

BMJ Open Study on factors inducing workplace violence in Chinese hospitals based on the broken window theory: a cross-sectional study

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ABSTRACT

Objectives To explore the potential components of hospital workplace violence (HWPV) from the perspectives of hospital administrators and patients, and put forward corresponding strategies for its prevention and control.

Setting Using convenience sampling methods, 116 hospitals in 14 provinces of China were surveyed using a self-designed questionnaire.

Methods A cross-sectional study was used.

Participants Hospital administrators and patients from 116 hospitals in 14 provinces of China.

Results First, hospital administrators point of workplace factors included six factors, with the following weighting coefficients: hospital administrator factors (29.40%), patient-related factors (20.08%), hospital environmental factors (19.45%), policy and institutional factors (11.92%), social psychological factors (10.26%), objective events factors (8.89%). Second, patients from the hospital workplace predisposing factors included three common factors. The weight coefficients of these were hospital-related factors (60.27%), social and governmental factors (23.64%) and patient-related factors (16.09%).

Conclusions A wide range of factors according to hospital administrators, patients and in the hospital environment play important roles in HWPV. From the perspectives of hospital administrators, communication skills and attitude to the service are important factors for inducing HWPV. From the perspective of patients, the characteristics of staff personalities and medical cognition are more important inducing factors. As far as social factors are concerned, economic compensation of medical malpractice is an important inducing factor for HWPV. In terms of environmental factors, management of Chinese medical hospitals, medical procedures and the layout of departments are all potential factors for the occurrence of violence. Corresponding defects were exposed in the health legal system and the supervision system for influencing public opinion.

BACKGROUND

Hospital workplace violence

Hospital workplace violence (HWPV) is defined by WHO as the occurrence of staff members or health facilities that are

Strengths and limitations of this study

- The study sample came from 14 Chinese provinces, with a wide range of different representatives, which could produce a sound analysis of hospital workplace violence (HWPV)-induced factors.
- The study is valuable in proposing recommended changes to the workplace for the remission of violence in hospitals.
- The study is a prospective cross-sectional study, aimed at determining the factors inducing HWPV from occurrences during the past few years. Due to time and resource constraints, it involved collecting data prospectively, and so may suffer from recall bias.

abused, threatened or attacked in the workplace, leading to clear or implicit challenges to their safety, well-being and health. Categories of HWPV include insults, threats, assaults, physical harm, sexual assaults or sexual harassment, destruction of hospital or personal property and the interference with normal medical work.¹

HWPV status

Previous studies have shown that, in Switzerland, 72% of nurses have experienced verbal violence from patients or visitors, and 23% have suffered physical violence.² The National Health Service reported that 12% of their healthcare workers had experienced violence from patients or families in 2008³. In Rwanda, 39% of hospital administrators had been subjected to violence.⁴ HWPV has now been recognised as a particular phenomenon, therefore, it has received some attention and research relating to it has been gradually increasing. WHO believe that workplace violence in hospitals has become a serious threat to human health, and defined it as a global public health problem.⁵ In 2001, it was reported that in



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the USA 17% of nurses had been physically attacked in the past year, and more than half (57%) had been threatened or attacked verbally.⁶ Alexander and Fraser conducted a cross-sectional survey in eastern Australia, including full-time hospital administrators, physicians and nurses. Results showed that 68% of nurses, 47% of full-time healthcare providers and 48% of general practitioners were victims of violence from patients and/or their families.⁷ Hegney *et al* determined that HWPV in the nursing profession was associated with high work stress, teamwork and supportive work,⁸ while an Italian study showed that nurses and internship students were most likely to be the victims of verbal abuse.⁹ In many cases, HWPV has become a recognised fact. For example, Australia, the UK, Europe and the USA have adopted a zero tolerance policy and occupational health and safety regulations have been implemented in many countries.^{10 11}

'Broken window theory'

The 'broken window theory', also known as the 'broken window effect', is a social psychological effect. The political scientist Wilson and the criminologist Karen published an article in 1982 entitled *Broken window police and neighbourhood security*, in which they first proposed the concept of the 'broken window theory'.¹² The theory states that if a laissez-faire attitude to a harmful phenomenon in the environment is taken, people will follow it, or it will become intensified.¹³ The broken window theory suggests that human behaviour and environments are strongly suggestive and inducible, and the role of minutiae in dictating event outcomes cannot be ignored.^{14 15} It was suggested that the relevant agencies of law enforcement or other departments should act to improve the possible breeding of the external environment of crime through the timely cutting off of a particular environment in order to control the occurrence of criminal acts.¹⁶

The broken window theory in medical environments

The medical environment can be divided into two categories: the hardware environment and the social environment.^{9 17} Whether the medical environment or the hospital environment is a part of the social environment will be dependent on national policies, laws and regulations, social support and other factors. In hospital management, the broken window theory can be a guide for managers to discover the 'first broken window' in the hospital environment, and to adopt corresponding measures to repair it in time, and then provide a safe and orderly medical environment for the public. Based on this, we will determine the factors that may lead to the occurrence of HWPV. HWPV is a complex social phenomenon, from the perspective of the environment and taking into account the psychological characteristics of the perpetrators, their motivations and other factors. In the present study, the causes of HWPV were explored through field investigations and analysis, combined with the broken window

theory and a factor analysis method, in an effort to assist the government and health administrative departments to develop prevention and control measures for HWPV. The current work will accelerate China's medical and health systems towards further reform.

MATERIALS AND METHODS

Study design and population

This study used a prospective cross-sectional approach. The investigation included 116 hospitals distributed in 14 provinces in eastern, central and western China. The hospital administrators included hospital management personnel and clinical departments composed of clinical directors, head nurses, medical departmental staff, the dispute handling department, staff of the department of nursing and staff working in the outpatient department. The other part included inpatients in outpatient clinics and departments at high risk of violence.

Data collection

Data were collected from July 2015 to July 2016. Respondents filled out an anonymous questionnaire (name/identification to meet requirements) after obtaining volunteer consent. A total of 4060 questionnaires were distributed and 3693 valid questionnaires were retrieved (total effective rate 90.96%: response rate for hospital administration 92.03% and for patients 88.37%).

Questionnaire

Based on the broken windows theory, Perezem, Zeissman and Berry (PZB), three scholars, put forward the quality of service model (Service Quality Model), and the relevant literature to design the questionnaire.¹⁸ Ten experts, including health service management experts, public health specialists and administrative departments, were consulted, and the questionnaire was revised and refined after discussion (R=0.938, obtained from test-retest reliability). The validity of the data was analysed by Kaiser-Meyer-Olkin (KMO)=0.832, and 80 questionnaires were not included in the final data analysis. The data were analysed by the survey questionnaire of 80 hospital managers.

Data analyses

Data were analysed using IBM SPSS Statistics V.19.0. Descriptive statistics were used to analyse the demographic characteristics and frequency of the hospital administrators and patients. Principal Component Analysis and Exploratory Factor Analysis were used to determine the causal factors of the hospital administrators and patients.

Ethical approval

The protocol was approved by the Ethics Committee of the School of Public Health, Harbin Medical University, China. The medical ethics content and the implementation of the research project were in compliance with requirements (No.: 2014005; 1 March 2014).

Table 1 The basic situation of hospital administrator (n=2644)

Characteristic	N	Per cent (%)
Gender		
Male	846	32
Female	1798	68
Age (years)		
≤30	844	31.9
31–40	762	28.8
41–50	759	28.7
51–60	270	10.2
>60	9	0.3
Level of education		
<Bachelor	743	28.1
Bachelor	1606	60.7
≥Master	295	11.2
Job grade		
Director	393	14.9
Matron	186	7.0
Section manager	208	7.9
Section staff	1733	65.5
The competent leadership	124	4.7
Monthly income (RMB)		
<3000	1117	42.2
3000–5000	1233	46.6
5000–10000	273	10.3
>10000	21	0.8
Monthly income satisfaction		
Great satisfaction	109	4.1
Satisfaction	625	23.6
General	1082	40.9
Displeasure	585	22.1
Great dissatisfaction	243	9.2

RESULTS

The basic situation of the survey object

Demographic statistics of hospital administrators

Among the 2644 respondents who were hospital administrators, there were 1798 (68%) females and 846 (32%) males, while 2365 were younger than 50 years. More than half of the hospital administrators were surveyed (65.7%), and a monthly income satisfaction of 1082 RMB (40.9%) among medical personnel was general, with the monthly income of hospital administrators 3000–5000 RMB. The specific characteristics of the medical personnel are shown in [table 1](#).

Table 2 The basic situation of patients (n=1049)

Characteristic	N	Per cent (%)
Gender		
Male	461	43.9
Female	588	56.1
Level of education		
≤Junior high school	428	40.8
Senior middle school	359	34.2
Bachelor	243	23.2
≥Master	19	1.8
Monthly income (RMB)		
<1000	212	20.2
1001–3000	496	47.3
3001–5000	254	24.2
5001–8000	60	5.7
>8000	27	2.6
How to pay for medical expenses		
Completely their own medical expenses	215	20.5
Urban employee basic medical insurance	333	31.7
Urban resident basic medical insurance	191	18.2
New rural cooperative medical	237	22.6
Commercial medical insurance	22	2.1
Other	51	4.9

Demographic statistics of patients

In the survey of 1049 patients, 588 were females (56.1%) and 461 males (43.9%). Most of the participants were educated to junior high school or senior middle school level, 40.8% and 34.2%, respectively. Out of the 1049 patients, most purchased medical insurance, with only 4.9% patients choosing to pay for health themselves. Specific characteristics of the patients are shown in [table 2](#).

Analysis of the factors inducing workplace violence in hospitals

In total, 3693 copies of the data were collected by the Likert 5-point scale from the two different perspectives of medical staff and patients, using exploratory factor analysis to reduce the dimensions of inducing factors. The two-scale KMO values calculated for patients were 0.934 and 0.956, which is within the scope for factor analysis (KMO value close to 1, so the variables are suitable

for factor analysis). Bartlett's test was used to analyse the correlation between variables. Results showed that the p value was below 0.001, so variables were relatively independent. Hence, these data could be used for factor analysis.

Analysis of the factors inducing HWPV from the perspective of hospital administrators

A total of 39 items were screened on the scale, and elements were excluded according to the following criteria: a factor load of <0.40; a higher load on multiple factors; a factor with less than three items included.

After finishing the orthogonal rotation of the factor load matrix, to eliminate six entries, 'spend more money to treat the appropriate guidelines', 'diagnosis and treatment time is shorter', 'public recognition and evaluation of the medical industry is not high', 'public awareness of the degree of medicine is not enough', 'socially adverse factors' and 'medical insurance coverage is incomplete', the six items in the two factors appeared on the higher load, so it was removed. The remaining 37 items make the characteristic root >1, the maximum variance was orthogonal rotation, six factors were extracted from the system, and the cumulative variance contribution rate of 65.80% is shown in [table 3](#).

From [table 3](#) it can be clearly seen that 33 observational variables are clearly classified into six common factors. F1 contained X1–X8 (eight observation variables); F2 contained X9–X15 (seven observation variables); F3 contained X16–X22 (seven observation variables); F4 contained X23–X27 (five observation variables); F5 contained X28–X30 (three observation variables) and F6 contained X31–X33 (three observation variables).

Six factors were named according to the characteristics of the variables observed. F1 is 'the policy and institutional factor', F2 is 'the medical staff factor' F3 is 'patient-related factors', F4 is the 'hospital environmental factor', F5 is 'the objective events factor' and F6 is 'social psychological factors'.

Analysis of factors inducing HWPV from the patient's perspective

The 39 items in the inducing factors were screened, and the factors that were <0.40 of the variance of the common factor were removed. The load was higher in the multiple factors; a factor containing fewer than three items. To eliminate 'the layout of hospital departments is unreasonable', 'medical treatment processes are more cumbersome', 'waiting times are too long', 'the personality of patients extremely irritable', 'the patient is irritable because of the stress of the disease itself and other aspects', 'patients do not understand the hospital rules' and 'the perpetrators of previous HWPV were not penalised accordingly', which was seven entries, the seven items in the two factors appeared on the higher load, so it was removed. The remaining 32 items make the characteristic root >1, the maximum variance orthogonal rotation, three factors were extracted from the system and the cumulative variance contribution rate of 64.0% as shown in [table 4](#).

It can be seen from [table 4](#) that 32 observational variables are clearly classified into three common factors. F1 contained X1–X15 (15 observational variables); F2 contains X16–X25 (10 observational variables); F3 contains X26–X32 (7 observational variables). Three factors are named according to the characteristics of their observed variables, F1 is 'medical staff factors', F2 is 'patient factors' and F3 is 'governmental factors'.

The results of the research above make public comments according to the nomenclature used in the table, modifying elements of public opinion in the table. Senior public health experts and administrators conducted two rounds of discussions on the initial factors and summary, finally making the following changes to patients with predisposing factors.

In the first round of consultations, the 'medical staff factors' were revised to 'hospital-related factors'; 'patient factor' was revised to 'patient-related factors'; 'governmental factors' was changed to 'social and governmental factors'. The second round of consultations deemed that, because 'the patient's understanding of the medical staff is not enough' is a part of patient-related factors, it should be incorporated into the 'patient-related factors' dimension, instead of the 'hospital-related factors' dimension. Also, 'treatment of the disease requires spending an unbearable amount of personal money' should be incorporated into the 'patient-related factors' dimensions rather than 'hospital-related factors', and 'socially adverse factors' should be incorporated into the 'social and governmental factors' dimension rather than the 'patient-related factors' dimension. 'Public recognition and evaluation of the medical industry is not high' should be included in the 'social and governmental factors' dimension rather than the 'patient-related factors' dimension. 'Public awareness of the degree of medicine is not enough' should be included in the 'social and governmental factors' dimension rather than the 'patient-related factors' dimension. 'Bad guidance from the media and public opinion' should be included in the 'social and governmental factors' dimension rather than the 'patient-related factors' dimension.

Calculation of the common factor weight of induced factors of HWPV

Calculation of weight factors of the public factors from the perspective of hospital administrators

According to statistical software, the cumulative variance contribution rate of F1–F6 was 65.80%. Based on the factor load matrix, the factor score coefficient was obtained by regression analysis in SPSS V.17.0. According to the principal component coefficient matrix and standardised variables, the scores of the six factors were calculated. Then the weighted mean of the variance contribution rate of each factor was calculated, and the evaluation formula of the comprehensive score was obtained:

$$F=(0.292F1+0.185F2+0.0605F3+0.0458F4+0.0420F5+0.0304F6)/0.658$$

Indicator weight=composite score/model coefficient.

Table 3 Rotation component matrix

	Component					
	F1	F2	F3	F4	F5	F6
X1 Media and public opinion bad guidance	0.841					
X2 The government has not invested enough in health expenditure	0.790					
X3 Health resources are limited	0.787					
X4 Now the medical system is imperfect	0.768					
X5 The relevant laws to deal with medical disputes in not perfect	0.698					
X6 The perpetrators of previous hospital workplace violence were not penalised accordingly	0.650					
X7 Hierarchical medical system is not perfect	0.608					
X8 Medical insurance reimbursement ratio is not high	0.605					
X9 Problems in communication		0.826				
X10 Medical staff attitude is not kind		0.822				
X11 Medical staff to medical service information is not enough explanation		0.809				
X12 Medical staff active service awareness in not strong		0.781				
X13 The technical level of medical staff is not high		0.762				
X14 Healthcare workers do not protect the patient's privacy		0.741				
X15 Doctors use drugs that do not follow the appropriate guidelines		0.690				
X16 The personality of patients extreme irritability			0.798			
X17 The patient is irritable because of the stress of the disease itself and other aspects			0.793			
X18 Patients do not understand the hospital rules and anger in the medical staff			0.775			
X19 The patient will be in the rest of the hospital grievances vent to medical staff			0.739			
X20 Patients with high expectations of medical effects			0.670			
X21 The patient's understanding of the medical staff is not enough			0.665			
X22 Patients lack the legal means to resolve medical errors or accidents			0.570			
X23 Medical environment is noisy				0.822		
X24 The layout of hospital departments in unreasonable				0.770		
X25 Medical treatment process more cumbersome				0.751		
X26 Waiting time is too long				0.613		
X27 Medical environment facilities are not perfect				0.549		
X28 Treatment ineffective					0.742	
X29 Complication occurred in patients or adverse drug reactions occurred in patients					0.738	
X30 Patients with complex disease					0.718	
X31 Conformity psychology of patients and their family members to the hospital workplace violence						0.699
X32 By the same ward medical events of medical disputes or violence						0.686
X33 Patients were investigated for financial compensation						0.650

Table 4 Rotation component matrix

	Component		
	F1	F2	F3
X1 Problems in communication	0.867		
X2 Medical staff attitude is not kind	0.866		
X3 Healthcare workers do not protect the patient's privacy	0.853		
X4 Medical staff active service awareness in not strong	0.851		
X5 Medical staff to medical service information is not enough explanation	0.850		
X6 The technical level of medical staff is not high	0.822		
X7 Complication occurred in patients or adverse drug reactions occurred in patients	0.793		
X8 Treatment ineffective	0.787		
X9 Doctors use drugs that do not follow the appropriate guidelines	0.774		
X10 Diagnosis and treatment time is shorter	0.694		
X11 Medical environment facilities are not perfect	0.662		
X12 Patients with complex disease	0.630		
X13 Medical environment is noisy	0.581		
X14 The patient's understanding of the medical staff is not enough	0.561		
X15 Treatment of the disease to spend too much money personal unbearable	0.447		
X16 Conformity psychology of patients and their family members to the hospital workplace violence		0.827	
X17 The patient will be in the rest of the hospital grievances vent to medical staff		0.784	
X18 By the same ward medical events of medical disputes or violence		0.774	
X19 Patients were investigated for financial compensation		0.726	
X20 Patients lack the legal means to resolve medical errors or accidents		0.725	
X21 Patients with high expectations of medical effects		0.435	
X22 Social adverse factors		0.761	
X23 Public recognition and evaluation of the medical industry is not high		0.702	
X24 Public awareness of the degree of medical in not enough		0.693	
X25 Media and public opinion bad guidance		0.701	
X26 Now the medical system is imperfect			0.784
X27 Health resources are limited			0.772
X28 Medical insurance reimbursement ratio is not high			0.761
X29 The relevant laws to deal with medical disputes in not perfect			0.759
X30 Medical insurance coverage is incomplete			0.739
X31 The government has not invested enough in health expenditure			0.725
X32 Hierarchical medical system is not perfect			0.668

Finally, the weight coefficients F1–F7 of the common factors were 0.119, 0.244, 0.201, 0.195, 0.089 and 0.103, respectively.

Calculation of weight factors of induced factors from the patient's perspective

According to statistical software, the cumulative variance contribution rate of F1–F3 is 64.00%, which is the same as the result with the data analysis method of the hospital administrators above. Finally, the weight coefficient (F1-F3) of each common factor was 0.603, 0.161 and 0.236, respectively.

Comparison and sequencing of induced factors of HWPV

Based on the above analysis, factors inducing workplace violence were compared and sorted. The results indicate that the medical staff factors were the primary factor, followed by patients' factors. From the patient's point of view, the results show that the principal factor is 'medical factors', followed by 'social and governmental factors' (see [table 5](#) for specific details).

Table 5 The weight and ranking of predisposing factors both in medical persons and patients

Medical persons			Patients		
Sequence	Factor	Weight (%)	Sequence	Factor	Weight (%)
1	Medical staff factor	29.40	1	Hospital-related factors	60.27
2	Patient-related factors	20.08	2	Social and government factors	23.64
3	Hospital environmental factor	19.45	3	Patient-related factor	16.09
4	Policy and institutional factor	11.92	4		
5	Social psychological factors	10.26	5		
6	Objective events factor	8.89	6		

DISCUSSION

Triggering factors of HWPV from the perspective of the hospital administrator

The results show that ‘medical staff factors’ are the primary triggering factor of HWPV from the perspective of the hospital administrator. There are seven indicators in this dimension. The top four were ranked by score: ‘poor communication skills’, ‘attitude of medical staff is unkind’, ‘medical staff give insufficient information on the medical service’ and ‘the active service awareness of medical staff is not strong’. The WHO survey found that when the patient complains of a disease, after on average 18s they are interrupted by a doctor. This would make a patient feel that doctors do not let them talk or do not care about them, which could lead to doctor-patient relationship tension. This may be due to the professional training received by medical staff in that they often pay attention to more important things (such as body temperature, blood pressure, etc), but a patient's feelings, behaviour and intention may be ignored. Doctors are expected, by patients, to understand their feelings and, through communication, to empathise and communicate effectively. When patients encounter life-threatening diseases or relations are bereaved, emotional responses are usually strained, involving crying, despair, fear and so on. Patients will become very angry in the face of improper treatment from medical staff. There could be conflicts between doctors and patients, or even a medical event with a vicious wound ensuing.¹⁹

Medical staff with poor communication skills will lead to the broken window problem, therefore, we propose some corresponding countermeasures to repair the broken window. When medical staff and patients try to communicate excessive use of professional terminology, there will be an obstacle to it being effective, and patients will bear the psychological burden. Therefore, using encouraging and appropriate language allows patients to feel cared for and hopeful during the communication process.

Patients' personality and the concept of medical treatment easily leads to workplace violence

Results show that the weight of patients' factors was ranked second from the perspective of the hospital administrator. The dimension contains seven indicators in which ‘the personality of patients who were extremely irritable’, ‘the patient is irritable because of the stress of the disease itself and other aspects’, ‘patients do not understand the hospital rules and become angry with medical staff’ and ‘the patient vents grievances with the hospital to medical staff’ accounted for a large proportion, and these items were related to the personalities of patients. On the one hand, the violence was shown to be directly related to the patients' medical experience and the characteristics of their personality. Patients suffering from disease and life stressors during medical treatments easily produced negative emotions, and even aggressive behaviour.⁹ Patients also often have prejudices where the understanding of medicine is concerned, leading to high expectations of an effective treatment. This may be related to the patients' educational level and medical knowledge.²⁰ Facing increasing HWPV, the patients and their family members should ideally improve their diathesis and medical knowledge. In order for patients to repair the broken window problem for ‘patient-related factors’, they should recognise that doctors are not gods and the medical profession cannot cure every disease.²¹ Our results show that the inductive factors were summarised into six dimensions from the perspective of hospital administrators, and were divided into three dimensions from the patients' perspective. For example, ‘medical staff factors’ contains 13 items from the patients' perspective, and the 13 items cover medical staff and hospital factors. However, there are seven items in this dimension from the medical staff's perspective, and these indicators only represent medical staff factors. Hospital factors are summarised as ‘environmental factors of the hospital’, including the medical environment, medical equipment, the hospital layout and other indicators of evaluation. Patients' ‘environmental factors’ just represent the medical environment.

In addition, the 'social psychological factors' and 'policy system factors' are both classified as an induced factor from the hospital administrator's perspective.

Ability to communicate and service attitude of medical staff from the perspective of patients is an important factor in the induction of violence

The present results show that 'hospital-related factors' are the main predisposing factors from the patients' perspective; the weight coefficient is 60.27% and this weight is much higher than that of other common factors. The dimensions of a total of 13 entries, covering the medical staff and hospital indicators, among them, poor communication skills and rigid attitude of medical staff, provide the larger weight in this dimension. As expected, patients paid more attention to the medical staff's communication techniques and their attitude towards the service. This differs to the hospital administrator's perspective. The survey found that the majority of patients believe that the main responsibility of HWPV falls to the hospital administrator. Some patients think that medical staff have a limited professional expertise or that medical staff lack patience, and hence do not explain the disease and treatment in sufficient detail. Therefore, patients' trust in medical staff is dependent on these issues.²² It may be due to the large number of patients or the limited time for treatments that medical information is not explained fully during medical treatments and so fails always to meet the needs of patients.²³

There are many recommendations for medical workers. They should improve their self-cultivation and quality, use their spare time to enrich their professional knowledge and improve their technical level and attitude to the service. They should also strengthen their communication skills with patients, paying greater attention to the humane care of patients and improving the satisfaction of patients and family members of patients, thereby alleviating the doctor-patient trust crisis. In addition, the results showed that 'ineffective treatment' and 'complications or adverse drug reactions occurred in patients' as medical staff factors from the patient's perspective, and two indices of the hospital administrator are considered to be 'objective events'. It can be seen that patients and the public do not recognise the particularities of the medical industry. The traditional idea of 'as the medicine took effect, the symptoms lessened' is embedded in the public's perception of medical knowledge. This bias is often a potential factor in inducing violence.

The 'broken window' in policy systems

Governmental departments should take some of the responsibility for the occurrence of workplace violence. The present results show that both the hospital administrator and the patient's perspective, 'policy system factors' and 'social and governmental factors' are important factors underlying violence. In recent years, the relevant policy measures have been gradually introduced. For example, in October 2013, the National Health and Family Planning Commission and the Ministry of Public

Security jointly issued a report on 'systemic guidance on the strengthening of hospital safety'. Next, the China Hospital Association and the Chinese Medical Doctors' Association called for medical incidence of violence to be rated as 'zero tolerance'.²⁴ In April 2014, the Supreme People's court, the Supreme People's Procurator, Ministry of Public Security, the Ministry of Justice and the National Health and Family Planning Commission jointly issued to the society 'Opinions on the law for punishing medical crimes in order to maintain normal medical services'.²⁵ Although the relevant policies have been gradually improved, the current laws and regulations on violent injuries to medical staff are not sufficiently solid. In particular, whether the hospital should be defined as a public place remains vague. Effectively combating and curbing medical incidents involving vicious wounds will not be possible, directly affecting the prevention and control of violence. The absence of government supervision of the media has led to public opinion being misinformed, which has caused many unfavourable social events.²⁶ In addition, the treatment system by classification is imperfect and due to the irrational allocation of resources, a situation where tertiary hospitals are overcrowded has appeared. The relevant departments need to improve the laws and regulations in order to repair the policies and systems of the 'broken window'. This includes dealing with violence according to the law and strictly enforcing policies in accordance with the law.²⁷⁻²⁹ Second, it should involve increasing the investment in health expenditure, allocating health resources rationally, reducing the waste of health resources in systems, improving the system for grading diagnoses and alleviating the pressures on medical staff in tertiary hospitals.

The problem of the 'broken window' in the hospital environment and social psychological factors

The results presented here show that the weight of the hospital environmental factor is 19.45%, including five items. Out of these, 'the medical environment is noisy', 'the hospital layout is not reasonable' and 'the medical treatment processes are complicated' constitute a high percentage within the dimensions. This may be related to the characteristics of patients in tertiary hospitals.³⁰ Also, the patients' waiting time is too long and the doctor's treatment time is short, and the complaints mechanisms in some hospitals are imperfect, often ignoring the views of patients or complaints are not able to be resolved in a timely fashion. This may lead to doctor-patient conflict. In the survey, it was found that, mostly, the layout of the hospital departments was viewed as reasonable, especially in the new government-built county hospitals. Here, the environment, the infrastructure and medical equipment/facilities were seen as better, but some earlier hospitals still exist with an unreasonable layout and setting. In the face of the 'broken window', hospital managers need to improve further the environment for medical services and the service itself, optimise the service process and standardise the service behaviour, in

order to improve the quality of the overall service and experience.

The weighting due to the 'social psychological factors' was 10.6%, which included the following four items, where the proportion of the patients' economic compensation was the largest. Hospital administrators believe that some of the violence is driven by economic factors. In the process of the present investigation, it was learnt that some patients in medical disputes do not follow legal proceedings. In order to achieve certain economic interests, they even hire some occupational 'medical disturbance' lawyers to attempt to get more compensation from the hospital. The hospital, in order to maintain its reputation and normal medical order, will often choose to compromise and pay. This has often contributed to the bad herd mentality, which also affects public perception and their evaluation of the medical profession. The patient's pursuit of economic compensation for the 'broken windows' problem is a potential factor in workplace violence.³¹ The first to recognise that a medical disturbance has occurred due to none-objective understanding of errors can appear as irrational activities. The news media need to ensure the social transfer of positive energy, to establish positive, fair and objective concepts and reports of medical disputes should be in line with the actual situation. The media needs to become a link in terms of solving disputes between medical personnel and patients and can promote the development of healthy doctor-patient relationships.³²

Limitations and advantages

Due to time and resource constraints, the present study required data to be collected prospectively and so may be affected by recall bias. The study sample was from 14 Chinese provinces with a wide range of representatives, and so it should represent a sound analysis of HWPV-induced factors. The study is of value in proposing new recommendations for the remission of violence in Chinese hospitals.

CONCLUSIONS

The findings of this study indicate that: 1) hospital administrators and patients have different concerns about factors contributing to HWPV; 2) from the perspective of hospital administrators, communication skills and service attitude are important factors in inducing HWPV; 3) from the perspective of patients, characteristics of personality and medical cognition are more important factors in inducing HWPV; 4) in terms of social factors, economic compensation of medical malpractice is an important factor in inducing HWPV; 5) in terms of environmental factors, management of Chinese medical hospitals, medical procedures and the layout of departments are potential factors underlying the occurrence of HWPV; 6) corresponding defects have been exposed in the healthcare legal system and the system for the supervision of public opinion.

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Contributors LHF designed the study. CYZ, HTM and WX collected data. ZL, XL and LS analysed the data. CYZ, BSP, YZ and LG drafted the manuscript. CYZ and LHF revised the manuscript. All authors have approved the final version of this manuscript.

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