

BMJ Open Association between high burn-out and workplace violence among healthcare workers in China: a WeChat-based survey

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ABSTRACT

Objectives This study is conducted to examine whether overall workplace violence (WPV) and its five types are associated with high burn-out among healthcare workers in China.

Design A WeChat-based cross-sectional survey. Snowball sampling was used in this study.

Participants Front-line healthcare workers (N=3706) from 149 cities across 23 provinces in China responded to the survey, and 22 questionnaires were excluded because of incomplete data.

Primary and secondary outcome measures (1) The Chinese Maslach Burnout Inventory-General Survey was used to measure high burn-out. (2) WPV was assessed using the Chinese version of the Workplace Violence Scale. (3) An anonymous self-designed web-based questionnaire consisting of demographic, behavioural and occupational information was used to identify covariates.

Results A total of 3684 front-line healthcare workers (934 physicians and 2750 nurses) were included. Of all participants, 13.3% (491/3193) experienced high burn-out. Adjusted logistic regression revealed that experience of WPV in the past year was associated with high burn-out (OR 2.10, 95% CI 1.69 to 2.62). Healthcare workers who had suffered emotional abuse, threat or verbal sexual harassment were more vulnerable to high burn-out.

Conclusion This study finds that healthcare workers with WPV, especially emotional abuse, threat and verbal sexual harassment, are more likely to experience burn-out. These types of WPV should be considered in interventions to reduce and prevent burn-out for healthcare workers.

INTRODUCTION

Burn-out is defined as a psychological syndrome caused by chronic workplace stress that is not effectively controlled, including emotional exhaustion (feelings of energy depletion or exhaustion), depersonalisation (increased mental distance from your job, or feelings of negativism or cynicism related to your job), and reduced personal accomplishment (reduced professional efficacy).¹ Healthcare workers, especially physicians and nurses in clinical practice, are more likely to

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The strengths of this study include exploration of the association between five specific types of workplace violence (WPV) and high burn-out, and adjustment for potential confounders including demographic, behavioural and occupational factors.
- ⇒ This study did not adjust for psychological factors to further explore the relationship between high burn-out and WPV.
- ⇒ Snowball sampling was used in this study, which would cause the study sample to be not representative.
- ⇒ All indicators were self-reported retrospectively, which may cause recall bias and report errors.

experience high level of burn-out than other working adults.^{2–4} According to a recent systematic review, the prevalence of burn-out among physicians in China ranged from 66.5% to 87.8%.⁵ Numerous factors lead to burn-out among healthcare workers, including excessive workloads, work in shifts, a high working pace, negative workplace experiences, moral conflicts, sleep disorders and perceived job insecurities.^{3 6 7} Furthermore, some uniquely Chinese notions of work such as comprising collectivism, endurance and hard work may lead to burn-out.^{8 9} Several studies have shown that burn-out affects physical and psychological health, resulting in musculoskeletal pain, insomnia, alcohol abuse, depression and even suicidal ideation.^{10–13} In addition, burn-out can also cause negative professional consequences including medical errors and low quality of care,^{12 14} which ultimately leads to adverse impacts on patients' health. Thus, it is crucial to identify risk factors and develop effective strategies to reduce the level of burn-out among healthcare workers.

As defined by the National Institute for Occupational Safety and Health, workplace violence (WPV) is any violent act directed

towards persons at work or on duty.¹⁵ Worldwide, WPV remains one of the most significant occupational hazards in the healthcare sector. A systematic review has shown that physicians are at higher risk of WPV due to understaffing, insufficient security, the mental stress of patients and lacking preventative measures.¹⁶ A bidirectional relationship has been found between WPV-related and work-related distress in a previous longitudinal study.¹⁷ WPV was predicted by work-related distress. Meanwhile, because of their experience with WPV, healthcare workers reported high levels of stress at work in the following years. Burn-out, as a result of work-related distress, also has an association with WPV. Previous studies have shown the established association between burn-out and overall WPV.^{18–20} Multiple systematic reviews concluded that exposure to violence was an independent risk factor for burn-out among healthcare workers.^{21–23} There are five types of WPV, including physical assault (physical contact, such as pushing, biting, beating, spitting), emotional abuse (mistreatment through words, such as swearing, disrespect and disparagement), threats (use of verbal, written or physical force that results in fear of negative consequences), verbal sexual harassment (unwanted sexual remarks or comments) and sexual abuse (unwelcome touching or other sexual acts). In a number of studies, various types of violence have been reported to associate with burn-out among healthcare workers. However, these reports have been focused on a single type of WPV such as verbal violence,²⁴ physical violence²⁰ or harassment.²⁵ In addition, most of these studies may be less robust because they did not adjust for some significant covariates, such as behavioural factors or occupational factors. To our best knowledge, no studies have examined the association between five specific types of WPV and burn-out after adjusting for significant factors in the same healthcare sample. More evidence is needed to deepen our comprehension of the relationship between WPV and burn-out.

To address this gap, our study adjusts for demographic, behavioural and occupational covariates in logistic regression. The purpose of this research was to examine the association of overall WPV and its five types (physical assault, emotional abuse, threat, verbal sexual harassment and sexual abuse) with high burn-out among healthcare workers in China. We hypothesised that healthcare workers who had suffered physical violence and verbal violence were both more vulnerable to high burn-out than those who had not suffered.

METHODS

This was a web-based cross-sectional study. This study was conducted in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology statement.

Participants and procedure

This study was conducted using an anonymous web-based questionnaire (www.wjx.cn). We used snowball sampling

to collect data between 10 January 2019 and 5 February 2019. Forty nurses and physicians in our university hospital were the initial fillers and deliverers of the questionnaire, and their colleagues or classmates were then invited to participate in the online survey, and the link to the questionnaire was spread among the respondents' WeChat (a Chinese social media APP) groups. Medical staff who had worked in comprehensive hospitals for at least 6 months were included in the study. Participants who met the following criteria were excluded: (1) had been on consecutive vacations for more than 3 months in the past year, (2) were not currently working in the front-line departments. Furthermore, we excluded the same IP address which was used more than once to complete the questionnaire. Inclusion and exclusion criteria and a brief introduction to the study were shown on the first page of the questionnaire so that participants could check them and decide whether to continue or quit the survey. Completing the questionnaire implied consent to participate in the study. Ultimately, 3706 front-line healthcare workers from 149 cities across 23 provinces in China participated in the study, and 3684 participants (mean age: 31.6 ± 7.7 years; 3128 (84.9%) were female) completed the questionnaire as required through a quality check. Only with the respondents' informed consent did the questionnaire begin, and the survey was conducted anonymously to protect the respondents' privacy.

Measurements

Burn-out

Burn-out was assessed using the 15-item Chinese Maslach Burnout Inventory-General Survey (CMBI-GS), developed by Liu *et al.*²⁶ and shown good reliability and validity in the previous study.²⁷ CMBI-GS consists of three dimensions of job burn-out: emotional exhaustion (five items), depersonalisation (four items) and reduced personal accomplishment (six items). Each item (eg, It is pressure for me to work all day) consists of a 7-point Likert scale ranging from 0 ('never') to 6 ('daily') based on the frequency of occurrence of the specific job-related feelings of the respondent. The scores of the three dimensions are equal to the average item's score for each dimension (total dimension score divided by the number of items). The total score is the sum of the three dimensions scores and ranges from 0 to 18, with higher scores indicating more severe burn-out. According to the sum score of burnout, the participant can be classified into three levels, including low level (0–8.5), serious level (8.5–14.2) and extremely serious level (14.2–18). In this study, participants with extremely serious level burn-out were defined as a 'high burn-out' case. The result of reliability analysis showed the CMBI-GS was in a high level of internal consistency in the current sample (Cronbach's $\alpha=0.864$).

WPV

WPV was assessed using the Chinese version of the Workplace Violence Scale (WVS), which measured how often

the healthcare worker had encountered WPV in the past year. The scale is composed of five dimensions, including physical assault, emotional abuse, threats, verbal sexual harassment and sexual assault. Responses were on a four-point Likert scale, from 'none' (0), '1 time' (1), '2–3 times' (2) and '≥4 times' (3). The total score is the sum of each dimension, ranging from 0 to 15. The higher the sum score is, the more frequently he or she suffered from WPV. The WVS has shown good reliability and validity (the Cronbach's coefficient was 0.92) in healthcare workers in China.²⁸ In this study, respondents whether suffered five types of WPV were coded as a binary response (0=no; 1=yes).

Covariates

Demographic characteristics included age (coded 1–3 for 'less than 30 years, 30–39 years, equal or more than 40 years'); gender (0=female; 1=male), education (code 1–3 for 'associated degree or below, baccalaureate degree, master's degree or above') and marital status (coded 0 for unmarried and coded 1 for married).

Behavioural variables included exercise (0=no; 1=yes), smoking (0=no; 1=yes), drinking (0=no; 1=yes) and daily sleeping time (coded 1–3 for 'equal or less than 5 hours, 5–7 hours, equal or more than 7 hours').

Occupational variables included the following: (1) profession (coded 0 for nurse and coded 1 for physician); (2) shift work was measured by the question 'Do you need to work in shifts now?' (0=no; 1=yes); (3) level of hospital (coded 1 for primary hospital or community hospital, coded 2 for secondary hospital and coded 3 for tertiary hospital). In China, a hospital's level indicates its scale. For example, the number of beds in a primary or community hospital varies from 20 to 99, those in a secondary hospital range from 100 to 499 and a tertiary hospital has more than 500 beds; (4) work department (1=mental health; 2=intensive care unit; 3=emergency and outpatient; 4=paediatric; 5=gynaecology and obstetrics; 6=internal medicine; 7=surgical department; 8=operating room; 9=general); (5) professional title (coded 1 for primary professional title, coded 2 for intermediate professional title and coded 3 for senior professional title); (6) years of work experience was measured with the question 'How many years have you worked in the hospital?' (coded 1–4 for 'less than 5 years, 5–10 years, 11–20 years and more than 20 years'); (7) weekly working time was measured with the question 'In the past 12 months, how many hours per week did you work on average' (coded 1–3 for 'less than 40 hours, 40–50 hours and more than 50 hours').

Statistical analyses

Descriptive statistics were presented as numbers and percentages for demographic, behavioural and occupational variables, and the rates of overall WPV and its specific types. χ^2 tests were used to compare the characteristics of the sample according to burn-out categories (non-high burn-out and high burn-out). Binary logistic regression analysis was used to examine the association

between high burn-out and WPV. We presented the crude effects with only associated factors of interest included in model 1. Then we adjusted for demographics (age, gender, education and marital status) (model 2), and further adjusted for behavioural variables (exercise, smoking, drinking and daily sleeping time) (model 3). Model 4 finally further adjusted for occupational variables (profession, shift work, level of hospital, work department, professional title, years of work experience and weekly working time). The association between five types of WPV and high burn-out was evaluated using the adjusted logistic regression. We used SPSS V.24 to perform all statistical analyses (IBM SPSS Statistics for MacOS).

Patient and public involvement

None.

RESULTS

After excluding 22 incomplete data, a total of 3684 front-line healthcare workers (25.4% physicians and 74.6% nurses) from all provinces in mainland China were included. 84.9% were female and 65.8% were married. Nearly 50% of participants were younger than 30 years old, with a mean age of 31.6 ± 7.7 years (not shown in tables). Of the respondents, a majority (78.7%) had attained a bachelor's degree or above, 69.1% would not do exercise and 73.3% needed to work in shifts. The demographic, behavioural and occupational characteristics of participants are shown in [table 1](#).

The prevalence and characteristic of high burn-out

The rate of high burn-out among healthcare workers was 13.3% (491/3684). There were significant differences in the prevalence of high burn-out by demographic, behavioural and occupational characteristics ([table 1](#)). Among three levels of education, healthcare workers with master's degree or above were least vulnerable to high burn-out (9.4%, $p=0.17$). Medical staffs who did not exercise had a higher prevalence of high burn-out (15.6% vs 8.2%, $p<0.001$) than medical staff who did exercise. Healthcare workers sleeping less than 5 hours per day were more vulnerable to high burn-out (19.1%, $p<0.001$). Shift workers appeared to be more vulnerable to high burn-out (15.7% vs 6.9%, $p<0.001$) than non-shift workers. Healthcare workers working in secondary hospitals were the most likely to experience high burn-out (16.0%, $p=0.002$), followed by healthcare workers in tertiary hospitals (12.7%) and in primary or community hospitals (7.1%). Physicians and nurses working in paediatrics were more vulnerable to high burn-out (23.6%, $p<0.001$). Healthcare workers working more than 50 hours per week had the highest prevalence of high burn-out (19.2%, $p<0.001$) compared with the other groups classified by the weekly working time.

Table 1 Characteristics of healthcare workers, stratified by high burn-out status (N=3684)

Characteristics, n (%)	Total (N=3684)	Non-high burn-out (n=3193)	High burn-out (n=491)	P value
Age				0.037
< 30 years	1780 (48.3)	1525 (85.7)	255 (14.3)	
30–39 years	1306 (35.5)	1131 (86.6)	175 (13.4)	
≥ 40 years	598 (16.2)	537 (89.8)	61 (10.2)	
Gender				0.578
Female	3128 (84.9)	2707 (86.5)	421 (13.5)	
Male	556 (15.1)	486 (87.4)	70 (12.6)	
Education				0.017
Associate degree or below	786 (21.3)	667 (84.9)	119 (15.1)	
Bachelor's degree	2461 (66.8)	2130 (86.6)	331 (13.4)	
Master's degree or above	437 (11.9)	396 (90.6)	41 (9.4)	
Marital status				0.678
Unmarried	1261 (34.2)	1097 (87.0)	164 (13.0)	
Married	2424 (65.8)	2096 (86.5)	327 (13.5)	
Exercise				<0.001
No	2546 (69.1)	2148 (84.4)	398 (15.6)	
Yes	1138 (30.9)	1045 (91.8)	93 (8.2)	
Smoking				0.945
No	3327 (90.3)	2884 (86.7)	443 (13.3)	
Yes	357 (9.7)	309 (86.6)	48 (13.4)	
Drinking				0.188
No	2272 (61.7)	1956 (86.1)	316 (13.9)	
Yes	1412 (38.3)	1237 (87.6)	175 (12.4)	
Sleeping time				<0.001
≤5 hours/day	712 (19.3)	576 (80.9)	136 (19.1)	
5–7 hours/day	1478 (40.1)	1265 (85.6)	213 (14.4)	
≥7 hours/day	1494 (40.6)	1352 (90.5)	142 (9.5)	
Profession				0.201
Nurse	2750 (74.6)	2372 (86.3)	378 (13.7)	
Physician	934 (25.4)	821 (87.9)	113 (12.1)	
Shift work				<0.001
No	984 (26.7)	916 (93.1)	68 (6.9)	
Yes	2700 (73.3)	2277 (84.3)	423 (15.7)	
Level of hospital				0.002
Primary/community hospital	156 (4.2)	145 (92.9)	11 (7.1)	
Secondary hospital	987 (26.8)	829 (84.0)	158 (16.0)	
Tertiary hospital	2541 (69.0)	2219 (87.3)	322 (12.7)	
Work department				<0.001
Mental Health	444 (12.1)	414 (93.2)	30 (6.8)	
Intensive care unit	236 (6.4)	197 (83.5)	39 (16.5)	
Emergency and outpatient	308 (8.4)	256 (83.1)	52 (16.9)	
Paediatric	165 (4.5)	126 (76.4)	39 (23.6)	
Gynaecology and obstetrics	217 (5.9)	189 (87.1)	28 (12.9)	
Internal medicine	969 (26.3)	794 (81.9)	175 (18.1)	
Surgical department	743 (20.2)	652 (87.8)	91 (12.2)	
Operating room	134 (3.6)	123 (91.8)	11 (8.2)	
Diagnosis and subsidiary	326 (8.8)	308 (94.5)	18 (5.5)	
General	142 (3.9)	134 (94.4)	8 (5.6)	

Continued

Table 1 Continued

Characteristics, n (%)	Total (N=3684)	Non-high burn-out (n=3193)	High burn-out (n=491)	P value
Professional title				0.028
Primary	2269 (61.6)	1940 (85.5)	329 (14.5)	
Intermediate	1021 (27.7)	906 (88.7)	115 (11.3)	
Senior	394 (10.7)	347 (88.1)	47 (11.9)	
Work experience				<0.001
<5 years	1382 (37.5)	1213 (87.8)	169 (12.2)	
5–10 years	1054 (28.6)	872 (82.7)	182 (17.3)	
11–20 years	766 (20.8)	669 (87.3)	97 (12.7)	
> 20 years	482 (13.1)	439 (91.1)	43 (8.9)	
Working time				<0.001
< 40 hours/week	1012 (27.5)	919 (90.8)	93 (9.2)	
40–50 hours/week	2140 (58.1)	1844 (86.2)	296 (13.8)	
> 50 hours/week	532 (14.4)	430 (80.8)	102 (19.2)	
WPV				<0.001
No	1605 (43.6)	1478 (92.1)	127 (7.9)	
Yes	2079 (56.4)	1715 (82.5)	364 (17.5)	
Physical assault				0.087
No	3098 (84.1)	2698 (87.1)	400 (12.9)	
Yes	586 (15.9)	495 (84.5)	91 (15.5)	
Emotional abuse				<0.001
No	1895 (51.4)	1738 (91.7)	157 (8.3)	
Yes	1789 (48.6)	1455 (81.3)	334 (18.7)	
Threat				<0.001
No	2689 (73.0)	2371 (88.2)	318 (11.8)	
Yes	995 (27.0)	822 (82.6)	173 (17.4)	
Verbal sexual harassment				<0.001
No	3087 (83.8)	2706 (87.7)	381 (12.3)	
Yes	597 (16.2)	487 (81.6)	110 (18.4)	
Sexual assault				0.064
No	3387 (91.9)	2946 (87.0)	441 (13.0)	
Yes	297 (8.1)	247 (83.2)	50 (16.8)	

WPV, workplace violence.

WPV and high burn-out

Healthcare workers who had experienced WPV in the past year were more vulnerable to high burn-out (17.5% vs 7.9%, $p<0.001$) than those who had not experienced it (table 1). Table 2 shows the result of the association between WPV and high burn-out by logistic regression. The association between WPV and high burn-out was significant in the unadjusted model (OR 2.47, 95% CI 2.00 to 3.06). In the fully adjusted model (model 4), adjustment for demographic, behavioural and occupational covariates reduced the strength of these associations but did not fully attenuate them (OR 2.03, 95% CI 1.62 to 2.55).

Five types of WPV and high burn-out

Table 3 presents the association between five types of WPV and high burn-out. After adjusting for demographic,

behavioural and occupational factors, both emotional abuse (OR 2.08, 95% CI 1.67 to 2.58), threat (OR 1.41, 95% CI 1.14 to 1.76) and verbal sexual harassment (OR 1.55, 95% CI, 1.20 to 1.99) were statistically significantly associated with high burn-out when they were both included as independent variables in the same model.

DISCUSSION

Using a sample of Chinese healthcare workers, we found that WPV was independently associated with high burn-out after adjusted for demographic, behavioural and occupational factors. Healthcare workers who suffered from emotional abuse, threat or verbal sexual harassment were more likely to experience high burn-out.

Our results found that healthcare workers were at high risk of job burn-out and WPV. In this study, 13.3%

Table 2 Results of logistic regression analysis of associations between WPV and high burn-out (N=3684)

	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 4 OR (95% CI)
WPV	2.47 (2.00 to 3.06)***	2.49 (2.01 to 3.09)***	2.29 (1.84 to 2.84)***	2.03 (1.62 to 2.55)***
Age				
< 30 years		1	1	1
30–39 years		0.84 (0.65 to 1.07)	0.83 (0.65 to 1.07)	0.86 (0.61 to 1.22)
≥40 years		0.60 (0.43 to 0.84) **	0.68 (0.48 to 0.97) *	0.96 (0.48 to 1.92)
Gender (male)		0.96 (0.73 to 1.27)	1.07 (0.76 to 1.49)	1.04 (0.71 to 1.52)
Education				
Associate degree or below		1	1	1
Baccalaureate degree		0.83 (0.66 to 1.05)	0.83 (0.65 to 1.05)	0.84 (0.65 to 1.08)
Master's degree or above		0.61 (0.41 to 0.89) *	0.63 (0.43 to 0.93) *	0.63 (0.40 to 1.00)*
Married		1.32 (1.03 to 1.69) *	1.33 (1.03 to 1.71) *	1.15 (0.88 to 1.52)
Exercise			0.57 (0.44 to 0.73) ***	0.64 (0.50 to 0.83)**
Smoking			0.96 (0.66 to 1.45)	0.96 (0.64 to 1.44)
Drinking			0.85 (0.68 to 1.06)	0.91 (0.73 to 1.14)
Sleeping time				
≤ 5 hours/day			1	1
5–7 hours/day			0.72 (0.57 to 0.92) **	0.76 (0.59 to 0.98)*
≥7 hours/day			0.49 (0.38 to 0.64) ***	0.54 (0.42 to 0.71)***
Profession (physician)				1.08 (0.78 to 1.49)
Shift work				2.10 (1.54 to 2.86)***
Level of hospital				
Primary/community hospital				1
Secondary hospital				1.16 (0.56 to 2.42)
Tertiary hospital				1.01 (0.49 to 2.08)
Work department				
Mental health				1
Intensive care unit				2.82 (1.65 to 4.82)***
Emergency and outpatient				3.02 (1.83 to 4.99)***
Paediatric				4.14 (2.41 to 7.12)***
Gynaecology and obstetrics				2.06 (1.17 to 3.64)*
Internal medicine				3.03 (1.97 to 4.65)***
Surgical department				1.98 (1.26 to 3.12)**
Operating room				1.52 (0.72 to 3.22)
Diagnosis and subsidiary				1.18 (0.63 to 2.19)
General				1.18 (0.49 to 2.88)
Professional title				
Primary				1
Intermediate				0.87 (0.61 to 1.22)
Senior				1.25 (0.72 to 2.17)
Work experience				
< 5 years				1
5–10 years				1.53 (1.11 to 2.09)*
11–20 years				1.41 (0.88 to 2.26)
>20 years				1.19 (0.55 to 2.57)
Working time				
< 40 hours/week				1

Continued

Table 2 Continued

	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 4 OR (95% CI)
40–50 hours/week				1.41 (1.09 to 1.83)**
> 50 hours/week				1.72 (1.22 to 2.41)**

Model 1: Independent variable of interest.

Model 2: Model 1+demographic covariates (age, gender, education, marital status).

Model 3: Model 2+behavioural covariates (exercise, smoking, drinking, daily sleeping time).

Model 4: Model 3+occupational covariates (profession, shift work, level of hospital, work department, professional title, years of work experience, weekly working time).

The bold values represent statistically significant ORs and 95% CIs.

*p<0.05, **p<0.005, ***p<0.001.

WPV, workplace violence.

of participants experienced high burn-out. Previous Chinese studies have shown that 38.8% of intensivists²⁹ and 38.4% of psychiatrists,³⁰ as well as half of nurses,³ reported experiencing severe burn-out. Furthermore, a recent systematic review and meta-analysis, involving 45 538 nurses in 49 countries, has shown the overall pooled prevalence of burn-out was 11.2%.³¹ Our findings showed similar trends as previous studies. The incidence of WPV among healthcare workers in China was higher than that in other countries. Worldwide, the incidence of WPV among healthcare professionals ranges from 4% to 37%.³² Lu *et al*³³ have found that the overall prevalence of WPV is 62.4% among 81 771 Chinese healthcare professionals in a recent meta-analysis involving 44 studies. Similar to this study, our results found that more than half of the respondents have suffered WPV at least once in the past year. There are a number of reasons why WPV may be higher in China. A study of serious WPV events over a 14-year period suggests that emotional disorders, non-satisfactory treatment outcomes and unreasonable medical demands may be three causes of WPV against healthcare providers in China.³⁴ In addition, according

to existing studies regarding the healthcare work environment in China, factors such as insufficient financial support for healthcare, lack of legal tools, mismatches between medical resources and patients' needs, lack of supportive organisational interventions, poor physician-patient communication and underdeveloped mental healthcare practices may all contribute to the high incidence of WPV in China.^{34 35}

Our findings suggested that healthcare workers who experienced WPV at least once in the last year were at higher risk of burn-out, which is consistent with previous studies.^{24 36} Specifically, Erdur *et al*²⁴ used the Maslach Burnout Inventory to assess the burn-out symptoms among 174 physicians working in the emergency department in Turkey, and they found that overall WPV was significantly associated with emotional exhaustion and depersonalisation after adjusting for four covariates (age, gender, work place and hobbies). The main difference between our study and the previous study is that the prior one had a small sample size and only included physicians in emergency departments, which means our results have better generalisability. Duan *et al*³⁶ used MBI-GS and a Chinese WPV questionnaire and they found that WPV was positively correlated with job burn-out among 1257 Chinese physicians, which is similar to our results. However, this study did not adjust for any covariates. Our study considered more risk factors of burn-out which were proven by evidence as covariates, therefore, our study provided more robust evidence that WPV was associated with high burn-out. One possible explanation for the association between WPV and burn-out is that WPV is associated with some adverse health outcomes, including work-related distress, sleep disorder and other psychological distress, all contributing to the risks of high burn-out.^{7 37–39}

Furthermore, consistent with our study hypothesis, we found that verbal violence including emotional abuse, threat and verbal sexual harassment were statistically significantly associated with higher risks of high burn-out after adjusting for all covariates. However, contrary to our hypothesis, high burn-out was not associated with physical violence, such as physical assault and sexual assault. As opposed to our study, Hacer and Ali¹⁸ found a significant association between physical violence and burn-out.

Table 3 Adjusted logistic regression examining the associations between five types of WPV and high burn-out (N=3684)

Five types of WPV	OR (95% CI)
Physical assault	1.29 (0.98 to 1.70)
Emotional abuse	2.08 (1.67 to 2.58)***
Threat	1.41 (1.14 to 1.76)**
Verbal sexual harassment	1.55 (1.20 to 1.99)**
Sexual assault	1.29 (0.92 to 1.82)

All associations adjusted for demographic (age, gender, education, marital status), behavioural (exercise, smoking, drinking, daily sleeping time) and occupational characteristics (profession, shift work, level of hospital, work department, professional title, years of work experience, weekly working time).

The bold values represent statistically significant ORs and 95% CIs.

p<0.005, *p<0.001.

WPV, workplace violence.

These inconsistent findings may be explained by the different measures of physical violence (overall physical violence vs physical assault and sexual assault), data analysed (Shapiro-Wilks test vs adjusted logistic regression) and sample sizes (N=310 vs 3684). However, their study also found that verbal violence has a significant negative effect on burn-out, partially supporting our result. Our findings shed light on that verbal violence may be a target of intervention to prevent and reduce burn-out among healthcare workers.

Today, China is facing a serious shortage of healthcare workers. A lack of financial, human and policy support has led to an increase in workload and work hours among Chinese healthcare workers. This has also led to disputes and verbal violence among some patients who are dissatisfied with healthcare services.^{35–40–42} However, healthcare workers often do not have timely and effective interventions to protect themselves and punish perpetrators after experiencing verbal violence. With the increase in WPV in the medical field during the COVID-19 pandemic, the protection of healthcare workers has gained widespread attention around the world.^{38–43} India and the USA have both introduced entirely new laws and regulations to address the problem.⁴⁴ Although China has approved a law to protect healthcare workers from verbal violence, it has had little impact. In these situations, governments can enact more draconian laws and statutory measures. In addition, hospitals can develop strategies for prevention and intervention reform to protect their staff.

From a public health and healthcare policy standpoint, our study has important implications for the prevention of burn-out in front-line healthcare workers. Our findings point to WPV, especially verbal violence, leading to a high level of burn-out. Thus, it is imperative for policymakers to focus on verbal violence which is more difficult to notice than physical violence. From a practical perspective, mental health support should increase the attention of healthcare workers who have suffered verbal violence from patients, their family and coworkers. In addition, future research could develop a simple group intervention for massive front-line healthcare workers to reduce their work-related distress resulting from verbal violence to prevent burn-out.

Limitations

There are several limitations to this study. This study used the retrospective approach to collect data, which might have led to recall and report bias. This study sample consists of 3684 doctors and nurses from 23 provinces in China, however, it is small compared with the number of Chinese healthcare workers. In addition, this study used snowball sampling. Both sample size and sampling methods would cause the study sample to be not representative. Previous studies have shown that there are interactions between WPV, burn-out and other negative psychological outcomes.^{45–46} In this study, psychological factors were not adjusted to further explore the association between WPV and high burn-out among healthcare

workers. Further research is needed to determine whether psychological factors influence the relationship between WPV and burn-out.

CONCLUSION

For the Chinese healthcare system, burn-out remains a special concern. Based on a sample of healthcare workers in China, we found that emotional abuse, threat and verbal sexual harassment were associated with high burn-out. Therefore, for future public health policy and intervention studies on preventing and reducing burn-out in healthcare workers, WPV, especially verbal violence, should be taken into account.

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