



Relationship between workplace violence, job satisfaction, and burnout among healthcare workers in mobile cabin hospitals in China: Effects of perceived stress and work environment

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ARTICLE INFO

Keywords:

Workplace violence
Perceived stress
Work environment
Job satisfaction
Burnout
Mobile cabin hospitals
Mediating role

ABSTRACT

Background: Although workplace violence is prevalent in the healthcare system, the relationship between workplace violence, job satisfaction, and burnout among healthcare workers (HCWs) in mobile cabin hospitals in China during the COVID-19 pandemic has not yet been investigated. This study analyzes the mediating effects of perceived stress and work environment in the relationship between workplace violence, job satisfaction, and burnout.

Methods: A cross-sectional study was conducted in December 2022 on 1,199 frontline HCWs working in mobile cabin hospitals in Chongqing, China, during the COVID-19 pandemic. Multiple linear regression and mediation analysis were performed.

Results: A positive correlation was observed between workplace violence and burnout ($r = 0.420, P < 0.01$) and perceived stress ($r = 0.524, P < 0.01$), and a negative correlation was observed with job satisfaction ($r = -0.254, P < 0.01$). The perceived stress was positively correlated with burnout ($r = 0.528, P < 0.01$) and negatively with job satisfaction ($r = -0.397, P < 0.01$). Job satisfaction was negatively correlated with burnout ($r = -0.300, P < 0.01$). Perceived stress plays a significant mediating role between workplace violence and job burnout and between workplace violence and job satisfaction. The work environment has a significant moderating effect between workplace violence and job burnout and between workplace violence and job satisfaction.

Conclusion: To reduce burnout among HCWs, hospital administrators should focus on reducing the incidence of workplace violence and perceived stress from work and on improving the work environment and job satisfaction.

1. Introduction

In November 2022, an outbreak of SARS-CoV-2 Omicron Subvariant BA.2.76 was recorded in Chongqing, China, prompting the immediate implementation of various control management measures such as dynamic closure. However, such a drastic response tremendously increased the pressure on the already overworked and overstretched medical and healthcare system of Chongqing. In addition, this latest outbreak extended the pandemic to three years since the outbreak of COVID-19 in 2019, putting both healthcare workers (HCWs) and the general population under extreme economic and psychological

pressures (Yeboah and Yaya, 2023; Unni, 2020). The COVID-19 pandemic exponentially increased the number of patients, which not only increased the workload of medical staff but also put them at a greater risk of workplace violence (Zhang et al., 2023).

Workplace violence in hospitals refers to instances where HCWs are subjected to verbal abuse, threats, or physical attacks, which adversely impact their health, safety, and well-being (Liu et al., 2019). Hospital workplace violence has become quite common, especially in Asia and North America (Zhang et al., 2023; Hadavi et al., 2023; Duan et al., 2019). Notably, the incidence of workplace violence among frontline HCWs significantly increased during the COVID-19 pandemic (Arafa

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<https://doi.org/10.1016/j.pmedr.2024.102667>

Received 2 October 2023; Received in revised form 22 February 2024; Accepted 22 February 2024

Available online 28 February 2024

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et al., 2022; Tiesman et al., 2023). Workplace violence is recognized as a significant factor that contributes to the perceived stress of HCWs and reduces their work efficiency (Zheng et al., 2022; Choi et al., 2022). In addition, it has a significant direct impact on the job satisfaction and turnover intention of HCWs (Cheung et al., 2018; Li et al., 2019).

Perceived stress is the psychological reaction of an individual after a threatening stimulus in their cognitive environment (Busler et al., 2022). It has been established that working in the healthcare industry is highly stressful (Alwhaibi and Al Aloola, 2023; Besa et al., 2023). Perceived stress, anxiety, and job burnout among HCWs increased during the COVID-19 pandemic (Teo et al., 2021; Zhou et al., 2023). Job burnout is a psychological state that causes negative emotions and pessimistic attitudes because of chronic stress, emotional fatigue, and lack of work resources (Guseva et al., 2021). Perceived stress is a major predictive factor for job burnout (Sabei et al., 2022). The incidence of job burnout of HCWs is higher than that of other professions, and different departments are also different (Shen et al., 2022). The COVID-19 pandemic considerably increased the burnout rate of HCWs (Sabei et al., 2022). Workplace violence is positively correlated with the perceived stress and burnout of HCWs (Rayan et al., 2019; Kim et al., 2018). Work environment and job satisfaction are other important factors affecting job burnout among HCWs (Sabei et al., 2020). A positive work environment is negatively correlated with job burnout (Sabei et al., 2022).

Work environment refers to the geographical and social context in which an individual engages in work, including physical conditions of the workplace, organizational culture, interpersonal relationships, and job requirements (Munro and Hope, 2020). For the present study, we have defined job satisfaction as the overall level of satisfaction that HCWs experience regarding their work (Kinzl et al., 2005). Job satisfaction can be determined by comparing the perceptions and expectations of HCWs regarding various aspects of their work, such as the nature of the job, work pressure, interpersonal relationships, working conditions, rewards, and organizational management (Kinzl et al., 2005). Notably, HCWs do not generally report a high level of job satisfaction, which further reduced during the COVID-19 pandemic (Makowicz et al., 2022). Song et al. (2020) pointed out that job satisfaction is highly correlated with work environment and human resources. Job satisfaction plays a moderating role between work environment and burnout (Sabei et al., 2020) and a mediating role between workplace violence and turnover intention (Li et al., 2019).

Many studies have examined the relationship between workplace violence, burnout, job satisfaction, work environment, and perceived stress separately. However, whether workplace violence affects job burnout and job satisfaction by influencing perceived stress (that is, mediating effect), and whether the influence of workplace violence on job burnout and job satisfaction is interfered with by the work environment (that is, moderating effect) has not been effectively explored. We herein explore the mediating and moderating roles of perceived stress and work environment on workplace violence, burnout, and job satisfaction in an attempt to provide a reference to improve the job satisfaction and reduce the burnout of HCWs. We used the frontline HCWs of Chongqing mobile cabin hospitals in China as the research object.

2. Methods

2.1. Participants

We conducted an online survey using the QuestionStar platform from November to December 2022 during the COVID-19 pandemic. A total of 1199 frontline HCWs working in mobile cabin hospitals in Chongqing, China, participated in this survey. All survey instruments were administered in Chinese. The survey included the “AACN Healthy Work Environment Assessment Scale,” “Physician Burnout Questionnaire,” “Healthcare Workers Job Satisfaction Scale,” “Hospital Workplace

Violence Questionnaire,” and “Chinese version of the Perceived Stress Scale.”

The following inclusion criteria were applied: (a) HCWs working in a mobile cabin hospital; (b) participants possessing relevant professional qualifications; and (c) participants who gave informed consent and volunteered to participate in the study. The following exclusion criteria were applied: (a) HCWs who have worked in a mobile cabin hospital for less than 7 days; and (b) participants who never came into contact with COVID-19 patients or their blood/fluids during their work period. The study was approved by the Ethics Committee of the First Affiliated Hospital of Chongqing Medical University (No: 2022–208).

2.2. General information questionnaire

The demographic data of HCWs regarding the following 18 items were collected: gender; age; working years; occupation; marital status; parental status; education level; original work department; title; work area; workload; sleep quality; whether or not they ever participated in the rescue of major public health emergencies; whether or not they received psychological intervention or training for fighting against COVID-19; whether or not they received support from family members, friends, or colleagues during the pandemic; whether or not they had physical discomfort during the pandemic; whether or not they were infected with COVID-19; and satisfaction with the doctor/nurse–patient relationship.

2.3. AACN healthy work environment assessment tool

The scale was originally published on the AACN website (<https://www.aacn.org/>) in 2010 and was translated and revised into Chinese by Ding et al. (2019). The scale comprised 18 items across six dimensions: skilled communication, true collaboration, effective decision-making, appropriate staffing, meaningful recognition, and authentic leadership. The total Cronbach’s α -coefficient of the scale was 0.970, and the Cronbach’s α -coefficient of each dimension ranged from 0.792 to 0.883. The items on the scale were scored based on a 5-point Likert scale (1 = total disagreement; 5 = extreme agreement). The total score of the scale ranged from 18 to 90. A score of < 54 is considered as needing improvement, a score between 54 and 72 is considered good, and a score \geq 72 is considered excellent. If the total score of one dimension is < 9, the relevant content of this dimension could be improved.

2.4. Physician’s career burnout questionnaire (PCBQ-PMI)

The scale was developed by Li and Wu (2005) and revised by Zhang et al. (2012). The scale comprised 11 items across three dimensions: emotional exhaustion (5), depersonalization (3), and reduced personal accomplishment (3). The total Cronbach’s α -coefficient for the scale was 0.952, and the α -coefficient for each dimension ranged from 0.845 to 0.913. The items on the scale were scored based on a 5-point Likert scale (1 = total disagreement; 5 = extreme agreement). The total score of the questionnaire ranged from 11 to 55. A higher score indicates a higher level of current burnout.

2.5. Job satisfaction questionnaire for medical staff

The questionnaire was developed by Wang et al. (2017) and is used to assess job satisfaction among HCWs. The scale comprised 20 items across six dimensions: the nature of the job (2), work pressure (2), interpersonal relationships (4), working conditions (4), rewards (4), and organizational management (4). The total Cronbach’s α -coefficient for the scale was 0.945. The α -coefficients for each dimension ranged from 0.831 to 0.915. The five-point Likert scale (1–5 points) was used to score each item (1 = total disagreement; 5 = extreme agreement). The total score of the questionnaire ranged from 20 to 100. A higher score

indicates a higher level of job satisfaction among HCWs.

2.6. Questionnaire on hospital workplace violence

This questionnaire was derived from the “Workplace Violence in the Health Sector Country Case Studies Research Instruments Survey Questionnaire,” jointly designed by the [International Labour Organization and World Health Organization \(2003\)](#). It was translated and revised into Chinese by [Xia \(2023\)](#). This questionnaire is used to assess workplace violence and includes five standardized questions, one each on verbal abuse, verbal threats, physical violence, sexual harassment, and sexual assault. The Cronbach’s α -coefficient for the scale was 0.816. Each item is rated on a scale from 0 to 3, with 0 representing “never” and 3 representing “often” (0 = 0 times, 1 = 1 time, 2 = 2–3 times, 3 \geq 4 times). The total score ranges from 0 to 15. The higher the total score, the higher the frequency of exposure to workplace violence.

2.7. Chinese perceived stress scale (CPSS)

The scale was developed by [Cohen et al. \(1983\)](#) and was translated and revised into Chinese by [Yang and Huang \(2003\)](#). It comprised 14 items across two dimensions: tension (7) and loss of control (7). The five-point Likert scale (0–4 points) was used to score each item, with 0 representing “total disagreement” and 4 representing “extreme agreement.” The total α -coefficient of the scale was 0.748, and the α -coefficients of the two dimensions were 0.910 and 0.921, respectively. The scale consists of seven positively scored items and seven negatively scored items, with items 4, 5, 6, 7, 9, 10, and 13 being reverse scored. The total score ranges from 0 to 56, with higher scores indicating greater perceived psychological stress. A total score of 0–28 indicates a normal level of perceived stress, that of 29–42 indicates a higher level of perceived stress, and that of 43–56 indicates an excessively high level of perceived stress.

2.8. Statistical analysis

The statistical analysis was conducted using SPSS 23.0 software. General demographic data were described using frequency and percentage. Pearson correlation analysis was used to assess the correlation among workplace violence, job burnout, perceived stress, work environment, and job satisfaction. Regression analysis was used to explore the mediating role of perceived stress between workplace violence and job burnout, and the moderating role of work environment between workplace violence, job satisfaction, and job burnout. To determine whether the normalization coefficient (β) was statistically significant, we used a bidirectional bootstrap 95 % confidence interval (95 %CI) for β based on 5000 Bootstrap samples. The 95 % confidence interval for β does not contain zero, suggesting that the mediated or direct effect is significant ($P < 0.05$).

Ethical approval

The present study was approved by the Ethics Committee of the First Affiliated Hospital of Chongqing Medical University (No: 2022–208). The respondents were informed by the researchers that the collected data would be anonymized and kept confidential. The participants were HCWs of medical teams who had worked in mobile cabin hospitals to aid anti-COVID-19 pandemic efforts in Chongqing.

3. Results

3.1. Descriptive statistics and correlations between variables

A total of 1199 valid questionnaires were recovered from 255 men (21.3 %) and 944 women (78.7 %), among whom 250 were doctors (20.8 %), 854 were nurses (71.2 %), and 95 were other HCWs (8.0 %). In

addition, 693 participants were 30–39 years old (57.8 %), while 335 participants were 40–49 years old (27.9 %). Regarding work experience, 453 participants (37.8 %) had been working for 11–20 years and 383 (31.9 %) had been working for 6–10 years. In addition, 922 (76.9 %) were married, 930 (77.6 %) had a bachelor’s degree, and 657 (54.8 %) held a junior professional title. The other demographic characteristics of the patients are presented in [Table 1](#).

3.2. Correlation analyses

Pearson correlation analysis was used to analyze the relationships between workplace violence, job burnout, perceived stress, work environment, and job satisfaction. The results showed significant positive correlations between workplace violence and job burnout ($r = 0.420$, $P < 0.01$) and between workplace violence and perceived stress ($r = 0.524$, $P < 0.01$). In addition, a significant negative correlation was noted between workplace violence and job satisfaction ($r = -0.254$, $P < 0.01$). There was a significant positive correlation between perceived stress and job burnout ($r = 0.528$, $P < 0.01$) and a significant negative correlation between perceived stress and job satisfaction ($r = -0.397$, $P < 0.01$). Job satisfaction and job burnout also showed a significant negative correlation ($r = -0.300$, $P < 0.01$) ([Table 2](#)).

3.3. Mediating role of perceived stress and moderating effect of the work environment

A hierarchical regression analysis was conducted to examine the relationships between workplace violence, job burnout, perceived stress, and job satisfaction, and the moderating effect of the work environment. The results showed a significant positive moderating effect of the work environment on the relationship between workplace violence and job satisfaction ($\beta = 0.017$, $P < 0.05$). Hence, as the level of the work environment improves, the negative impact of workplace violence on job satisfaction gradually decreases ([Fig. 1](#)). A significant negative moderating effect of the work environment on the relationship between workplace violence and job burnout ($\beta = 0.017$, $P < 0.05$) is also noted. As the level of the work environment improves, the positive impact of workplace violence on job burnout gradually decreases ([Fig. 2](#)).

Workplace violence had a significant positive effect on perceived stress ($\beta = 1.405$, $P < 0.01$). Both workplace violence ($\beta = -0.277$, $P < 0.05$) and perceived stress ($\beta = -0.594$, $P < 0.01$) had significant negative effects on job satisfaction, indicating a significant negative mediating effect of perceived stress on the relationship between workplace violence and job satisfaction. Moreover, both workplace violence ($\beta = 0.707$, $P < 0.05$) and perceived stress ($\beta = 0.567$, $P < 0.01$) had a significant positive effect on job burnout, indicating that perceived stress had a significant positive mediating effect between workplace violence and job burnout ([Table 3](#)).

3.4. Indirect effects of workplace violence on job burnout in different work environments

By using the Process 3.5 plug-in and bootstrap method, 5000 repeated samples were selected to test the indirect impact of workplace violence on job burnout in different work environments. The results showed that in a low-level work environment, the indirect effect of workplace violence on job burnout through job satisfaction was 0.193 (95 %CI: 0.112, 0.280). In contrast, in a high-level work environment, the indirect effect of workplace violence on job burnout through job satisfaction was 0.112 (95 %CI: 0.054, 0.179). The moderated mediation difference was 0.003 (95 %CI: 0.001, 0.007). This result indicates that the work environment negatively moderates the conditional indirect effect of workplace violence on job burnout, i.e., with the improvement of work level, the indirect effect of workplace violence on job burnout through job satisfaction gradually decreases ([Table 4](#)).

Table 1
Social and work characteristics of healthcare workers in mobile cabin hospitals, Chongqing, China, 2022 (n = 1199).

Characteristics	Number (%)
Gender	
Male	255 (21.3)
Female	944 (78.7)
Age (years)	
≤29	97 (8.1)
30–39	693 (57.8)
40–49	335 (27.9)
≥50	74 (6.2)
Working years (years)	
1–5	193 (16.1)
6–10	383 (31.9)
11–20	453 (37.8)
≥21	170 (14.2)
Occupation	
Doctor	250 (20.8)
Nurse	854 (71.2)
Others	95 (8.0)
Marital status	
Married	922 (76.9)
Single/divorced	277 (23.1)
No. of children	
≥1	906 (75.6)
0	293 (24.4)
Education	
College	172 (14.3)
Bachelor's	930 (77.6)
Master's or above	97 (8.1)
Original work department	
Infectious/ Respiratory/Intensive care Unit/Emergency department	421 (35.1)
Others	778 (64.9)
Title	
Primary	657 (54.8)
Intermediate	472 (39.4)
Senior	70 (5.8)
Have you ever participated in the rescue of major public health emergencies	
Yes	762 (63.6)
No	437 (36.4)
Whether or not healthcare workers received psychological intervention during the pandemic	
Yes	462 (38.5)
No	737 (61.5)
Whether or not healthcare workers received support from family members, friends, or colleagues during the pandemic	
Yes	1079 (90.0)
No	120 (10.0)
Satisfaction with the doctor/nurse–patient relationship	
Yes	809 (67.4)
No	390 (32.6)
Whether or not healthcare workers experienced physical discomfort during the pandemic	
Yes	280 (23.4)
No	919 (76.6)

Table 1 (continued)

Characteristics	Number (%)
Sleep quality	
Decreased	573 (47.8)
Ordinary	586 (48.9)
Improved	40 (3.3)
Working area	
Polluted area	1083 (90.3)
Non-polluted area	116 (9.7)
Workload	
Bearable	1004 (83.7)
Overloaded	195 (16.3)
Whether or not infected with COVID-19	
Yes	52 (4.3)
No	1147 (95.7)

4. Discussion

This study used a structural equation model to analyze the relationships among workplace violence, perceived stress, work environment, job satisfaction, and job burnout among HCWs in mobile cabin hospitals in Chongqing, China. Workplace violence can directly affect the perceived stress, job burnout, and job satisfaction of HCWs. It can also influence job burnout through the mediating effect of stress perception and the direct or indirect regulating effect of the work environment. See (Fig. 3).

The results show that, first, workplace violence is positively correlated with job burnout and perceived stress and negatively correlated with job satisfaction. This result is consistent with previous research results (Kim et al., 2018; Duan et al., 2019). Second, perceived stress is negatively correlated with job satisfaction and positively with burnout. This result is in agreement with the previously reported findings (Singh et al., 2023; Liu et al., 2023; Portero de la Cruz et al., 2020). The HCWs reported high levels of perceived stress and burnout and low levels of job satisfaction (Zhang et al., 2023; Rayan et al., 2019). Third, job satisfaction is negatively correlated with burnout. Similar results were reported by Dinibutun (2023). Galanis et al. (2023) pointed out that nurses have reported a higher burnout and lower job satisfaction than doctors. Fear of getting sick and contracting the virus during the COVID-19 pandemic was also a significant factor in reducing the job satisfaction level among HCWs (Labrague and De los Santos, 2021; Abd-Ellatif et al., 2021). Hence, hospital managers should pay attention to the harmful effects of workplace violence and should try to decrease the stress level and increase the job satisfaction level of HCWs.

The results of hierarchical regression analysis showed that perceived stress had a significant negative mediating effect on workplace violence and job satisfaction and a significant positive mediating effect on workplace violence and job burnout. Workplace violence can pose a major threat to the lives, safety, and dignity of HCWs (Wang et al., 2022; Qi et al., 2022). Therefore, workplace violence increases the perceived pressure and decreases the job satisfaction levels of HCWs, resulting in job burnout and a high turnover tendency (Wang et al., 2022; Qi et al., 2022). It may also lead to various psychological problems such as anxiety and depression (Zhao et al., 2018; Chowdhury et al., 2022). A study on the mental health of HCWs in mobile cabin hospitals reported widespread occurrence of perceived stress and high levels of mental illness among HCWs (Gu et al., 2022; Feng et al., 2022). Raja et al. (2022) pointed out that the fear of contracting COVID-19 is positively correlated with burnout and negatively with job satisfaction. Zou et al. (2022) pointed out that occupational stressors are positively correlated with the mental health of frontline medical personnel, and that

Table 2

Means, standard deviations, and correlations among study variables of healthcare workers in mobile cabin hospitals, Chongqing, China, 2022 ($n = 1199$).

	Means	SD	Workplace violence	Job burnout	Perceived Stress	Work Environment	Job satisfaction
Workplace violence	2.56	2.99	1				
Job burnout	28.76	10.71	0.420**	1			
Perceived Stress	22.08	8.03	0.524**	0.528**	1		
Work Environment	69.90	13.70	-0.081**	-0.117**	-0.269**	1	
Job satisfaction	74.22	13.12	-0.254**	-0.300**	-0.397**	0.572**	1

Note: * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$; SD: standard deviation

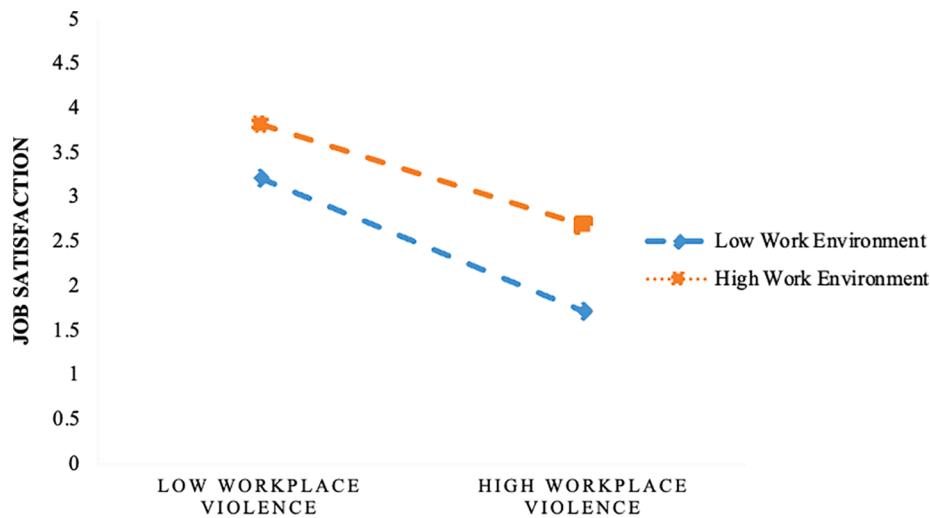


Fig. 1. Moderating effect of work environment on the relationship between workplace violence and job satisfaction of healthcare workers in mobile cabin hospitals, Chongqing, China, 2022 ($n = 1199$).



Fig. 2. Moderating effect of work environment on the relationship between workplace violence and job burnout of healthcare workers in mobile cabin hospitals, Chongqing, China, 2022 ($n = 1199$).

perceived stress plays a mediating role between occupational stressors and mental health. Hence, hospital administrators should pay close attention to the mental health status of HCWs and try their best to reduce the occupational pressure of HCWs.

This study also found that the work environment has a significant positive moderating effect on workplace violence and job satisfaction, and a significant negative moderating effect on workplace violence and

burnout. A Belgian study showed that a good work environment can effectively reduce job burnout and turnover intention of HCWs (Bruyneel et al., 2023). A South African study showed that the work environment is a significant determinant of job satisfaction (Mere et al., 2023). Overwork, poor management, and inappropriate work environment are the key factors responsible for job burnout (Qi et al., 2022; Zhao et al., 2018). Kester et al. also confirmed that hospitals with good

Table 3
Results of regression analysis of workplace violence among healthcare workers in mobile cabin hospitals, Chongqing, China, 2022 (n = 1199).

	Job satisfaction	95 %CI
Workplace violence	-2.213*** (0.489)	-3.083– -1.163
Work Environment	0.488*** (0.028)	0.433–0.543
Workplace violence*Work Environment	0.017* (0.007)	0.004–0.031
	$R^2 = 0.374, F = 237.702, P < 0.01$	
	Job burnout	95 %CI
Workplace violence	2.763*** (0.455)	1.871–3.654
Work Environment	-0.019 (0.026)	-0.070–0.032
Workplace violence*Work Environment	-0.018* (0.006)	-0.031– -0.006
	$R^2 = 0.189, F = 92.941, P < 0.01$	
	Perceived Stress	95 %CI
Workplace violence	1.405***	1.276–1.535
	$R^2 = 0.275, F = 453.440, P < 0.01$	
	Job satisfaction	95 %CI
Workplace violence	-0.277* (0.136)	-0.544– -0.009
Perceived Stress	-0.594*** (0.051)	-0.694– -0.494
	$R^2 = 0.275, F = 453.440, P < 0.01$	
	Job burnout	95 %CI
Workplace violence	0.707*** (0.101)	0.508–0.905
Perceived Stress	0.567*** (0.038)	0.493–0.641
	$R^2 = 0.307, F = 265.506, P < 0.01$	
	Job burnout	95 %CI
Workplace violence	0.685*** (0.101)	0.487–0.882
Perceived Stress	0.520*** (0.038)	0.442–0.598
Job satisfaction	-0.079*** (0.039)	-0.121– -0.037
	$R^2 = 0.315, F = 183.466, P < 0.01$	

Note: * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$, CI: Confidence interval, R^2 :Coefficient of Determination, F :F-value.

Table 4
Indirect Effects of Workplace Violence on Job Burnout in Different Work Environments of healthcare workers in mobile cabin hospitals, Chongqing, China, 2022 (n = 1199).

	Index of moderated mediation	Levels of Work Environment	B (SE)	95 % CI
Workplace violence	0.003 (0.001–0.007)	(-1SD) 56.204	0.193 (0.025)	0.112–0.280
→Job satisfaction		(Mean) 69.902	0.153 (0.050)	0.098–0.211
→Job burnout		(+1SD) 83.600	0.112 (0.032)	0.054–0.179

SD: standard deviation, SE:Standard error, CI:Confidence interval.

work environments tend to better guarantee the overall well-being of HCWs, even under high pressures, and can reduce the incidence of burnout among HCWs (Kester et al., 2021; Lake et al., 2022). Hence, hospital managers should try their best to improve their work environment so as to improve the job satisfaction among HCWs.

This study also explores the indirect moderating effect of the work

environment on workplace violence and burnout through job satisfaction. Wu et al. (2020) showed that the work environment directly affects the occurrence of workplace violence and indirectly affects the burnout and job satisfaction of HCWs. Nantsupawat et al. (2017) also reported that the work environment is significantly related to job satisfaction and burnout, and that job satisfaction is a major factor that regulates the relationship between the work environment and the turnover intention. Hence, hospital managers should improve the work environment and increase the job satisfaction level in attempt to reduce workplace violence and job burnout.

5. Limitations

Firstly, although the mediation model presented herein is based on theory, the cross-sectional study cannot fully infer the causal relationship among different variables. The use of a longitudinal design in future studies may help in achieving more strong conclusions. Secondly, we obtained our research samples from Chongqing, China, which limits the universality of our research results. Therefore, follow-up studies should include cluster sampling to increase the representativeness of the samples. Finally, the study failed to explore the intervention measures for reducing workplace violence in HCWs. As a result, the goal of improving the work environment and reducing job burnout could not be achieved. Hence, intervention measures should be used for a better comparative study in the future.

6. Conclusion

The present study showed that workplace violence is significantly correlated with job burnout among HCWs. Perceived stress is a major mediating factor that affects the relation between workplace violence and job burnout and that between workplace violence and job satisfaction. The work environment has a significant moderating effect on relations between workplace violence and job burnout, and between workplace violence and job satisfaction. The work environment also indirectly moderates the relationship between workplace violence and job burnout through job satisfaction. Hence, it is important for hospital administrators to understand how to protect HCWs from workplace violence, improve their well-being at work, and ensure safe patient care. It is also essential to pay close attention to the perceived stress and job satisfaction of HCWs and provide them with support so as to avoid their adverse impacts on patient safety. Further practices and research initiatives to ensure the safety of HCWs at work are suggested.

Funding

This study was financially supported by Chongqing Key Specialized Quality Project-Clinical Nursing (Grant No. 202336), the Joint Project of Chongqing Science and Technology Committee and Chongqing Health Committee (Grant No. 2020FYYX165), and the Nursing Research Fund of the First Affiliated Hospital of Chongqing Medical University (Grant ID: HLKY2016-05).

CRedit authorship contribution statement

Yan Hu: Writing – review & editing, Writing – original draft, Validation, Project administration, Funding acquisition, Data curation. **Shu Zhang:** Resources, Formal analysis, Data curation. **Jian Zhai:** Supervision, Project administration, Formal analysis, Data curation, Conceptualization. **Delin Wang:** Supervision, Resources, Funding acquisition, Formal analysis, Conceptualization. **Xiangzhi Gan:** Resources, Project administration, Formal analysis, Conceptualization. **Fulan Wang:** Resources, Project administration, Data curation, Conceptualization. **Dan Wang:** Resources, Project administration, Data curation, Conceptualization. **Hongmei Yi:** Writing – review & editing, Writing – original draft, Validation, Supervision, Methodology, Investigation, Formal

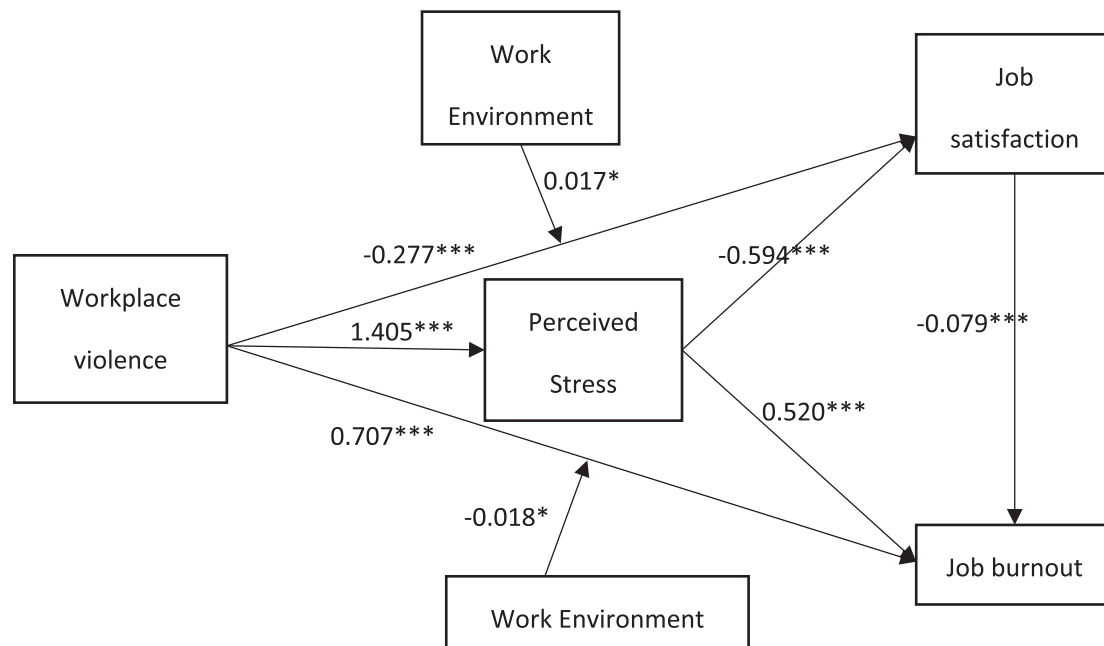


Fig. 3. Conceptual framework of workplace violence and job burnout as well as job satisfaction with perceived stress, both as a mediator and a moderator of healthcare workers in mobile cabin hospitals, Chongqing, China, 2022 ($n = 1199$). Note: $*P < 0.05$, $**P < 0.01$, $***P < 0.001$.

analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Acknowledgments

We thank all the medical personnel involved in the fight against Omicron in Chongqing, China, for their cooperation, support, and assistance during this investigation.

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Further reading

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