 (43.9%) worked for 6–8 h every day, 33 (30.8%) worked for 8–10 h per day, and 5 (4.7%) reported their working hours were more than 10 h.

Measures

Demographic questionnaire

Demographic questions such as gender, career, specialty, professional title, working experience, and marital status were collected. Participants were also asked to answer questions on general working arrangement in the COVID-19 outbreak period such as workplace during the pandemic, contact with patients with COVID-19 and daily working hours.

PTSD symptoms

The Chinese version of Impact Event Scale-Revised (CIES-R) was used to measure post-traumatic stress symptoms of the frontline healthcare workers. It is a 22-item questionnaire, which measures three clusters of symptoms of PTSD including intrusion, avoidance, and hyperarousal. Participants were asked to rate severity of each symptom on a 5-point Likert scale where 0 = not at all, 1 = a little bit, 2 = moderately, 3 = quite a bit, and 4 = extremely. CIES-R has demonstrated good psychometric properties (Wu & Chan, 2003) and had been widely used to measure PTSD symptoms in Chinese samples. Although CIES-R is considered as a reliable and valid instrument for PTSD screening, the exact cutoff point in general population of China has not been established. The only study setting a cutoff of CIES-R was reported by Huang et al., (2006) in the population of female offenders and they suggested a cutoff point of 35 to indicate the higher risk of psychological problems (Huang et al., 2006). Some studies focusing on medical rescue workers appointed to the 2008 Wenchuan earthquake response used the cutoff at 33 (Schenk et al., 2017). Consistent with Li et al. (2020), we provided results for cutoffs of 33 and 35 at the same time. The Cronbach's α was .95 in the present study.

TABLE 1 Demographic characteristics of participants

	Frequency	Percentage (%)
Gender		
Male	31	29.0
Female	76	71.0
Affiliation		
Local hospital	83	77.6
Medical teams	24	22.4
Career		
Doctors	28	26.2
Nurses	68	63.6
Medical technicians	2	1.9
Administrators	9	8.4
Specialty		
Respiratory medicine	25	23.4
Infectious diseases	10	9.3
ICU	21	19.6
Others	51	47.7
Age, year		
	32.07 ± 6.23	
<30	50	46.7
31–40	47	43.9
41–50	10	9.3
Working experience, year		
<5	36	33.6
5–10	34	31.8
>10	37	34.6
Professional title		
Junior	60	56.1
Intermediate	39	36.4
Senior	8	7.5
Marital status		
Unmarried	29	27.1
Married	74	69.2
Divorced	3	2.8
Other	1	0.9
Department in the pandemic		
The quarantined ward	76	71.0
Fever clinic	7	6.5
Emergency department	4	3.7
Others	20	18.7
Contact with confirmed cases		
Yes	91	85.0

(Continues)

Table 1 (Continued)

	Frequency	Percentage (%)
No	16	15.0
Contact with suspected cases		
Yes	96	89.7
No	11	10.3
Daily working hours		
<6 h	22	20.6
6–8 h	47	43.9
8–10 h	33	30.8
>10 h	5	4.7

Perceived organizational support

A perceived organizational support scale was developed based on the existing measurements of organizational support (Eisenberger et al., 1986; Ling et al., 2006) and description of supportive measures provided by the hospitals in the previous pandemics (Maunder et al., 2008). There are six items to measure organizational support perceived by the frontline healthcare workers from three aspects, that is instrumental support (“the hospital has provided adequate protective materials and equipment”), emotional support (“My contribution in fighting against the epidemics was recognized and valued by my organization”), and institutional protection (e.g. “the hospital provided clear instructions on the diagnosis and treatment of the patients with COVID-19”). Participants were asked to rate the items on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) with higher scores indicating higher level of perceived organizational support. The Cronbach's alpha of this scale was 0.92 in the present study.

Coping self-Efficacy

A 4-item questionnaire was adapted from the measurement of trust on the protective measures developed by Marjanovic et al. (2007) to measure the self-efficacy of the frontline healthcare workers in the COVID-19 crisis. The examples of the items were “I think the pandemic could be effectively controlled” and “I believe we could overcome the difficulties.” This is a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) with higher scores indicating higher coping self-efficacy. The Cronbach's alpha of this scale was .91 in the present study.

Coping strategies

A positive coping scale was developed to measure positive coping strategies used by the frontline healthcare workers. The items were generated using results of a qualitative research on the effective coping strategies of nurses working in the SARS wards (Lee et al., 2005). There are 9 items in the scale to measure the frequency of using several positive coping strategies. Participants were asked to rate the items on a 5-point Likert scale (1 = never, 5 = always) with higher scores indicating more frequent usage of positive coping strategies. The structure of this scale had been examined in a pilot study with another sample of frontline healthcare workers in Wuhan ($N = 311$). Results of exploratory

factor analysis (EFA) indicated that there were two factors in the scale and the two-factor model explained 70.50% of total variance. The first factor was named problem-focused coping strategies that contained 5 items. An example was “take self-protection measures such as washing hands, wearing masks and taking temperature.” The second factor was named emotion-focused coping which contain 4 items. And an example was “doing meditation, Yoga or Tai Ji to release.” The Cronbach's α s for the two subscales were .92 and .75 in the present study.

Procedure

The present study was approved by the research ethics committee of Peking University Health Science Center. The first wave of data collection was conducted in March 2020 (2020.3.9–3.12) when the number of confirmed cases in Wuhan was growing fast (National Health Commission of the People's Republics of China, 2020). And the second wave of data collection was done a month later, when the epidemic in Wuhan was largely under control and the medical rescue teams finished their work and ended 2 weeks of quarantine.

Healthcare workers were recruited through an advertisement posted by doctors of the research team in a COVID-19 designated hospital in Wuhan. The healthcare workers were eligible if they were working in the designated hospital during the study period. There were no specific exclusion criteria. Eligible participants were asked to scan a QR code and to complete the questionnaires online. Informed consent was given to each participant before filling in the questionnaires. And all the participants were thanked and given 10RMB after finishing the questionnaires. Four hundred and fourteen participants filled out questionnaires at Wave 1 and 228 respondents provided effective data at Wave 2. Finally, 107 healthcare workers took part in the both two waves of survey and provided effective data for analyses.

Statistical analyses

SPSS 18.0 was used to analyze data. Descriptive analyses, t -tests, ANOVA, χ^2 tests, and multiple regressions were used in the data analyses.

RESULTS

PTSD symptoms of frontline healthcare workers

The mean of PTSD symptoms of participants was 11.42 ± 11.83 . Using 33 as the cutoff point in IES-R (Schenk et al., 2017), 10 healthcare workers (9.3%) were identified as experiencing symptoms of PTSD (IES-R scores greater than or equal to 33). Using 35 as the cutoff score, 5 participants (4.7%) were identified as experiencing symptoms of PTSD.

Demographic characteristics and working arrangement on PTSD symptoms

Demographic differences and working arrangement differences on PTSD symptoms were examined. As the results indicated, local healthcare workers (13.18 ± 12.31) reported higher PTSD symptoms compared with medical team members deployed to Wuhan (5.33 ± 7.42), $t(62.95) = 3.87$, $p < .001$.

TABLE 2 Descriptive statistics and correlation among variables (*N* = 107)

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11
1. Gender	–	–	1										
2. Age	32.07	6.24	–0.20	1									
3. POS1	21.04	3.24	–0.10	–0.13	1								
4. SE1	4.19	0.85	–0.01	0.14	0.30**	1							
5. PFC1	22.08	2.95	0.12	–0.08	0.40**	0.30**	1						
6. EFC1	11.18	3.81	0.23**	–0.22**	0.24**	0.14	0.43**	1					
7. POS2	23.20	5.26	–0.01	–0.04	0.69**	0.08	0.19**	0.23*	1				
8. SE2	4.10	0.84	0.12	0.07	0.36**	0.29**	0.30**	0.19*	0.49**	1			
9. PFC2	21.98	3.43	–0.03	0.12	0.41**	0.31**	0.53**	0.26**	0.42**	0.50**	1		
10. EFC2	11.66	3.97	0.10	–0.34**	0.29**	0.04	0.31**	0.49**	0.22**	0.38**	0.38**	1	
11. PTSD2	11.42	11.83	0.10	0.03	–0.29**	–0.13	–0.29**	–0.01	–0.19	–0.09	–0.14	0.06	1

Abbreviations: EFC1 = emotion-focused coping strategies at Wave 1; EFC2 = emotion-focused coping strategies at Wave 2; PFC1 = problem-focused coping strategies at Wave 1; PFC2 = problem-focused coping strategies at Wave 2; POS1 = perceived organizational support at Wave 1; POS2 = perceived organizational support at Wave 2; PTSD2 = post-traumatic stress symptoms at Wave 2; SE1 = coping self-efficacy at Wave 1; SE2 = coping self-efficacy at Wave 2.

***p* < 0.01.

The difference in PTSD symptoms was also significant depending on their career type; doctors (14.68 ± 12.80) reported higher PTSD symptoms than nurses (9.60 ± 11.08), $F(1, 94) = 4.22$, $p = .043$. Medical technicians and administrative staff were excluded from this comparison because of the small sample size. No significant differences on PTSD were found for participants varied in gender, age groups, professional titles, working experience, and specialties.

Regarding the differences of working arrangement on PTSD, the PTSD total scores were significantly different for healthcare workers in various daily working hour groups, $F(2, 104) = 3.64$, $p = .030$. Healthcare workers working for more than 8 h every day had higher PTSD symptoms compared with the counterparts whose daily working hours were less than 6 h (14.95 ± 11.96 versus 6.77 ± 10.83 , $p < .01$). No significant differences on PTSD were found for healthcare workers varied in work place during the pandemic, chance of exposure to conformed and suspected cases.

Model testing

Correlation among the main variables

As displayed in Table 2, PTSD symptoms of healthcare workers after the frontline work combatting COVID-19 was negatively associated with perceived organizational support ($r = -.29$, $p = .002$) and problem-focused coping strategies at Wave 1 ($r = -.29$, $p < .001$). Its correlations with organizational support, self-efficacy, and two types of coping strategies at wave 2 were not significant. Perceived organizational support at Wave 1 had positive correlations with coping self-efficacy, problem-focused coping and emotion-focused coping at both Wave 1 and Wave 2. Coping self-efficacy (Wave 1) was positively correlated with problem-focused coping strategies ($r = .30$, $p = .001$ for Wave 1 and $r = .31$, $p = .152$ for Wave 2) but not significantly correlated with emotion-focused coping strategies ($r = .14$, $p < .01$ for Wave 1 and $r = .04$, $p = .685$ for Wave 2).

The mediating model testing

The PROCESS macro (model 6) (Hayes, 2013) and bootstrapping procedure were used to test the association between perceived organizational support and subsequent PTSD symptoms and the sequential mediating effects of coping self-efficacy and coping strategies. Because the emotion-focused coping was not significantly correlated with PTSD symptoms, only the mediating role of problem-focused coping was tested. In order to examine the hypothesized model, PTSD symptoms (wave2) were used as the dependent variable, perceived organizational support (Wave 1) was used as the independent variable, coping self-efficacy (Wave 1) and problem-focused coping strategies (Wave 1) were mediators, while age and gender were used as covariates. The bootstrap samples were set at 1000. Results indicated that organizational support significantly predicted variations on self-efficacy, ($\beta = .33$, $p < .01$); organizational support and self-efficacy had significant predictive effects on problem-focused coping ($\beta = .35$, $p < .01$; $\beta = .21$, $p < .05$; respectively). In the regression using PTSD symptoms as the dependent variable, the effect of problem-focused coping was significant ($\beta = -.22$, $p < .05$); however, the effect of self-efficacy and organizational support was not significant. The mediating model was with pathway coefficients, which are displayed in Figure 2.

Regarding the mediating effects of coping self-efficacy and coping strategies, the direct effect of organizational support on PTSD symptoms was not significant, while the total indirect effect was

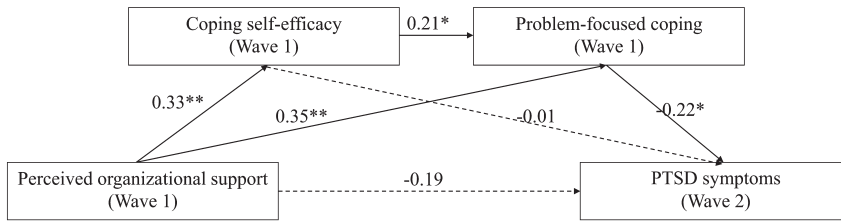


FIGURE 2 The mediating effects of coping self-efficacy and problem-focused coping strategies in the association between perceived organization support and subsequent PTSD symptoms after controlling for gender and age

significant (total indirect effect = -0.09 , $SE = 0.05$, 95% CI = $[-0.23, -0.01]$). Specifically, the mediating effect of problem-focused coping strategies on PTSD symptoms was significant ($\beta = -.08$, $SE = 0.05$, 95% CI = $[-0.21, -0.001]$), the mediating effect of coping self-efficacy was not significant ($\beta = -.002$, $SE = 0.04$, 95% CI = $[-0.08, 0.08]$), and the sequential mediating effect of coping self-efficacy and problem-focused coping strategies was significant ($\beta = -.02$, $SE = 0.01$, 95% CI = $[-0.08, -0.01]$).

DISCUSSION

The present study aimed to examine the effect of organizational support on the PTSD symptoms of frontline healthcare workers combatting COVID-19, using a short-term longitudinal research design. Coping self-efficacy and coping strategies were proposed as mediating variables in the association between organizational support and PTSD symptoms. Results indicated that perceived organizational support reduced PTSD symptoms through the mediating effect of problem-focused coping and the sequential mediating effect of self-efficacy and problem-focused coping strategies.

As suggested by the results, 4.7% to 9.3% of participants were identified as having clinically significant PTSD symptoms, depending on various cutoff criteria. This was similar to proportions found in a survey using a sample of healthcare workers in Singapore and India; however, the mean scores of IES-R in the present study were higher (Chew et al., 2020). The severity of the pandemic and the measures taken by hospitals and the government in different areas may have contributed to the variations in the psychological adaptation of frontline healthcare workers.

In the present study, organizational support provided by the hospital to frontline healthcare workers during the COVID-19 pandemic was evaluated by the provision of personal protective measures, clear instructions on changes in work routines, and a supportive working environment. Organizational support was negatively correlated with PTSD symptoms of the frontline healthcare workers one month later. This result was consistent with a study using a sample of frontline nurses working in hospitals in the Philippines (Labrague & Santos, 2020). Regarding the mechanism of the association between organizational support and the subsequent PTSD symptoms, the enabling hypothesis was supported. On one hand, instrumental and information support from the organization directly facilitated problem-solving and increased the usage of problem-focused coping strategies. On the other hand, perceived organizational support enhanced coping self-efficacy of frontline healthcare workers and in turn promoted the usage of problem-focused coping strategies.

In line with results of previous research (e.g. Cai et al., 2020; Vagni et al., 2020), problem-focused coping was found to be effective to reduce PTSD symptoms. The nonsignificant effect of emotion-focused coping on the PTSD symptoms could be explained by the goodness of fit hypothesis.

According to this hypothesis, emotion-focused coping is effective in reducing psychological distress when the event is perceived as uncontrollable, but it is rendered ineffective in controllable situations (Conway & Terry, 1992). As indicated by the results, the coping self-efficacy of participants was generally high. That is, treating COVID-19 patients is largely perceived as controllable with the various channels of support provided by the organizations. In this situation, emotion-focused coping is less likely to be used and is not effective to reduce PTSD symptoms. In line with the rationale of social cognitive theory of post-traumatic stress recovery, self-efficacy predicted the reduce of PTSD symptoms by the mediating effect of problem-focused coping.

The results of the present study have practical implications regarding the provision of psychological support to frontline healthcare workers. Generally, protective measures must be implemented at both the individual and organizational levels. At the individual level, self-efficacy and problem-focused coping strategies are important focal points of the intervention to prevent or mitigate PTSD symptoms. At the organizational level, providing effective support may be especially important during disasters such as the COVID-19 pandemic. According to previous literature and current experiences of the COVID-19 pandemic (Maunder et al., 2008; Rangachari & Woods, 2020), several suggestions for organizational support are proposed. First, the organization must provide adequate protective equipment and training to reduce the risk of infection and to improve the psychological safety of healthcare workers. Second, novel solutions regarding safety considerations of the frontline healthcare workers and the patients must be developed with clear instructions, providing standard protocols to mitigate the loss of certainty for healthcare workers. Third, leaders are also encouraged to improve communication with employees and foster a climate of trust.

The present study has several limitations. First, all the participants were sampled at one hospital in Wuhan and the sample size was relatively small. The results need to be further replicated with larger and more diverse samples. Second, only two types of coping strategies (i.e. emotion-focused coping and problem-focused coping) were measured. Other coping strategies such as avoidance coping might also contribute to PTSD symptoms in frontline healthcare workers (Badour et al., 2012). Effects of other coping strategies should be examined in future research. Third, although a longitudinal design was used, the interval between the two waves of the survey was relatively short. It is possible that PTSD symptoms could not be detected that early and the proportion of people with higher levels of PTSD had been underestimated. Because job exposure to the COVID-19 pandemic has potential long-term deleterious effects on psychological health, it is important to have a long-term follow-up to examine the predictive effects of organizational support and personal coping resources on the psychological adjustment of frontline healthcare workers.

Nevertheless, the findings of the present study emphasized the important role of organizational support in reducing PTSD symptoms among frontline healthcare workers combatting COVID-19 by enhancing self-efficacy and increasing the usage of problem-focused coping strategies. The results shed light on the provision of organizational support for frontline healthcare workers tackling the COVID-19 virus and similar pandemics and epidemics in the future.

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CONFLICTS OF INTEREST

None.

ETHICAL APPROVAL

All procedures involving human participants in this study were performed in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author.

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