




# BMJ Open Mediating role of coping styles on anxiety in healthcare workers victim of violence: a cross-sectional survey in China hospitals

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## ABSTRACT

**Objective** The purposes of this study were to evaluate the rate of workplace violence in county hospitals in China and its impact on healthcare workers and to explore the relationship between hospital violence, coping styles and anxiety to provide effective procedures for reducing anxiety among healthcare workers.

**Methods** The study used stratified sampling to select 1200 healthcare workers from 30 county hospitals in China to conduct a questionnaire survey. Of these, 1030 were valid questionnaires, and the effective response rate was 85.83%. We collected demographic characteristics of our participants and administered the following scales to them: Workplace Violence, Trait Coping Style, Self-rating Anxiety. Data were statistically analysed.

**Results** The results showed that 67.28% of healthcare workers in county hospitals in China had experienced workplace violence in the previous 12 months, with prevalent verbal violence (66.12%) followed by physical violence (15.24%). Workplace violence in hospitals was negatively related to positive coping ( $r=-0.091$ ,  $p<0.01$ ) but positively related to negative coping ( $r=0.114$ ,  $p<0.001$ ) and anxiety ( $r=0.298$ ,  $p<0.001$ ). Positive and negative coping was negatively ( $r=-0.085$ ,  $p<0.01$ ) and positively ( $r=0.254$ ,  $p<0.001$ ) associated with anxiety respectively. Positive and negative coping influenced both hospital workplace violence and anxiety in healthcare workers who were victims of violence. Compared with positive coping, the mediating effect of negative coping was stronger (95% CI  $-0.177$  to  $-0.006$ ).

**Conclusions** The incidence of workplace violence among healthcare workers in county-level hospitals in China is relatively high, and there is a correlation between hospital violence, coping styles and anxiety. Positive and negative coping play a mediating role in the impact of hospital violence on healthcare workers' anxiety. Therefore, hospital administrators should actively promote healthcare workers' transition to positive coping strategies and minimise the negative impact of anxiety on them.

## INTRODUCTION

At 6 o'clock on 24 December 2019, a physician in the emergency department of Beijing Civil Aviation General Hospital was malignantly injured by a patient's family member during

## Strengths and limitations of this study

- This study explored the mechanism of healthcare workers' coping style on both hospital violence and anxiety they suffered.
- This study points out the direction of intervention for reducing the anxiety in healthcare workers suffering from hospital violence.
- This study cannot allow us to infer causality between variables due to its cross-sectional research design.
- The assessment is based entirely on self-reports, which may cause recall bias.
- The sample size is relatively small, and it is necessary to continue to expand the sample and conduct longitudinal surveys.

normal diagnosis and treatment, leading to a serious neck injury. Although she was rescued, she later died from the injury.<sup>1</sup> Coincidentally, the director of Ophthalmology of Chaoyang Hospital in Beijing was seriously injured by a patient, and two doctors in the First Affiliated Hospital of Zhengzhou University were slashed with knives by patients. In China's medical institutions, there are still frequent incidents of violent injuries to doctors by patients or their families. The occurrence of a series of violent injuries to healthcare workers has once again raised public awareness, and hospital workplace violence has become a focus of attention. The International Labor Organization reports that health services are the industry with the highest risk of workplace violence, which has become a global public health problem.<sup>2 3</sup>

With the continuous occurrence of hospital violence, the Chinese government has realised the magnitude of the problem and has taken a series of measures to effectively prevent and control its occurrence. The implementation of these measures has made the incidence of hospital violence in China lower than before;

however, it is still higher than that of other countries and which still has a serious negative impact on the work and life of healthcare workers. Research shows that between 2013 and 2016, as many as 459 cases appeared in Chinese courts due to violent wounding and killing of healthcare workers.<sup>4</sup> China's county hospitals are responsible for the diagnosis and treatment of most patients in rural areas. As an important part of China's hierarchical diagnosis and treatment system, their status and role are irreplaceable. A clear understanding of the workplace violence experienced by healthcare workers in county hospitals in China, the impact of this on their mental health and the role played by coping styles in managing workplace violence and anxiety in hospitals can provide a basis for decision-making by relevant departments and managers to improve the management of violent incidents and to take effective measures to safeguard the physical and mental health of medical workers.

### Anxiety

If healthcare workers feel anxious, it may damage their physical and mental health as well as reduce the quality of the services provided, potentially endangering the health and safety of patients. The consequences of this should not be underestimated. Excessive and persistent anxiety is often accompanied by physical symptoms, such as headache, sweating, fatigue or exhaustion;<sup>5</sup> all these symptoms can negatively impact individuals' work and life. Previous research has shown that anxiety affects an individual's life satisfaction,<sup>6</sup> job satisfaction<sup>7</sup> and quality of life.<sup>8</sup>

### Coping styles

Coping is defined as a set of cognitive and behavioural strategies that individuals use to manage the internal and external needs of stress situations.<sup>9</sup> Coping styles can either be positive or negative. The former refers to a positive response that focuses on constructive actions aimed at changing the stressful situation and is typically associated with problem-solving behaviours and effective mood regulation; the latter is a passive style that focuses on negative assessment and emotional expression, avoiding stressful situations and social isolation.<sup>10</sup> At work, individuals who adopt a proactive approach will not regard risks, demands and opportunities as potential threats, injuries or losses. Instead, they see harsh environments as personal challenges that can generate positive emotions and behaviours, thereby improving the outcome of the event.<sup>11</sup> In this sense, they are not passive but active because they take constructive action to create opportunities for growth. Wang *et al.*<sup>12</sup> found that positive and negative coping have a great impact on the psychological stress level of Chinese healthcare workers and play a mediating role in the perception of stress and psychological distress. Through an investigation of Chinese nursing staff, Ding *et al.*<sup>10</sup> found that negative coping plays a mediating role between self-efficacy and emotional failure between optimism and emotional exhaustion and has a negative effect on the degree of emotional failure and personality

disintegration of Chinese nursing staff. The results of Zhou *et al.*<sup>13</sup> show that coping styles partly mediate the relationship between job burnout and anxiety symptoms in Chinese doctors.

As an important social and health problem in China today, addressing the question of hospital violence plays a significant role in maintaining the physical and mental health of healthcare workers, easing the tension between doctors and patients and building a harmonious and orderly medical and therapeutic order. The frequent occurrence of violence in the workplace at county-level hospitals, which form an important part of China's health service system, has damaged the physical and mental health of healthcare workers who have undertaken the heavy responsibility of medical and healthcare. This has produced negative emotions and had a significant negative impact on the quality of daily medical services. Previous studies have shown that different coping styles have different effects on the emotions of individuals. However, for healthcare workers suffering from workplace violence in hospitals, the effect of different coping styles on the anxiety of healthcare workers is still unknown. The role of coping styles as a mediator between hospital violence and anxiety has not been previously researched.

The purposes of this study were to evaluate the rate of workplace violence in county hospitals in China and its impact on healthcare workers and to explore the relationship between hospital violence, coping styles and anxiety to provide effective procedures for reducing anxiety among healthcare workers.

Based on previous theoretical and empirical studies, this study puts the following assumptions forward:

Hypothesis 1: There is a correlation between hospital violence and the anxiety of healthcare workers.

Hypothesis 2: There is a correlation between trait coping style (positive coping style and negative coping style) and anxiety among healthcare workers.

Hypothesis 3: Trait coping styles play a partially mediating role between hospital violence and the anxiety of healthcare workers.

## MATERIALS AND METHODS

### Data collection

From 10 July 2018 to 10 October 2018, a stratified sampling method was adopted to select 30 county-level hospitals in China, each of which was sampled at a rate of 30% for clinicians and nurses, using the relevant scales for cross-sectional surveys. A total of 1200 healthcare workers were interviewed. All researchers received uniform training and cleared the assessment before the investigation began. The study was conducted with the permission of the relevant departments, hospital managers and the interviewees themselves. Informed consent forms were signed before the survey began. A total of 1200 questionnaires were distributed, of which 1030 were valid, and the effective response rate of the

questionnaire was 85.83% (incomplete questionnaires with obvious errors were deemed to be invalid). The inclusion criteria for participants were the following: (1) clinical doctors and nurses working in the hospital, (2) with almost 1 year of work experience and (3) who accepted voluntary participation in the study. The exclusion criteria were: (1) medical personnel who do not want to participate in the investigation and (2) advanced medical personnel and interns.

## Measurements

### Demographic characteristics

Self-made questionnaires were used to collect demographic characteristics of healthcare workers, including gender, age, education, marital status, job title, nature of work, department, years of service and daily contact with patients.

### Workplace violence scale

The study used the Workplace Violence Scale, which was jointly prepared by the International Labor Organization, the International Council of Nurses, the WHO and the International Public Service Organization to assess healthcare workers' experiences with workplace violence.<sup>14</sup> The scale contains three dimensions: verbal violence, physical violence and sexual harassment. Verbal violence includes verbal attacks (insults or the use of other words that undermine human dignity—whether face-to-face encounters or telephone conversations, letters, networks or leaflets—but no physical contact); physical violence includes physical contact or assault with objects (including punching, kicking, slapping, stabbing, pushing, biting, throwing, twisting arms or pulling hair) as well as sexual harassment/violence (sexual assault, rape or attempted rape). Each item is scored on a 4-point scale, reflecting the frequency of exposure of respondents to hospital violence (0=0 times, 1=1 time, 2=2 or 3 times, 3=more than 3 times). The lowest score was 0 and the highest was 27. The higher the total score, the higher the frequency of violence. The scale has good reconfidence and effectiveness and has been widely used in China.<sup>15–17</sup> The Cronbach's alpha in this study was 0.871.

### Trait Coping Style Questionnaire

The Chinese version of the Trait Coping Style Scale was used to measure the coping styles of healthcare workers in county-level hospitals in China. The scale contains two dimensions: positive coping and negative coping and each dimension includes a total of 10 items. Each item is scored on a 5-point Likert scale, ranging from 1 (absolutely not) to 5 (absolutely). The higher the score for each dimension, the more likely respondents are to adopt this coping style. The questionnaire has been widely used in previous studies and has good reliability and validity.<sup>18–20</sup> In this study, the

Cronbach's alpha coefficients of positive coping and negative coping were 0.790 and 0.776, respectively.

### Self-rating Anxiety Scale (SAS)

This study used the Chinese SAS to measure healthcare workers' anxiety. The English version of the scale was compiled by Zung in 1971<sup>21</sup> and localised by Chinese scholars in 1981, making it appropriate to use in the Chinese population;<sup>22</sup> it has since been widely used.<sup>23–25</sup> This scale contains a total of 20 items measured on a 4-point Likert scale, ranging from 1 (none or a little of the time) to 4 (good all of the time). The standard score for the scale was obtained by multiplying the original score of 20 items by 1.25. A higher score indicates a higher level of anxiety. A total standard score  $\geq 50$  points is considered anxious.<sup>26 27</sup> Cronbach's alpha in the current study was 0.865.

## Data analysis

### Preliminary analysis

We used EpiData 3.1 for double data entry to ensure data quality. Blank questionnaires, those with large areas of missing information or incorrect questionnaires, were eliminated. The normal distributions of the continuous variables were verified using Shapiro-Wilk test. Descriptive statistics were used to analyse the demographic characteristics of the healthcare workers surveyed. We used independent sample t-test or single-factor variance and multivariate linear regression analysis to compare the differences of individual anxiety state of different demographic variables. Pearson correlation analysis was used to explore the relationship among hospital violence, positive coping, negative coping and anxiety.

### Mediation analysis

The intermediary mechanism was calculated using Hayes' SPSS macro PROCESS.<sup>28</sup> The mediation analysis was based on Model 4 and bootstrapping (5000 bootstrap samples) using a 95% CI. The variables with significant correlations in single-factor analysis act as covariate variables, with hospital violence as the independent variable (X), positive coping (M1) and negative coping (M2) as mediating variables and anxiety as a dependent variable (Y). The macro PROCESS is used to calculate and test the total, direct and indirect effect. The effect is considered significant when the 95% CI does not include 0. All research variables were tested for multicollinearity. The above statistical analysis was performed using SPSS V.25.0.  $P < 0.05$  was considered statistically significant.

### Patient and public involvement

Patients and the public were not involved in the design and development of the study. However, academic discussions with previous scholars and the status of anxiety and hospital violence of healthcare workers have jointly contributed to the design and implementation of this study.

## RESULTS

### Sample population description and the difference between participants' characteristics and anxiety scores

In terms of demographic characteristics, the majority of respondents were women (78.25%), under 40 years old (75.73%), mainly undergraduate (57.67%), the most professional title was primary (44.85%) and the vast majority were nursing staff (60.78%); most of the respondents had more than 8 hours of contact with patients per day (54.85%) (table 1).

The results of the study showed that gender ( $t=3.810$ ,  $p<0.001$ ), age ( $F=6.557$ ,  $p<0.001$ ), marital status ( $F=6.035$ ,  $p=0.014$ ), profession ( $F=6.035$ ,  $p=0.014$ ), department ( $F=4.195$ ,  $p=0.015$ ), work experience (years) ( $F=4.753$ ,  $p=0.001$ ) and the anxiety score were significantly correlated (table 1).

### Analysis of the factors that influence healthcare workers' anxiety

The results of the study show that female healthcare workers are less anxious than male healthcare workers ( $B=-2.72$ ,  $p=0.004$ ), and healthcare workers aged 31–40 are more anxious than younger healthcare workers ( $B=2.83$ ,  $p=0.008$ ) (table 2).

### Hospital violence experienced by healthcare workers

As can be seen from table 3, 67.28% of the respondents in county hospitals in China have suffered from hospital violence in the past 12 months. Of these, 66.12% were the victims of verbal violence, 15.24% suffered physical violence and the smallest group suffered from sexual harassment (4.56%).

### The relationship between hospital violence and anxiety in healthcare workers

The survey showed that 693 out of 1030 healthcare workers had experienced hospital violence, and 233 of them had anxiety symptoms, accounting for 74.92%. This was significantly higher than the proportion of 337 people who did not experience anxiety symptoms in violent healthcare situations (25.08%) (table 4).

### Correlations between study variables

Table 5 describes the mean value, SD of each study variable and Pearson correlation coefficient between the variables. The results of the study showed that the degree of violence was negatively correlated with positive coping ( $r=-0.091$ ,  $p=0.003$ ) and positively correlated with negative coping ( $r=0.114$ ,  $p<0.001$ ); positive coping was negatively correlated with anxiety ( $r=-0.085$ ,  $p=0.006$ ); negative coping was positively correlated with anxiety ( $r=0.254$ ,  $p<0.001$ ) and the degree of violence was positively correlated with anxiety ( $r=0.298$ ,  $p<0.001$ ).

### Mediation regression models of study variables

Mediation analysis (incorporating meaningful demographic characteristics in the single-factor test results: gender, age, marital status, job title, job nature, work department and working hours into the model) results

show that the direct effects of hospital violence on positive and negative coping are  $-0.232$  and  $0.308$ , respectively; the direct effect of positive coping on anxiety was  $-0.176$  and the direct effect of negative coping on anxiety was  $0.413$ ; the direct effect of hospital violence on anxiety was  $0.910$ . Positive and negative coping plays a partial mediating role between the degree of hospital violence and anxiety, and the mediating effect of negative coping is stronger than that of positive coping (effect= $-0.0865$ , 95% CI  $-0.1771$  to  $-0.0063$ ) (figure 1 and table 6).

## DISCUSSION

### Gender and age are the factors that influence healthcare workers' anxiety the most

The results of our study suggest that among healthcare workers in Chinese county-level hospitals, men are more prone to anxiety than women. This is inconsistent with the findings of previous studies, which found that women are more vulnerable and prone to anxiety in the face of work pressure.<sup>29 30</sup> However, male healthcare workers, as the main staff of the work, tend to undertake more heavy tasks. When they have bad emotions, they often cannot get the attention of the people around them in time, and the negative emotions are difficult to solve effectively, which leading to an increase in anxiety.<sup>31</sup> The results also show that healthcare workers aged 31–40 are more likely to have anxiety than those under 30. This finding might be explained by the fact that healthcare workers between the ages of 31–40 are in an ascending period of professional development and bear family responsibilities at the same time.<sup>32 33</sup> The dual pressures of occupation and family might cause great distress to them, and long-term accumulation of stress can lead to the development of anxiety.

### Chinese county-level hospital healthcare workers experience a high incidence of violence

With the continuous advancement of China's medical insurance reform and the hierarchical diagnosis and treatment system, the number of both outpatients and inpatients in county-level hospitals in China has increased, contributing significantly to China's health service system. However, the frequent occurrence of workplace violence in county-level hospitals has had a serious negative impact on the physical and mental health of healthcare workers as well as on appropriate diagnosis, treatment and care of patients. This has hindered the effective development of relevant functions at county-level hospitals in China. The study found that 67.28% of healthcare workers in county hospitals experienced workplace violence, which was higher than the rate of workplace violence in China's tertiary and township hospitals, and of healthcare workers in other countries.<sup>34–39</sup>

An analysis of the reasons for this high figure includes the following: China's medical insurance reform and the rapid promotion of the hierarchical treatment system have led to a significant increase in the number

**Table 1** The SAS score in our participants divided by demographic characteristics (N=1030)

Characteristics	N (%)	SAS score	T/F	P value
<b>Gender</b>				
Male	224 (21.75)	47.16±13.45	3.810	<0.001
Female	806 (78.25)	43.52±12.40		
<b>Age</b>				
<30	465 (45.15)	42.12±11.13	6.557	<0.001
31–40	315 (30.58)	46.16±13.16		
41–50	190 (18.45)	46.09±14.39		
51–60	57 (5.53)	46.23±13.97		
>60	3 (0.29)	40.82±13.93		
<b>Education level</b>				
<Bachelor	370 (35.92)	43.52±13.10	2.139	0.118
Bachelor	594 (57.67)	44.99±12.56		
≥Master	66 (6.41)	42.65±11.76		
<b>Marital status</b>				
Married	715 (69.42)	44.91±12.88	4.195	0.015
Single	302 (29.32)	42.69±11.96		
Other	13 (1.26)	49.13±17.41		
<b>Professional title</b>				
Senior	236 (22.91)	42.78±11.49	7.314	0.001
Intermediate	332 (32.23)	44.90±12.73		
Primary	462 (44.85)	46.50±14.53		
<b>Profession</b>				
Physician	404 (39.22)	45.08±12.14	6.035	0.014
Nurse	626 (60.78)	43.53±12.41		
<b>Department</b>				
Emergency	91 (8.83)	46.46±12.79	6.698	0.001
Outpatient	78 (7.57)	48.56±16.84		
Ward	861 (83.59)	43.70±12.19		
<b>Work experience (years)</b>				
<1	85 (8.25)	40.66±12.27	4.753	0.001
1–4	264 (25.63)	42.89±11.19		
5–10	282 (27.38)	44.15±11.89		
11–20	214 (20.78)	46.30±13.46		
>20	185 (17.96)	45.98±14.68		
<b>Daily working hours</b>				
<2	43 (4.17)	43.52±11.40	1.952	0.100
2–4	48 (4.66)	46.77±15.61		
5–6	52 (5.05)	41.49±10.40		
7–8	322 (31.26)	43.37±12.89		
>8	565 (54.85)	44.96±12.60		

SAS, Self-rating Anxiety Scale.

of patients going to county-level hospitals. Although they account for only 20% of the medical resources, they provide medical services for more than 70% of the population in the region.<sup>40</sup> Cai *et al*<sup>4</sup> found that the frequency

of hospital violence is significantly positively related to the number of visits to medical institutions. This situation also causes a short communication time between a single patient, and the effectiveness of communication between

**Table 2** Analysis of the factors that influence healthcare workers' anxiety

Characteristics	B	SE	t	95% CI	P value
Constant	37.64	2.58	14.57	32.57 to 42.70	<0.001
Gender					
Male	1.00				
Female	-2.72	0.94	-2.88	-4.57 to 0.87	0.004
Age					
<30	1.00				
31-40	2.83	1.06	2.66	0.75 to 4.92	0.008
41-50	2.07	1.49	1.39	-0.85 to 4.99	0.165
51-60	1.64	2.06	0.80	-2.40 to 5.68	0.427
>60					
Marital status					
Married	1.00				
Single	0.75	0.92	0.81	-1.06 to 2.55	0.42
Other	3.74	2.81	1.33	-1.77 to 9.25	0.18
Professional title					
Senior	1.00				
Intermediate	-0.84	0.95	-0.89	-2.69 to 1.02	0.38
Primary	-0.93	1.18	-0.79	-3.24 to 1.39	0.43
Profession					
Physician	1.00				
Nurse	0.90	0.84	1.08	-0.74 to 2.55	0.28
Department					
Emergency	1.00				
Outpatient	1.97	1.57	1.25	-1.11 to 5.06	0.21
Ward	-1.92	-1.11	-1.72	-4.10 to 0.27	0.09
Work experience (years)					
<1	1.00				
1-4	1.88	1.27	1.48	-0.62 to 4.38	0.14
5-10	1.68	1.42	1.18	-1.12 to 4.47	0.24
11-20	2.06	1.69	1.22	-1.27 to 5.38	0.23
>20	2.11	1.89	1.12	-1.61 to 5.83	0.27

healthcare workers and patients cannot be guaranteed.<sup>41</sup> In addition, the quality of the environment and the level of medical technology at the average county-level hospital in China are significantly lower than those of municipal hospitals, resulting in a relatively high rate of hospital violence. Furthermore, because county-level hospitals have low salary levels and relatively poor welfare benefits,

it is difficult to recruit new personnel, resulting in a shortage of human resources, which leads to increased work intensity for individual healthcare workers, and a possible decline in the quality of medical services. Even if new healthcare workers are found, their educational level is generally low, and the quality of staff is difficult to guarantee. Regarding the patients, those who visit

**Table 3** Type of violence experienced by healthcare workers (N=1030)

Type of violence	N	Per cent (%)
Verbal violence	681	66.12
Physical violence	157	15.24
Sexual harassment	47	4.56
Total	693	67.28

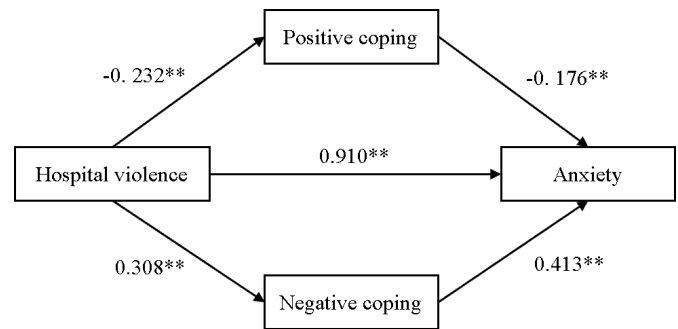
**Table 4** Healthcare workers who suffer from hospital violence and anxiety (N=1030)

Variables	No anxiety		Anxiety		Total
	N	Per cent (%)	N	Per cent (%)	
No violence	259	36.02	78	25.08	337
Violence	460	63.98	233	74.92	693
Total	719	100.00	311	100.00	1030

county-level hospitals are mainly from rural areas, and their education level is generally low, possibly resulting in frequent hospital violence. Additionally, due to the inherent uncertainty of healthcare, doctor-patient trust is very fragile, and patients are often the target of fraud, extortion and abuse of power.<sup>42</sup> According to a survey, 66.8% of patients in China distrust healthcare workers<sup>43</sup> and distrust between doctors and patients increases the risk of hospital violence.

Due to the differences in cultural background or special place intervention measures in different countries, the incidence of hospital violence in China is different from that in other countries.<sup>44 45</sup> China has a large population. The number of healthcare workers per 1000 population and the government’s medical expenditure is low, which leads to the heavy workload of doctors and nurses, damages the quality of communication with patients and leads to the occurrence of hospital violence.<sup>46 47</sup> In addition, some studies have shown that in Chinese medical institutions, the waiting time of patients is usually longer than that in other European countries, resulting in shorter communication time between healthcare workers and patients, which is more likely to lead to hospital violence. Moreover, when conflicts arise between doctors and patients, for some patients and their families, resorting to violence—especially towards healthcare workers—seems to be the only way to express dissatisfaction with the medical system.<sup>48</sup>

The Chinese government are advised to consider the actual circumstances of county-level hospitals by continuing to implement a policy of graded diagnosis and treatment; increasing support; ensuring the supply of human resources and providing more opportunities for further study and learning for medical personnel. At the same time, healthcare workers should strive to improve



**Figure 1** Parallel mediation of trait coping styles between hospital violence and anxiety Note: \*\*p<0.01, \*\*\*p<0.001.

their learning by updating knowledge and improving their technical levels. Strengthening communication and improving the level of trust between staff and patients could improve the moral quality. Staff should try to avoid the occurrence of hospital violence, to maintain their own safety. The legal and moral aspects should be addressed by increasing the punishment for violent medical acts and strengthening the education of the general public, thereby improving the basic moral quality and standards of the people. These measures would help to reduce the risk of hospital violence, promote harmonious doctor-patient relations and establish a safe and orderly diagnosis and treatment order.

**How hospital violence affects healthcare workers’ anxiety**

According to the US National Institute of Mental Health, one of the risk factors for anxiety is exposure to stressful and negative living conditions.<sup>5 49</sup> In addition, research showed that the economic, legal and social pressures that may be caused by offensive violence increase the risk of a series of mental symptoms, including anxiety.<sup>50</sup> As a concrete manifestation of violence, hospital violence may have a certain degree of negative impact on the physical and mental health of individuals. The results of this study show that hospital violence has a significant impact on the anxiety of healthcare workers, and there is a positive correlation between hospital violence and healthcare worker anxiety. The more frequently they experience hospital violence, the greater the anxiety of healthcare workers. This also confirms the research results of other scholars.<sup>26 51</sup> Anxiety, as a mental illness, has a negative impact on people’s physical and mental health, work and life. Because of the particularity of the work of medical

**Table 5** Means, SD, scale range and Pearson’s correlation coefficients (N=1030)

Variables	M	SD	Hospital violence	Positive coping	Negative coping	Anxiety
Hospital violence	2.765	3.189	–			
Positive coping	31.543	7.754	–0.091*	–		
Negative coping	26.626	7.581	0.114*	0.177†	–	
Anxiety	44.313	12.719	0.298†	–0.085*	0.254†	–

\*P<0.01.  
†P<0.001.

**Table 6** The mediating effect of trait coping styles in the relationship between hospital violence and anxiety (N=1030)

Variables	Effect	SE	95% CI	Percentage mediated (%)
Direct effect	0.9098	0.1216	0.000 to 0.671	84.42
Total indirect effect	0.1680	0.0343	0.108 to 0.245	15.59
Positive coping	0.0407	0.0172	0.012 to 0.079	3.78
Negative coping	0.1272	0.0349	0.066 to 0.205	11.80
P-N	-0.0865	0.0431	-0.177 to -0.006	

Note: P-N means positive coping-negative coping; when the 95% CI does not contain 0, the mediation effect between the two mediation paths is different.

staff, mental health problems may increase their own job risk, leading to the occurrence of adverse clinical events. Effective avoidance of this situation is important to improve the quality of hospital services and protect patient safety. Hospital managers should pay attention to healthcare workers who are victims of hospital violence, guide them psychologically in a timely manner and avoid the development or further deterioration of anxiety. Healthcare workers should also adjust their mentality in a timely manner, with appropriate support, and take measures to reduce the adverse effects of anxiety on their work and life.

#### Trait coping styles play a mediating role between hospital violence and anxiety

This study found that the two dimensions of trait coping styles (positive coping and negative coping) play a role in mediating the relationship between hospital violence and the anxiety of healthcare workers. Hospital violence has an indirect effect on healthcare workers' anxiety through positive coping and negative coping. Hospital violence is negatively related to positive coping and positively related to negative coping. It is evident that the greater the severity of the hospital violence experienced, the less likely health workers are to respond positively and the more likely they are to respond negatively. This is consistent with previous research.<sup>52 53</sup> Various forms of hospital violence have caused serious damage to the mental health of healthcare workers, which may cause a decrease in work enthusiasm, lower work engagement and even result in job burnout and turnover intention.<sup>54</sup> This is more likely to result in passive rather than positive ways to deal with the negative impact of hospital violence and increases the damage to their physical and mental health. The results of this study also show that after being subjected to violence in the hospital, adopting positive coping styles is beneficial to reducing anxiety, while adopting negative coping styles has the opposite effect. This is consistent with previous research.<sup>13 55</sup> Healthcare workers who respond positively are more likely to proactively resolve negative emotions caused by hospital violence and return to normal life and work more quickly. These responses include talking to colleagues, subconsciously correcting their negative emotions and behaviours and trying to maintain communication with patients or their families.

However, healthcare workers who adopt negative coping styles are more likely to adopt an adverse attitude when dealing with the harmful effects of hospital violence, and they are likely to form a vicious circle of negative emotion feeding on further negative emotion that can aggravate their anxiety.

A particular finding in this study is that in this parallel mediation path, there is a significant difference between the mediation effects of positive and negative coping (95% CI -0.177 to -0.006). Negative coping plays a stronger mediating role between hospital violence and anxiety. As a negative incident is experienced by the healthcare worker, it also affects the physical and mental health of other healthcare workers. The more violence experienced in hospitals, the more healthcare workers will lose confidence in their work and life.<sup>56 57</sup> This tends to result in the adoption of a negative approach to dealing with the adverse effects caused by the event, thereby generating or aggravating anxiety. Positive coping, as a strategy that can correct the negative emotions of healthcare workers, does not play a significant role in the actual situation. Therefore, the question of how to help healthcare workers to adopt a more positive coping strategy after the experience of hospital violence is one that hospital administrators and healthcare workers themselves should focus on. In previous studies, it was found that targeted training had a significant effect on empowering hospital employees and changing their attitudes towards hospital violence.<sup>58</sup> Hospitals should provide psychological counselling and training opportunities to respond to negative emotions for healthcare workers who are victims of hospital violence so that they can learn skills and methods to respond more positively and deal with the adverse effects after they have been subjected to hospital violence. In addition, an organisation team of healthcare workers should also provide psychological and social support to healthcare workers to help them processing negative emotions and protect their mental health. At the same time, healthcare workers should maintain a good attitude, try to correct their negative behaviours, use a more positive way to alleviate or avoid the generation of anxiety and return to their normal work routine and life as soon as possible. The anxiety of medical staff can be fundamentally reduced only by adopting more effective



prevention and control measures to avoid the occurrence of violence in the hospital workplace. Therefore, the effective prevention and control of violence in hospital workplaces is a key research direction in the future.

### Limitations

This study investigated the incidence of violence and anxiety of healthcare workers in 30 county-level hospitals in China and discussed the relationship between hospital violence, trait coping style and anxiety. The aim was to provide a reference for the government to understand the current situation that healthcare workers face and suggest an intervention pathway to reduce their anxiety. However, this study has several limitations. First, the sample size is relatively small; therefore, the scope of the survey needs to be expanded to more accurately understand the real state of hospital violence and anxiety of Chinese healthcare workers. Second, this study is a cross-sectional study, and it is difficult to determine the causal relationship between the variables. Third, the assessment is based on the self-report of healthcare workers, and there may be recall bias.

### CONCLUSION

Overall, the results of this study show that the incidence of hospital violence among healthcare workers in county-level hospitals in China is relatively high, and there is a correlation between hospital violence, coping styles and anxiety. Positive and negative coping play a mediating role in the impact of hospital violence on the anxiety of healthcare workers. Moreover, compared with positive coping, negative coping has a stronger mediating role. Therefore, the government should pay special attention to prevention measures, improvement of the training and support of healthcare workers and education of the public, to reduce the incidence of hospital violence. Hospital administrators should also focus on this issue and provide corresponding support and assistance to healthcare workers. Healthcare workers should maintain a good attitude, try to correct their negative behaviours and develop positive coping skills to relieve or avoid their anxiety.

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