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Nurse-to-nurse horizontal violence in Chinese hospitals and the protective role of head nurse's caring and nurses' group behaviour on it: A cross-sectional study

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Abstract

Aims: This study aimed to analyse the prevalence of nurse-to-nurse horizontal violence in Chinese hospitals and examine the effects of head nurse's caring and nurse's group behaviour on horizontal violence.

Background: Horizontal violence is a serious global problem affecting the nursing profession, but little is known of the issue in Chinese hospitals. Increasing evidence has showed that leadership and group factors are important in facilitating horizontal violence. Whether the head nurse's caring and group behaviour perceived by nurses has protective effects against horizontal violence remains unclear.

Methods: A cross-sectional online-based questionnaire study was performed in seven general hospitals in Hubei Province, China. Data related to the demographic information, horizontal violence, head nurse's caring and group behaviour were collected. Descriptive analyses, chi-squared tests and logistic regression were used for data analysis.

Results: In total, 1942 valid questionnaires were collected, with a 92.70% effective response rate (1942/2095). Of those, 59.1% (1148/1942) of respondents had experienced horizontal violence at least once in the previous 6 months. Covert negative behaviours were more frequently reported. Compared with the low level, moderate and high levels of the head nurse's caring showed a lower risk of horizontal violence (odds ratio [OR] = 0.400, $p < .001$; OR = 0.128, $p < .001$); moderate and high levels of group behaviour also showed a reduced risk (OR = 0.601, $p < .001$; OR = 0.221, $p < .001$).

Conclusion: Horizontal violence is common among Chinese nurses. The head nurse's caring and maintaining a good climate of nurses' group behaviours could serve as protective factors for preventing horizontal violence.

Implications for Nursing Management: This study helps nursing managers identify which specific negative behaviours occur frequently and require special attention. It suggests that nursing managers attach importance to improving their caring ability towards nurses and to creating an amicable climate of group behaviour to buffer against horizontal violence.

1 | INTRODUCTION

Horizontal violence (HV), a kind of interpersonal conflict, is a serious global problem in the nursing profession (Blair, 2013; Doo & Kim, 2020; Rosi et al., 2020). It affects all areas of nursing: For the victims, HV can result in low self-esteem, depression, self-hatred and feelings of powerlessness and even cause physical health problems; for the health care organizations, HV leads to impaired personal relationships and lack of cooperation, toxic working environments, poor patient outcomes, increased turnover and financial damage; and for society, HV reduces the attractiveness of nursing profession and intensifies the shortage of nursing human resources, especially in the context of global aging (Embree & White, 2010; Pien et al., 2019; Woelfle & McCaffrey, 2007). Therefore, it is worth exploring any solutions to HV.

Nursing scholars, mainly in Western countries, have examined the incidence of HV among nurses based on its definition, prevalence, causes and strategies to combat it; however, there is little known internationally of HV in Chinese hospitals. Prior studies have identified variations of negative behaviours in workplace in different cultural contexts (Karatuna et al., 2020; Terzioglu et al., 2016). There are nine major cultural clusters (Confucian Asia, Southern Asia, Middle East, Anglo, Latin Europe, Eastern Europe, Nordic Europe, Latin America and Sub-Saharan Africa) in the world (Karatuna et al., 2020). Confucian culture originated in China and deeply influenced the Chinese people. Chinese working culture emphasizes collectivism, cooperation, protecting face and performance orientation and promotes the ideas of Confucian benevolence, which may lead to HV in the Chinese cultural context having different characteristics from those of other countries (Cheng et al., 2017; Karatuna et al., 2020; Leong & Crossman, 2016). Thus, conducting a well-designed survey on HV in Chinese hospitals will contribute to the worldwide understanding of this problem.

Another research issue that is not yet clear but worth exploring is the role of head nurse's caring and nurses' group behaviours on HV. It is well known that the head nurse and nursing colleagues are the long-term colleagues of every staff nurse in the workplace. Wilmot and Hocker (2017) found that intrapersonal perceptions were the foundation for conflicts such as HV. Whether the degree of caring by the head nurse and group behaviour of other nurses could serve as the protective factors against HV remains unclear. Clarification of this issue will assist in combating HV and is of great significance.

2 | BACKGROUND

HV refers to any hostile, aggressive and harmful behaviour by a nurse or a group of nurses towards a co-worker or group of nurses via displaying negative attitudes, actions, words and/or other behaviours at the same hierarchical levels in an organisation (Embree & White, 2010; Longo & Newman, 2014; Taylor, 2016). Woelfle and McCaffrey (2007, p. 126) defined HV as 'interpersonal conflict' among nurses. This term is often used interchangeably with bullying in the nursing literature, but there are subtle differences in the meaning. Bullying is described as being more deliberate and repetitive and can occur across a power gradient, whereas in HV, it has been emphasized that the violence occurs among the workers at the same status and HV is not required to be repeated over time (Longo & Newman, 2014; Vessey et al., 2009). In this study, we focus on HV.

Diverse sources have shown that the prevalence of nurse-to-nurse HV varies across different areas. In the United States, the prevalence of nurse-to-nurse HV ranged from 25.3% to as high as 87.4% (Dunn, 2003; Sellers et al., 2012). One survey in New Zealand revealed that over 50% of the staff nurses in their first practising year recognized that they were undervalued by other nurses (McKenna et al., 2003). Morrison et al. (2017), in Jamaica, found that 96% of registered nurses had been exposed to HV, and three quarters rated the exposure as moderate to severe. Ayakdaş and Arslantaş (2018), in Turkey, reported that 47% of nurses had suffered HV. Bambi et al. (2014), in Italy, found that 79.1% of nurses had experienced some form of HV at least once, whereas 22.4% experienced HV at least weekly. A survey performed in Spain showed that 74.2% of nurses had experienced HV at least once in the previous 6 months (Topa & Moriano, 2013). However, little is known about nurse-to-nurse HV in Chinese hospitals. Scholars have pointed out that the occurrence of HV in the nursing profession is related to the local

culture (Bambi et al., 2018). Chinese Confucian philosophy is a typical representative of the Eastern culture, which has a profound impact on the Chinese people. The ideas of collectivism and benevolence are highly valued by individuals and organizations in this kind of culture (Cheng et al., 2017). The question of whether nurse-to-nurse HV is less prevalent in Chinese hospital may thus be raised, together with the characteristics of HV in this context. This is a meaningful research topic worthy of exploration.

To date, there still is a global lack of systematic and effective prevention and management measures against HV. Exploring effective protective factors to prevent HV may assist in reducing its incidence. According to the Society Ecosystems Theory, human behaviour involves multiple systems (i.e., micro, mezzo and macro systems) in the social environment, in which the nurse managers and co-workers form the mezzo system (Johnson, 2011; Zastrow et al., 2017). Increasing evidence has shown that leadership and group factors play important roles in facilitating HV; that is, HV is not just a binary issue between the victim and the perpetrator (Fontes et al., 2019; Kaiser, 2017; Samsudin et al., 2020; Topa & Moriano, 2013).

In China, the head nurse is the first-line nurse manager in an individual department and directs the other nursing staff in the performance of the nursing tasks in a ward. A recent study conducted by Kaiser (2017) found that the behaviours of the nursing leader can have a significant impact on the level of negative behaviours among the nurses. Nowadays, caring has been increasingly positioned as one of the core concepts for an evolved nursing science (Watson, 2009). Some scholars have described caring as an affect, a feeling of compassion or empathy towards the recipient of care, and consider that the staff nurses' perceptions of nurse managers' caring influenced their job satisfaction and well-being (Cortis & Kendrick, 2003; Kostich et al., 2020; Turkel & Ray, 2004). To date, it is still not known whether the head nurse's caring as perceived by nurses can significantly affect the occurrence of HV.

Another important variable used in the present study was the nurse's group behaviour. Group behaviour is defined as collaboration and consensus in a group according to Stone's integrative model for organizational climate of staff working conditions (He et al., 2011; Stone et al., 2005). Nursing staff work as a group in a unit to provide the nursing care for patients. A previous study by Topa and Moriano (2013) identified that group support as a negative predictor of HV. In the same vein, researchers have underlined that work group factors create a favourable atmosphere for occurrence of HV (Blackstock et al., 2018; Crawford et al., 2019; Hutchinson et al., 2010; Topa & Moriano, 2013).

Based on this evidences, we hypothesized that the more positively nurses perceived the head nurse's caring and the nurses' group behaviour, the less HV would occur. However, as yet, there is no direct evidence to support this hypothesis. Bridging this gap will help nurse managers and policymakers recognize the importance of caring for subordinates and develop more effective approaches at the organizational level to mitigate HV. Therefore, the purpose of this study was to (a) investigate prevalence of nurse-to-nurse HV in Chinese hospitals over a 6-month period and to analyse it in terms of different demographics and (b) to examine the protective role of the head nurse's caring and nurses' group behaviour on HV from the perspective of HV victims.

3 | METHODS

3.1 | Study design

A cross-sectional online-based questionnaire study was performed from 1 January to 31 January 2021. Four tertiary general hospitals and three secondary general hospitals from Wuhan, the capital of Hubei Province, and three prefecture-level cities located in the southeast, south-west and the north of Hubei Province were selected as target hospitals using a convenience sampling method, with a total of 4500 eligible nursing staff meeting the study criteria. The study was reviewed and approved by the Ethics Committee.

3.2 | Participants

According to previous studies, the HV rate in general hospitals was 78.2% (Xie et al., 2019). The sample size was calculated using the following formula: $n = z_{1-a/2}^2 p(1-p)/d^2$, where n is equal to the minimum required sample size, a is equal to type I error (0.05), $z_{1-a/2}$ is equal to level of confidence (1.96), p is equal to parameter for sample calculation (78.2%) and d is equal to margin of error (0.03). Based on this formula, a sample size of 728 anticipated for the study. Considering the 15% dropout rate, the final minimum sample size was 857. The inclusion criteria of the participants were as follows: registered nurses working in a hospital, who agreed to take part in the anonymous survey and who had worked in the clinical nursing unit for at least 6 months. Nurses with leadership positions (such as head nurses and nurse administrators) were excluded from the samples. An informed consent form which explained the study's purpose, risks, benefits, anonymity, voluntary participation and the right to withdraw participation was distributed to the participants before their participation.

3.3 | Data collection

The data were collected using a self-reported questionnaire via the service of Wenjuanxing (https://www.wjx.cn/). Informed consent forms and the survey link were distributed to every clinical department through WeChat and Tencent QQ group with the assistance of nursing administrators of the nursing department from the recruited hospitals. WeChat and Tencent QQ are the two most popular instant chat tools in China and are widely used in work. Each participant filled in the questionnaire through clicking the survey link or scanning the QR code. Only one questionnaire was allowed from each IP address. All questions were set as compulsory. If there was any missing item, the respondents would be reminded when he or she submitted their survey. Only when they had completed all the questions could they

submit the survey successfully. Their participation was both voluntary and anonymous.

3.4 | Measures

3.4.1 | Demographic characteristics

Data concerning gender, age, years of working experience, marital status, education, contract status, professional title, type of unit and hospital level were systematically collected.

3.4.2 | Horizontal violence

The Chinese version of the nurse-to-nurse Negative Acts Questionnaire was used. This was developed by Li (2011) based on the English version of the Negative Acts Questionnaire-Revised (Einarsen et al., 2009). The questionnaire included 19 items, containing 8 items of overt type behaviours and 11 items of covert type behaviours. It was developed to measure the exposure of nurses to HV within the previous 6 months, with the various response alternatives: '1 = never', '2 = very rarely', '3 = almost once a month', '4 = almost once a week' and '5 = almost every day'. The respondents were instructed to consider the behaviours of only fellow nurse co-workers and exclude the behaviour of their supervisor or nonnursing individuals (such as physicians and patients). The Chinese version of the nurse-to-nurse Negative Acts Questionnaire has been substantiated for validity and reliability, and the internal reliability of Cronbach's alpha coefficient was found to be .95 in the previous study (Li, 2011; Wang et al., 2018). Cronbach's alpha coefficient was .98 in this study.

3.4.3 | Head nurse's caring

The head nurse's caring was measured using a 36-item Chinese version of the Caring Assessment Tool-administration, which was originally developed on the basis of the American nursing population by Duffy and adapted and validated by Peng et al. (2020) for use with Chinese nurses (Watson, 2009). There were two items that were deleted from the original English version in the process of cross-cultural adaptation. The scale had three different dimensions: decision making, human respect and noncaring behaviours, which were designed to capture staff nurses' perceptions of their managers, using a 5-point Likert-type response scale (1 = never; 2 = rarely; 3 = occasionally; 4 = frequently; and 5 = always). The respondents were asked about the degree of caring they had perceived from the head nurses in the workplace. Ten items were intentionally worded negatively to minimize the chance of errors. The available options were reverse coded during analysis to prevent misinterpretation. The higher the score, the more the caring was perceived by nurses from head nurses. Cronbach's alpha coefficient was found to be .97 in this study. The extreme group analysis method was used to classify the

level of head nurses' caring: The scores equal to and below quartile 1 were classified as 'low' levels, the scores in the range between quartile 1 and quartile 3 were classified as 'moderate' level, and scores equal to and above quartile 3 were classified as 'high' levels.

3.4.4 | Nurses' group behaviour

An eight-item subscale derived from the Nurse's Organizational Climate Scale was used to measure nurses' group behaviour. The total scale was developed by He et al. (2011) based on the theoretical framework of Stone's integrative model of health care working conditions on organizational climate and safety. The respondents indicated their agreement using a 4-point Likert-type response scale: 1 = strongly disagree to 4 = strongly agree. Higher scores indicated a better group behaviour in the organisation. Cronbach's alpha coefficient of this subscale was .95 for the present study. The level of group behaviour was categorized as 'low', 'moderate' and 'high' levels using the same way as the classification of the degree of caring of the head nurse.

3.5 | Data analysis

The data were analysed using IBM SPSS Statistics software Version 21.0 (IBM Corp., Armonk, NY, USA). According to the previous study (Xie et al., 2019), we treated the dependent variable, HV, as a binary variable (yes and no). If the respondents chose 'never' on all 19 items, that is, the score equalled 19, they were judged to be 'no, they haven't suffered HV'. If the total score was greater than 19, they were judged to be 'yes, they have suffered HV'. The demographic variables, head nurse's caring and group behaviour perceived by the nurses were treated as independent variables.

Descriptive statistics were used to analyse the demographic characteristics of the respondents, as well as the frequency and percentage of HV. A chi-squared test was conducted to test the potential association between nurses with and without HV in the terms of various demographic characteristics. Significant factors of demographic characteristics and the target variables (head nurse's caring and nurses' group behaviour) were modelled into the logistic regression analysis to estimate the effect of selected potential factors on HV. Univariate and multivariate logistic regression analyses were conducted to calculate unadjusted odds ratio (OR) and adjusted OR, respectively, by using enter method. All tests were two sided with a significance level of .05.

4 | RESULTS

4.1 | Sample demographic characteristics

Among the 4500 eligible staff nurses, a total of 2095 consented to participate in the study, resulting in an overall response rate of 46.6% (2095/4500). After double-checking the data, 153 questionnaires

were deleted because the respondents did not meet the inclusion criteria or the response was illogical. Finally, a total of 1942 respondents were included in the analyses, with a valid response rate of 92.70% (1942/2095). The respondents were aged 20–58 years (M = 30.32, SD = 6.30), and their working experience in the nursing profession ranged from 1 to 39 years (M = 8.65, SD = 6.71). Other demographic details are shown in Table 1. The result of the chi-squared test showed that there was no statistically significant difference in the demographic variables between the group that experienced HV and the group that did not experience HV, except for the different unit types ($\chi^2 = 17.070$, $p = .017$).

4.2 | Prevalence of nurse-to-nurse HV over the previous 6 months

A total of 1148 (59.1%) of respondents had experienced some form of nurse-to-nurse HV at least once during the previous 6 months, and 156 (8.0%) nurses reported being subjected to it at least weekly. The total score of respondents in this study ranged from 19 to 95 (M = 25.17, SD = 11.04). Of the 19 items, withholding information, ignoring opinions and spreading of gossip/rumours were the most frequent negative behaviours, and they were all covert behaviour. Repeated reminders of one's errors or mistakes were the most frequent overt type of negative behaviours. The specific scores for each item and the frequency ranking of each negative behaviour have been shown in Table 2.

4.3 | Predictive effect of head nurse's caring and nurses' group behaviour on HV

In this study, the total scores of the head nurse's caring ranged from 55 to 180 (M = 147.25, SD = 25.81), and nurses' group behaviour ranged from 8 to 32 (M = 27.67, SD = 4.91). Multivariate logistic regression analysis indicated a reduced risk of HV for nurses with higher levels of head nurse's caring and group behaviour (Table 3). Compared with the low level of head nurse's caring, the moderate and high levels showed a low ORs (OR = 0.400 and OR = 0.128, respectively). Compared with the low level of group behaviour, the moderate and high levels also showed lower ORs (OR = 0.601 and OR = 0.221, respectively). The findings indicate that head nurse's caring and group behaviour had moderate to strong negative association with HV and indeed played a protective role against HV. A significant chi-squared test ($\chi^2 = 533.885$, $p < .001$) and a non-significant Hosmer and Lemeshow test ($\chi^2 = 6.247$, $p = .620$) supported the model as well. Following the Nagelkerke R^2, the model explained 32.4% of the variance in exposure to HV behaviour.

5 | DISCUSSION

The current study measured the prevalence of HV over a 6-month period among staff nurses at the seven general hospitals in Hubei Province of China, involving a large sampling survey of 1942 respondents, and thus makes a significant contribution to the ever-increasing global information on HV in nursing profession. The study also examined the predictive effects of head nurse's caring and nurse's group behaviour on HV from the perspective of HV victims.

In this study, 59.1% of (n = 1148) nurses reported HV experience at least once, which is lower than the 74.2% who reported being subjected to HV in Spain, the 79.1% in Italy and the 87.4% in New Jersey, but higher than the 47% in Turkey and the 34% in New Zealand (Ayakdaş & Arslantaş, 2018; Bambi et al., 2014; Dunn, 2003; McKenna et al., 2003; Topa & Moriano, 2013). Meanwhile, the percentage of nurses in this study who experienced HV at least once a week was significantly lower than the finding of 22.4% among Italian nurses (Bambi et al., 2014). A possible explanation for this might be that different countries and organizations have different cultures in terms of power distance, collectivism, and performance orientation (Karatuna et al., 2020). Confucian culture attaches much importance on performance orientation, which may increase the work-related stress, thus increasing the risk of exposure to HV (Karatuna et al., 2020; Topa & Moriano, 2013). However, it also values harmony with others, and organizations in this culture have a lower power distance, which may reduce the occurrence of HV. The interplay of these impacting factors results in a moderate level of HV experienced by Chinese nurses compared with other countries. Another possible reason for this variation may be attributed to the presence of different psychological tools and threshold standards to measure HV (Bambi et al., 2018). To date, there is no uniform definition of the term HV, which leads to some differences in measurement. Further research is needed to standardize a clear operational definition and develop a unified measuring tool for HV assessment.

What is surprising is that no significant differences were found in terms of gender, age, seniority, marital status, education, contract status, professional title or hospital level between the group with HV and the group without HV in our sample. Obstetrics/gynaecology and emergency room/outpatient units had higher risks of HV compared with the medicine unit in this study. This finding is partially consistent with the review of Bambi et al. (2018) who showed that gender, age, seniority and nursing education are not related to nurse-to-nurse HV, but differs from that of Xie et al. (2019) who found that gender, marital status, professional title and seniority were associated with HV among Chinese nurses. The result further confirms that nurse-to-nurse HV has different characteristics in different organizations and regions.

This study reveals that covert type of HV behaviours was more common than overt types among Chinese nurses, which is consistent with the data reported in other similar studies (Bambi et al., 2014; McKenna et al., 2003; Xie et al., 2019). This may be related to the female-dominated nature of the nursing profession. Females are generally thought to be good at using indirectly aggressive strategies because successful indirect aggression can be very effective and it is difficult to identify the perpetrator, which could help the perpetrator to effectively avoid counter-attacks (Strandmark & Hallberg, 2007). Another possible explanation is that nurses are reluctant to have face-

TABLE 1 Demographic characteristics and variations of two groups among different characteristics (N = 1942)

Characteristics	n (%)	Group with HV (n = 1148)	Group without HV (n = 794)	χ^2	p
Gender					
Male	70 (3.6)	44	26	0.421	.516
Female	1872 (96.4)	1104	768		
Age (years)					
20–25	447 (23.0)	242	205	7.251	.123
26–30	760 (39.1)	454	306		
31–35	399 (20.5)	247	152		
36–40	203 (10.5)	120	83		
≥41	133 (6.9)	85	48		
Years of experience					
≤3	419 (21.6)	232	187	3.212	.201
4–10	1006 (51.8)	602	404		
≥11	517 (26.6)	314	203		
Marital status					
Unmarried	687 (35.4)	401	286	0.248	.883
Married	1215 (62.6)	723	492		
Widowed and divorced	40 (2.0)	24	16		
Education					
Secondary or advanced diploma	404 (20.8)	229	175	1.247	.280
Bachelor's degree or above	1538 (79.2)	919	619		
Contract status					
Permanent	761 (39.2)	463	298	1.544	.219
Temporary	1181 (60.8)	685	496		
Professional title					
Nurse	496 (25.5)	273	223	5.442	.066
Nurse practitioner	1031 (53.1)	616	415		
Nurse-in-charge and above	415 (21.4)	259	156		
Type of unit					
Medicine unit	546 (28.1)	310	236	17.070	.017*
Surgical unit	408 (21.0)	238	170		
Obstetrics/gynaecology	128 (6.6)	87	41		
Paediatrics	96 (4.9)	50	46		
Emergency room/outpatient unit	197 (10.2)	132	65		
Intensive care unit	174 (9.0)	108	66		
OR/PACU	146 (7.5)	91	55		
Other	247 (12.7)	132	115		
Hospital level					
Tertiary hospital	1373 (70.7)	821	552	0.901	.361
Secondary hospital	569 (29.3)	327	242		

Abbreviations: HV, horizontal violence; OR, operation room; PACU, postanaesthesia care unit.
*p < .05.

to-face interpersonal conflicts with their colleagues because Chinese people concerned about face-saving under the influence of Confucian culture.

Moreover, the findings indicated that head nurse's caring and a good climate of nurse's group behaviour were indeed two negative predictors of HV, which supported the hypotheses tested. These relationships may partly be explained by the cultural value that Chinese people believe in reciprocity. That is, when nurses perceive that their efforts and gains are balanced in interpersonal relationships, benign interpersonal interactions will continue, thereby reducing the

TABLE 2 The specific scores for each item and the frequency ranking of each negative behaviour (N = 1942)

Rank[a]	No.	Type	Item	Mean ± SD	1 n (%)	2 n (%)	3 n (%)	4 n (%)	5 n (%)
1	1	Covert	Other nurse withholding information that affects your performance	1.53 ± 0.78	1166 (60.0)	618 (31.8)	88 (4.5)	53 (2.7)	17 (0.9)
2	13	Covert	Having your opinions ignored	1.45 ± 0.71	1257 (64.7)	566 (29.1)	69 (3.6)	38 (2.0)	12 (0.6)
3	5	Covert	Spreading of gossip and rumours about you	1.44 ± 0.75	1299 (66.9)	517 (266)	66 (3.4)	41 (2.1)	19 (1.0)
4	11	Overt	Repeated reminders of your errors or mistakes	1.39 ± 0.71	1370 (70.5)	458 (23.6)	60 (3.1)	41 (2.1)	13 (0.7)
5	4	Covert	Having key areas of responsibility removed or replaced with more trivial or unpleasant tasks	1.39 ± 0.73	1383 (71.2)	437 (22.5)	61 (3.1)	45 (2.3)	16 (0.8)
6	3	Covert	Being ordered to do work below your level of competence	1.39 ± 0.77	1411 (72.7)	400 (20.6)	59 (3.0)	49 (2.5)	23 (1.2)
7	2	Overt	Being humiliated or ridiculed in connection with your work	1.28 ± 0.67	1442 (74.3)	380 (19.6)	62 (3.2)	38 (2.0)	2.0 (1.0)
8	6	Covert	Being ignored or excluded by other nurse	1.34 ± 0.68	1452 (74.8)	390 (20.1)	53 (2.7)	33 (1.7)	14 (0.7)
9	18	Covert	Given too much responsibility without appropriate supervision	1.32 ± 0.66	1479 (76.2)	361 (18.6)	61 (3.1)	30 (1.5)	11 (0.6)
10	14	Covert	Practical jokes carried out by other nurse you do not get along with	1.33 ± 0.70	1481 (76.5)	346 (17.8)	56 (2.9)	42 (2.2)	13 (0.7)
11	16	Covert	Pressure not to claim something to which by right you are entitled (e.g., sick leave, holiday entitlement and travel expenses)	1.33 ± 0.71	1501 (77.3)	313 (16.1)	74 (3.8)	39 (2.0)	15 (0.8)
12	8	Overt	Being shouted at or being the target of spontaneous anger	1.30 ± 0.67	1510 (77.8)	330 (17.0)	58 (3.0)	30 (1.5)	14 (0.7)
13	12	Overt	Persistent criticism of your errors or mistakes	1.28 ± 0.66	1552 (79.9)	292 (15.0)	51 (2.6)	37 (1.9)	10 (0.5)
14	7	Overt	Having insulting or offensive remarks made about your person, attitudes or your private life	1.28 ± 0.67	1563 (80.5)	280 (14.4)	49 (2.5)	36 (1.9)	14 (0.7)
15	15	Covert	Excessive monitoring of your work	1.27 ± 0.67	1570 (80.8)	271 (14.0)	54 (2.8)	33 (1.7)	14 (0.7)
16	17	Overt	Being the subject of excessive teasing and sarcasm	1.27 ± 0.65	1572 (80.9)	279 (14.4)	46 (2.4)	34 (1.8)	11 (0.6)
17	10	Covert	Hints or signals from other nurses that you should quit your job	1.20 ± 0.59	1683 (86.7)	178 (9.2)	45 (2.3)	26 (1.3)	10 (0.5)
18	19	Overt	Threats of violence or physical abuse or actual abuse such as pushing or spitting on you	1.16 ± 0.55	1747 (90.0)	123 (6.3)	38 (2.0)	25 (1.3)	9 (0.5)
19	9	Overt	Being intimidated by other nurses	1.16 ± 0.56	1749 (90.1)	120 (6.2)	34 (1.8)	31 (1.6)	8 (0.4)

Note: 1 = never; 2 = very rarely; 3 = almost once a month; 4 = almost once a week; and 5 = almost every day.
Abbreviation: SD, standard deviation.
[a]The rank was calculated on the basis of the sum of the frequency of Options 2–5. The higher the sum of the frequency, the higher the negative behaviour item was ranked.

likelihood of HV. Although nursing managers may not be directly involved in the HV incidents, they set the tone and expectations in the work environment, which was found to be associated with HV (Lewis & Malecha, 2011). If head nurses show a caring attitude towards their subordinates, they will set a good example for the staff nurses to care for each other, which may create a healthy environment and act as a buffer to HV (Kostich et al., 2020). The findings of this study are promising because they highlight the importance of nurse managers' caring ability for subordinates, which is in accordance

with the core concept of nursing profession and provide new insights to solve the problem of HV among nurses. Further work is encouraged to confirm the results in other cultural contexts.

5.1 | Study limitations

Several limitations are associated with this study. First, because this study used a self-reported survey method based on respondents' own

TABLE 3 Logistic regression analysis with the potential factors (N = 1942)

Potential factors	Univariate logistic regression			Multivariate logistic regression		
	Unadjusted odds ratio	95% CI	*p*	Adjusted odds ratio	95% CI	*p*
Type of unit (reference: medicine unit)						
Surgical unit	1.066	[0.822, 1.382]	.630	1.209	[0.894, 1.637]	.218
Obstetrics/gynaecology	1.615	[1.074, 2.429]	.021*	1.249	[0.777, 2.007]	.359
Paediatrics	0.827	[0.536, 1.278]	.393	0.856	[0.522, 1.404]	.539
Emergency room/outpatient unit	1.546	[1.098, 2.176]	.012*	1.065	[0.729, 1.569]	.751
Intensive care unit	1.246	[0.878, 1.768]	.218	1.124	[0.749, 1.686]	.573
OR/PACU	1.260	[0.866, 1.833]	.228	1.137	[0.738, 1.752]	.560
Other	0.874	[0.646, 1.182]	.381	1.001	[0.704, 1.424]	.995
Head nurse's caring (reference: low level ≤129)						
129 < moderate level < 172	0.240	[0.179, 0.321]	.000***	0.400	[0.290, 0.553]	.000***
High level ≥172	0.050	[0.036, 0.069]	.000***	0.128	[0.087, 0.187]	.000***
Group behaviour (reference: low level ≤24)						
24 < moderate level < 32	0.368	[0.280, 0.484]	.000***	0.601	[0.444, 0.814]	.001**
High level ≥32	0.087	[0.066, 0.114]	.000***	0.221	[0.160, 0.306]	.000***

Abbreviations: CI, confidence interval; OR, operation room; PACU, postanaesthesia care unit.
*p < .05. **p < .01. ***p < .001.

subjective perceptions on HV, the prevalence of nurse-to-nurse HV may not be completely accurate due to possible misunderstanding of the questions included in the survey. Further research could increase the amount of data from various collection sources, including participant observation or in-depth personal interviews. Second, although the current study was a multicentre cross-sectional study from the different regions in Hubei, it only included samples of staff nurses from seven hospitals. So, the results may not be generalized to nurses in other areas, indicating the need to replicate the study with nurses in other areas and hospitals. Third, the HV questionnaire directed the respondents to recall the negative behaviours they had suffered in the previous 6 months, which may have led to recall bias. Finally, causal inferences could not be made due to the cross-sectional data, and further research is needed to explore the exact relationship among nursing managers' caring, group behaviour and exposure to HV.

6 | CONCLUSION

The findings from this study make several contributions to the current literature. First, compared with other countries, the prevalence of HV over a 6-month period among nurses in Chinese hospitals was found to be moderate, with general demographic variables such as gender, age and working experience not found to affect HV in the present cultural contexts, which indicate that future research among Chinese nurses needs to pay attention to additional variables. Second, a high level of caring from head nurses and group behaviour from coworkers were found to be protective factors to against nurse-to-nurse HV. These two factors may serve as effective methods for nursing managers and policymakers to prevent HV in the future.

7 | IMPLICATIONS FOR NURSING MANAGEMENT

This study may help nursing managers worldwide to learn about the status quo of nurse-to-nurse HV in Chinese hospitals and have a better understanding of the cultural differences related to HV. Another implication of the present study is that it helps the nursing managers identify which specific negative behaviours have a high prevalence and require special attention. Moreover, this study recommends that nursing managers might mitigate the occurrence of HV through significantly improving their caring ability towards nurses and creating an amicable climate of group behaviour. Last but not least, it suggests that hospital managers and policymakers should recognize the importance of the head nurses' caring ability for subordinates and include it as an indicator in their performance appraisals.

CONFLICT OF INTERESTS

All the authors declare no conflicts of interest in this study.

ETHICS STATEMENT

The study was reviewed and approved by the Ethics Committee of Tongji Medical College, Huazhong University of Science and Technology (No. S323).

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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