

ORIGINAL ARTICLE

Prevalence, characteristics, and consequences of verbal and physical violence against healthcare staff in Chinese hospitals during 2010–2020

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Abstract

Objectives: This study investigated the characteristics of workplace violence (WPV) against Chinese healthcare staff and their casualties after severe physical violence (PV).

Methods: We scrutinized medical WPV incidents reported online and analyzed information on timing, location, violence, criminal incentives, and casualties following severe PV in China from 2010 to 2020.

Results: WPVs were mostly committed by young and middle-aged male family members of the patients, especially in the emergency department (49.1%), and mostly associated with dissatisfaction with treatment effect (28.9%) in general. High medical costs (62.5%) were the leading cause of verbal violence (VV), whereas men predominantly committed PV (OR = 4.217, 95% CI: 1.439–12.359) owing to dissatisfaction with the healthcare staff's attitude ($P < 0.001$). The victims were security personnel in most cases (81.1%). Nurses were generally more likely to experience PV ($P < 0.05$), while doctors were more likely to experience lethal PV (OR = 4.732, 95% CI: 1.42–15.772), which mostly happened in oncology ($P < 0.05$) and committed by visitors ($P < 0.001$). Slight injuries and mortality were more likely to be inflicted by being rejected for unreasonable demands and disappointed with the treatment effect ($P < 0.05$).

Conclusions: Medical WPV has numerous reasons, locations, and diverse victims and offenders. Some severe WPVs have serious consequences. Therefore, it is recommended for the concerned authorities to adopt effective steps for appropriate legislative, security, and conflict-resolution measures.

KEYWORDS

casualties, China, healthcare staff, online search, workplace violence

Chen Jia and Yijing Han contributed equally to this work.

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1 | INTRODUCTION

Workplace violence (WPV) is defined as socially undesirable, aggressive (and occasionally harmful) conduct by an individual or a group in the workplace.¹ It is categorized into physical and nonphysical violence. Nonphysical violence is mostly verbal violence (VV), which mainly refers to any threatening statement or complaint that does not cause physical injury and may result in psychological suffering such as depression, anxiety, and decreased productivity.² Physical violence (PV) is defined as physical force or an item to assault another person, resulting in physical injury, dysfunction, permanent disability, or even death that is, severe WPV.³

WPV against healthcare workers is a global public health issue that has raised concerns, jeopardized their job happiness and health, and even compromised the medical service environment.^{4,5} In 2019, World Health Organization (WHO) estimated that 8%–38% of healthcare staff suffered from violence while working.⁶ Several studies have investigated WPV worldwide, but fluctuating outcomes came up due to different medical systems and national conditions.^{7–9}

On the other hand, few studies have reported the effect of severe WPV on healthcare workers. However, less common than milder forms of violence, severe WPV against healthcare workers may attract more attention from the media and the general public once it has been reported since it reflects the worst relationship between healthcare workers and patients and particularly unfavorable living conditions for medical personnel in certain medical systems.¹⁰ Nevertheless, discussing it again may create psychological or spiritual trauma for the victims or their families, making it difficult to research the subject using standard techniques such as surveys and interviews. Previously, a study used data from online internet sources to explore severe WPV in China from 2004 to 2018 and revealed the characteristics, prevalence, and causes of severe WPV in China. Thus these studies imply that mass media reports may be the best way to study severe WPV at present, which inspired our research methodology.¹⁰

Therefore, our study aimed to present the prevalence and features of both VV and PV against healthcare staff and the consequences of severe WPV arising from PV in China from 2010 through 2020 based on online reports.

2 | MATERIALS AND METHODS

2.1 | Sample and data collection

The Baidu News, an internet search engine, was used to conduct a retrospective scan from January 2010 to May

2020. Baidu News is China's largest and most up-to-date online search engine; it suggests about 5–6 reports relevant to the typed keywords from over 500 websites.¹¹ “Da Yi Sheng” (beating doctors), “Da Hu Shi” (beating nurses), and “Bao Li Shang Yi” (healthcare staff's casualties by WPV) were used as search keywords for finding news and reports online in Chinese Mainland, Hong Kong, Macao, and Taiwan. The first search results round were then used as seed events for the following round. The process was repeated until no more incidents of violence against healthcare workers were found. Baidu News does not support precise search and can generate duplicated and irrelevant reports. Thus, we manually reviewed 367 report titles and extracted additional information if needed to ensure the validity of the data. Finally, 37 duplicated and 30 irrelevant reports were excluded based on the following criteria: (i) The report titles were different, but the contents were duplicated or false, and (ii) The reports contained the search keywords but did not involve medical WPV. Finally, there were 300 reports involving VV and PV against healthcare workers for the final dataset.

2.2 | Measurement

The demographic information of victims was collected, including profession, gender, and working department. While for the perpetrators, gender, identity, age group, and criminal incentives were acquired. In addition, casualties after severe WPV, including slight injury, severe injury, and death, were also collected, all of which were defined according to the “Human Body Injury Degree Identification Standard” jointly issued by the Supreme People's Court of Mainland China, the Supreme People's Procuratorate, the Ministry of Public Security, the Ministry of Security, and the Ministry of Justice.

2.3 | Statistical analyses

The IBM SPSS 25 version was used to analyze the data (IBM Corp.). Descriptive statistics were presented as percentages (%). The Chi-squared test was applied to evaluate differences in categorical variables. Multivariable logistic regression analysis was used to determine whether profession, gender, and working department for healthcare staff and age group, identity, gender, and criminal incentives for perpetrators were associated with VV and PV. Similarly, factors related to PV exposure were included in a multiple logistic regression analysis to investigate the correlation between casualties and severe WPV.

2.4 | Patient and public involvement

The samples and information used in this research were collected from the Internet search, and no individuals were involved.

3 | RESULTS

Most of the samples collected in this study came from general tertiary hospitals ($n = 238$, 79.3%).

3.1 | Geography and time distribution

In this study, the geographical distribution of WPV against healthcare staff is shown in Figure S1, which revealed that coastal areas of China had the highest incidence of medical WPV in the past 10 years (2010–2020). In terms of the time distribution, the highest incidences of WPV were in 2014 ($n = 54$, 18.0%) and 2016 ($n = 58$, 19.3%), with the number of WPV reported by the media declining after 2016 (Figure 1). Moreover, these WPVs were relatively concentrated in March ($n = 30$, 10.0%) and May ($n = 30$, 10.0%), as shown in Figure 2.

3.2 | Exposure to WPV

Table 1 shows the descriptive relationship between the subject's characteristics and exposure to VV or PV. The results indicated that security personnel (6.5%) were more exposed to VV than doctors and nurses, while nurses experienced most PV (100%, $P = 0.025$). Furthermore, the highest risk of VV was in the neonate (14.3%), followed by surgery (9.5%) and emergency department (7.5%), whereas the highest incidence of PV was reported in otolaryngology and oncology departments (100%).

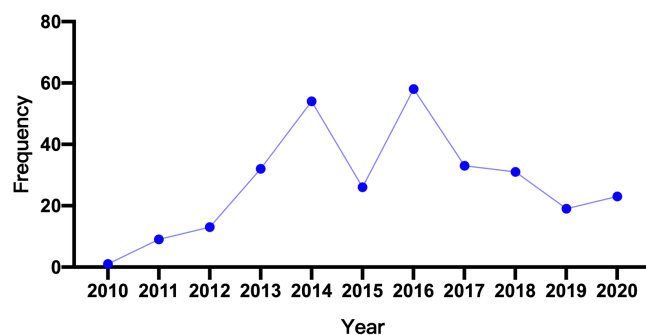


FIGURE 1 The year and frequency distribution of medical WPV in this study

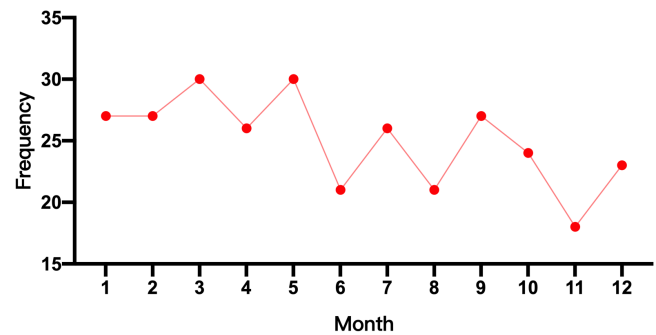


FIGURE 2 The month and frequency distribution of medical WPV in this study

Characteristics of perpetrators are also significant. In this research, mixed-gender (including men and women) perpetrators caused more VV to healthcare workers, whereas female perpetrators caused more PV than males ($P = 0.009$). WPV was mostly committed by young (38.0%) and middle-aged (47.4%). Both VV and PV were primarily committed by family members of patients, followed by patients, though without statistical significance ($P = 0.165$). WPV was often triggered by dissatisfaction with the treatment effect (28.9%) and long waiting time (27.4%). Specifically, VV was mostly committed by expensive medical costs (62.5%, $P = 0.025$), whereas PV was mainly attributed to the discontent with the treatment effect (93.6%), followed by the long waiting time for treatment (18.3%, $P < 0.001$).

3.3 | Factors associated with WPV

Table 2 shows the results of a multivariable logistic regression analysis conducted to determine the variables associated with suffering medical WPV. Male perpetrators were found to be 4.217 times more likely than mixed-gender perpetrators to commit PV against health professionals (95%CI:1.439–12.359). In addition, an increased likelihood of VV was predicted when medical expenses were too high.

3.4 | Exposure to casualty

Table 3 shows the descriptive relationship between the dynamic characteristics and exposure to a slight injury, serious injury, or mortality after severe PV. According to the present research, doctors (15.2%, $P = 0.009$) were shown to have higher fatal PV than nurses and security personnel. Oncology department had the highest risk of lethal PV (25.0%), followed by surgery (13.6%, $P = 0.031$). After committing serious PV, perpetrators over 51 years of age inflicted the most serious injuries to victims (12.5%,

TABLE 1 Characteristics of variables exposure to verbal and physical violence

	Verbal violence		Physical violence		P-Value
	n	%	n	%	
Profession					0.025*
Doctor	1	1.5	64	98.5	
Nurse	0	0	83	100	
Security personnel	7	6.5	101	93.5	
Gender (victims)					1
Male	1	0.9	106	99.1	
Female	2	1.8	110	98.2	
Department					0.721
Surgery	2	9.5	19	90.5	
Internal medicine	1	3	32	97.0	
Oncology	0	0	4	100	
Emergency	8	7.5	99	92.5	
Neonate	4	14.3	24	85.7	
Medical imaging	1	7.1	13	92.9	
Otolaryngology	0	0	10	100	
The age group of the perpetrators (years)					0.696
≤30	4	7.7	48	92.3	
31–50	2	3.1	63	96.9	
≥51	0	0	11	100	
Mixed	0	0	9	100	
Gender (perpetrators)					0.009*
Male	11	5.2	201	94.8	
Female	0	0	31	100	
Mixed	6	18.8	26	81.3	
Identity of perpetrators					0.165
Patient	3	5.3	72	94.7	
Family members	12	7.1	158	92.9	
Visitors	1	18.8	13	81.2	
Top incentives for violence					<0.001*
Long waiting time for treatment	4	5.5	69	94.5	
Not satisfied with the service attitude of healthcare staff	0	0	21	100.0	
Not satisfied with the treatment effect	4	6.4	73	93.6	
Medical expenses are expensive	10	62.5	6	37.5	
Unreasonable demands are rejected	0	8.1	34	91.9	
Drinking and drug abuse	4	8.9	41	91.1	

*indicates a significant value ($P < 0.05$).

$P = 0.007$). This research found that visitors were the ones that inflicted the most serious injuries (12.5%, $P = 0.007$) and fatalities (25.0%, $P < 0.001$) on victims. Slight injuries after severe PV of victims were mainly attributed to

those rejected with unreasonable demands of perpetrators (29.7%, $P = 0.024$), whereas the mortalities of victims were mostly due to their dissatisfaction with the treatment effect (14.1%, $P = 0.047$).

TABLE 2 Multivariable logistic regression of WPV

		OR	95% CI	P-Value
Profession ^a	Doctor vs. Security personnel	4.436	0.533–36.901	0.168
	Nurse vs. Security personnel	n.a.		
Gender (victims) ^a	Male vs. Female	1.927	0.172–21.571	0.594
Department ^a	Surgery vs. Otolaryngology	1.421	0.129–15.635	0.774
	Internal medicine vs. Otolaryngology	0.900	0.083–9.750	0.931
	Oncology vs. Otolaryngology	3.000	0.14–64.262	0.482
	Emergency vs. Otolaryngology	0.17	0.014–2.059	0.164
	Neonate vs. Otolaryngology	0.321	0.018–5.679	0.439
	Medical Imaging vs. Otolaryngology	n.a.		
The age group of the perpetrators (years) ^b	≤30 vs. Mixed	n.a.		
	31–50 vs. Mixed	n.a.		
	≥51 vs. Mixed	n.a.		
Gender (perpetrators) ^b	Male vs. Mixed	4.217	1.439–12.359	0.009*
	Female vs. Mixed	n.a.		
Identity of perpetrators ^b	Patient vs. Visitors	1.846	0.178–19.146	0.607
	Family members vs. Visitors	1.013	0.122–8.412	0.991
Top incentives for violence ^b	Long waiting time for treatment vs. Drinking and drug abuse	1.683	0.399–7.094	0.478
	Not satisfied with the service attitude of healthcare staff vs. Drinking and drug abuse	n.a.		
	Not satisfied with the treatment effect vs. Drinking and drug abuse	1.78	0.423–7.498	0.432
	Medical expenses are expensive vs. Drinking and drug abuse	0.059	0.014–0.247	<0.001*
	Unreasonable demands are rejected vs. Drinking and drug abuse	n.a.		

Note: Physical violence is the outcome variable of these multiple logistic studies.

Abbreviations: CI, Confidence interval; n.a., not applicable; OR, Odds ratios.

^aAdjusted for the profession, gender, and working department of victims.

^bAdjusted for the age group, gender, identity, and incentive of perpetrators.

*Significant value ($P < 0.05$).

3.5 | Factors associated with casualty

The multivariable logistic regression analysis results for factors associated with casualties of healthcare staff following serious PV are presented in Table 4. Visitors were more likely than family members of patients to cause serious damage and mortality to the victims. Doctors were 4.732 times more likely to receive death due to severe PV than security personnel (95% CI:1.42–15.772).

4 | DISCUSSION

This study aimed to reveal the features of WPV reported online against healthcare staff in China. Our findings revealed information on the victims and perpetrators of

WPV in Chinese hospitals, the geographical and temporal distribution of the violence, the kind of violence, and the casualty outcomes. It should be noted that PV was the most common kind of WPV in this research, followed by VV, which was probably associated with inputting terms on the Internet.

4.1 | Geography and time distribution of WPV

We found that the eastern coastal region had the highest incidence of medical WPV in the past 10 years. Similar studies in China have shown comparable findings, with the highest prevalence seen in Guangdong, Jiangsu, and Zhejiang.^{6,10} The National Bureau of Statistics of China

TABLE 3 Characteristics of variables exposure to a slight injury, severe injury, and mortality

	Slight injury			Severe injury			Mortality		
	<i>n</i>	%	<i>P</i> -Value	<i>n</i>	%	<i>P</i> -Value	<i>n</i>	%	<i>P</i> -Value
Profession			0.302			0.942			0.009*
Doctor	7	10.6		4	6.1		10	15.2	
Nurse	12	14.3		4	4.8		4	4.8	
Security personnel	21	19.1		6	5.5		4	3.6	
Gender (victims)			0.280			0.338			0.713
Male	21	19.4		8	7.4		9	8.3	
Female	16	14.0		5	4.4		8	7.0	
Department			0.289			0.110			0.031*
Surgery	2	9.1		2	9.1		3	13.6	
Internal medicine	4	12.1		2	6.1		3	9.1	
Oncology	2	50.0		1	25.0		1	25.0	
Emergency	14	13.0		2	1.9		2	1.9	
Neonate	5	17.2		1	3.4		1	3.4	
Medical imaging	4	28.6		1	7.1		0	0	
Otolaryngology	1	10.0		0	0		1	10.0	
The age group of the perpetrators (years)			0.795			0.007			0.902
≤30	7	13.0		7	9.2		6	11.1	
31–50	9	13.8		3	1.8		8	12.3	
≥51	2	18.2		2	12.5		1	9.1	
Mixed	2	22.2		3	7.9		0	0	
Gender (perpetrators)			0.436			0.461			0.540
Male	32	15.0		13	6.1		17	7.9	
Female	3	9.4		0	0		1	3.1	
Mixed	7	21.2		1	3.0		1	3.0	
Identity for perpetrators			0.481			0.007			<0.001*
Patient	8	10.5		7	9.2		11	14.5	
Family members	27	15.9		3	1.8		5	2.9	
Visitors	3	18.8		2	12.5		4	25.0	
Top incentives for violence			0.024			0.307			0.047*
Long waiting time for treatment	13	17.8		3	4.1		2	2.7	
Not satisfied with the service attitude of healthcare staff	4	19.0		0	0		0	0	
Not satisfied with the treatment effect	6	7.7		4	5.1		11	14.1	
Medical expenses are expensive	0	0		2	12.5		1	6.3	
Unreasonable demands are rejected	11	29.7		0	0		3	8.1	
Drinking and drug abuse	7	15.6		1	2.2		1	2.2	

*Significant value ($P < 0.05$) (in bold).

TABLE 4 Multivariable logistic regression of a slight, severe injury, and mortality

	Slight injury			Severe injury			Mortality		
	OR	95% CI	P-Value	OR	95% CI	P-Value	OR	95% CI	P-Value
Profession^a									
Doctor vs. Security personnel	0.503	0.201–1.257	0.141	1.118	0.304–4.118	0.867	4.732	1.42–15.772	0.011*
Nurse vs. Security personnel	0.706	0.326–1.532	0.379	0.867	0.237–3.175	0.829	1.325	0.322–5.46	0.697
Gender (victims)^a									
Male vs. Female	1.478	0.726–3.012	0.282	1.744	0.552–5.507	0.343	1.205	0.447–3.245	0.713
Department^a									
Surgery vs. Otolaryngology	0.9	0.072–11.254	0.935	n.a.			1.421	0.129–15.635	0.774
Internal medicine vs. Otolaryngology	0.931	0.086–10.095	0.953	n.a.			0.9	0.083–9.75	0.931
Oncology vs. Otolaryngology	9.000	0.522–155.242	0.13	n.a.			3.000	0.14–64.262	0.482
Emergency vs. Otolaryngology	1.34	0.158–11.403	0.789	n.a.			0.17	0.014–2.059	0.164
Neonate vs. Otolaryngology	1.875	0.192–18.324	0.589	n.a.			0.321	0.018–5.679	0.439
Medical Imaging vs. Otolaryngology	3.6	0.337–38.477	0.289	n.a.			n.a.		
Age group of the perpetrators (years)^b									
≤30 vs. Mixed	0.521	0.09–3.032	0.468	0.308	0.025–3.798	0.358	n.a.		
31–50 vs. Mixed	0.563	0.101–3.147	0.513	0.667	0.069–6.454	0.726	n.a.		
≥51 vs. Mixed	0.778	0.087–6.983	0.822	0.8	0.043–14.886	0.881	n.a.		
Gender (perpetrators)^b									
Male vs. Mixed	0.653	0.261–1.631	0.362	2.07	0.262–16.367	0.491	2.761	0.355–21.474	0.332
Female vs. Mixed	0.384	0.09–1.642	0.197	n.a.			1.032	0.062–17.24	0.982
Identity of perpetrators^b									
Patient vs. Visitors	0.51	0.119–2.181	0.364	0.71	0.133–3.784	0.688	0.508	0.138–1.862	0.307
Family members vs. Visitors	0.818	0.218–3.066	0.766	0.126	0.019–0.816	0.03	0.091	0.022–0.383	<0.001*
Top incentives for violence^b									
Long waiting time for treatment vs. Drinking and drug abuse	1.176	0.431–3.212	0.752	1.886	0.19–18.703	0.588	1.239	0.109–14.075	0.863
Not satisfied with the service attitude of healthcare staff vs. Drinking and drug abuse	1.277	0.329–4.952	0.723	n.a.			n.a.		

(Continues)

TABLE 4 (Continued)

	Slight injury		Severe injury		Mortality	
	OR	95% CI	P-Value	OR	95% CI	P-Value
Not satisfied with the treatment effect vs. Drinking and drug abuse	0.452	0.142–1.442	0.18	2.378	0.258–21.961	0.445
Medical expenses are expensive vs. Drinking and drug abuse	n.a.			6.286	0.529–74.659	0.145
Unreasonable demands are rejected vs. Drinking and drug abuse	2.297	0.787–6.702	0.128	n.a.		

Abbreviations: CI, Confidence interval; n.a., not applicable; OR, Odds ratios.

^aAdjusted for the profession, gender, and working department of victims.

^bAdjusted for the age group, gender, identity, and incentive of perpetrators.

*Significant value ($P < 0.05$) (in bold).

(<http://data.stats.gov.cn/search.htm>) reported that the above provinces had high gross domestic products (GDPs) and large populations. Thus, besides the likely selection bias, we speculate that economically developed provinces attract millions of migrant workers every year—and thus adding to the already overloaded burden of the health-care staff by residents—has led to a higher frequency of medical WPV. WPV rate increased dramatically in 2014 and then dropped after 2016, which might be due to the adoption in China of a series of laws on the punishment of unlawful crimes involving medical services to preserve the regular order of health settings since 2014.⁶ For instance, the “Views on Punishing Medical-related Illegal Crimes and Maintaining Normal Medical Order” jointly promulgated by the Supreme People’s Court, the Supreme People’s Procuratorate, the Ministry of Public Security, the Ministry of Justice, and the National Health and Family Planning Commission in 2014 states that criminals who had intentionally injured healthcare staff or destroyed public or private property without causing serious consequences should be punished under the “Law on Administrative Punishments for Public Security of the People’s Republic of China”. However, those who had intentionally severely injured or killed healthcare staff and other serious consequences should be convicted and punished under the relevant provisions of the “Criminal Law of the People’s Republic of China”.

4.2 | Features of WPV

This study found that security personnel suffered most WPV (42.4%), followed by nurses (32.4%) and doctors (25.4%), which chiefly aligns with previous literature,^{12,13} suggesting that nurses are more likely to be the victims of WPV than doctors. In this study, security personnel accounted for the largest proportion of victims of WPV, which is at odds with previous sporadic reports where security personnel was being attacked. On the one hand, it may be related to the fact that most previous research studies involved medical professionals rather than security personnel and were conducted through questionnaires. Similarly, security personnel is primarily responsible for verifying visitors’ identities and luggage and regulating their entrance to hospitals, which is more likely to cause animosity among visitors who are already under stress. Thus we shall pay more attention to security staff. Besides, doctors were more likely to be exposed to VV, while nurses were more likely to experience PV; other studies have reached similar findings.^{14,15} The frequency and type of violence did not differ by victims’ gender.

Medical WPV in this study has mostly occurred in the emergency department (49.3%), followed by internal

medicine (15.2%) and neonate (12.9%) departments. As described in previous studies, the emergency department had a high risk for WPV,¹⁶ and Chinese healthcare staff in children's hospitals experienced violence commonly.¹⁷ Because a major internal medicine department has many subordinate departments, WPV may be reported more often, but the neonatology department is more vulnerable to WPV outbreaks owing to the unique nature of patients and the specific concerns of their families. Similarly, the distribution of PV and VV departments did not vary considerably.

Young and middle-aged men mostly committed medical WPV, and the findings of this study are consistent with previous studies.^{18,19} The reason may be that young men are more impulsive and more likely to quarrel with healthcare staff. More specifically, this study showed that male perpetrators were more likely to use VV against healthcare staff, while females were more likely to use PV, which conforms with previous research studies suggesting that men committed physical violence more frequently than women and the reasons behind this need further investigation.²⁰ PV was also more likely to occur when perpetrators were solely men than mixed-gender perpetrators. This might be attributed to the reason that mass PV is less likely.

In addition, perpetrators were mainly the patients' family members (65.6%), followed by patients (29.0%), as described in previous literature.^{21,22} They may be under the same psychological stress as patients; also, they must deal with complex medical procedures, expenses, and other concerns, all of which might lead to more quarrels.

In terms of WPV incentives, we found dissatisfaction with the treatment effect (28.9%) was the most important factor, consistent with previous findings.²³ This may be caused by patients' or their families' high expectations regarding the effect of diagnosis and treatment. As reported in earlier studies, the long waiting time (27.4%) was another reason for medical WPV.^{24,25} On the other hand, dissatisfaction with the service attitude of healthcare staff was more likely to promote the occurrence of PV; and the high medical expenses were more likely to promote the occurrence of VV. Therefore, better communication between physicians and patients is required.

4.3 | Features of slight, severe injury, and mortality in WPV

In agreement with a previous study,²⁶ severe WPV resulting from severe PV may get greater attention from the media and the general public, although less prevalent than milder types of violence. Thus, we analyzed the casualties of healthcare staff following severe WPV. The doctors appeared to be more vulnerable to lethal PV, and our

logistic regression analysis also showed that doctors were 4.732 times more likely to suffer mortality in severe WPV than security personnel, as reported in previous studies.^{27,28} This may be because doctors bear the main medical responsibility. When patients or family members are dissatisfied with the treatment's outcome, they often vent their frustrations on the doctor. Severe WPV occurred among oncology (25.0%), surgery (13.6%), and otolaryngology (10.0%) departments were more likely to result in healthcare staff's mortality, which may be related to the characteristics of these departments that treat critically ill patients.

This study found that severe WPV committed by mixed-gender or mixed age groups often resulted in slight injuries to victims, although this difference was not statistically significant. In addition, visitors were more likely to inflict severe or lethal PV on healthcare staff. Such individuals visit hospitals not to consult a doctor but to seek out relevant healthcare personnel they may retaliate with.

Finally, the perpetrators often resorted to lethal PV against healthcare staff because they were dissatisfied with the medical treatment effect, and the injury caused by refusing unreasonable demands is relatively minor. Previous research has also shown that the most serious cases of WPV may be triggered by larger problems, such as those related to diagnosis and treatment, rather than by minor problems.⁶

Medical WPVs are frequent, complex, and seriously harmful to healthcare staff and the medical environment. To avoid WPV, hospitals must follow the safety management guidelines and educate healthcare personnel and implement WPV countermeasures.

4.4 | Limitation

The main limitation of this study was that it was based on online reports, whose integrity and authenticity were influenced by factors such as government regulations, areas where reports were made, the interests of public media and internet companies, the professional ethics of the journalists responsible for the reports, and the validity of the resources. In addition, the number of samples (300) in this study were limited, and the years were mainly concentrated from 2011 to the first half of 2020.

5 | CONCLUSION

Our study reflected a bleak healthcare environment in China, including dangerous working conditions for health professionals and strained doctor-patient interactions. Specifically, this study found that medical WPV

mostly occurred in emergency, internal medicine, and neonate departments, most often committed by young male family members of patients, and was often associated with dissatisfaction with medical treatment effects and the long waiting time for it. The two types of violence and the casualties after severe WPV may be related to the different characteristics of victims and perpetrators. We strongly believe that public education should be improved to increase mutual understanding between healthcare staff and patients. Additionally, improved medical resource allocation and increased legal action against medical WPV might lower the probability of such incidents.

AUTHOR CONTRIBUTIONS

W.P.L and Y.J.H conceived the ideas; W.Z.L. and J.N.J collected the data; R.F.L. analyzed the data; C.J. and Y.J.H. led the writing.

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CONFLICT OF INTEREST

The authors declared no conflict of interest.

DATA AVAILABILITY STATEMENT

No additional data are available.

DISCLOSURE

Approval of the research protocol: N/A. Informed Consent: N/A. Registry and the Registration No. of the study/trial: N/A. Animal Studies: N/A.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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