# RESEARCH



# Prevalence and associated factors of workplace violence among Chinese nurses in tertiary hospitals: a national cross-sectional study

Jianghao Yuan<sup>1,2,3</sup>, Jiaxin Yang<sup>1,3,4</sup>, Yiting Liu<sup>1</sup>, Meng Ning<sup>1,2</sup>, Qiang Yu<sup>1</sup>, Xuting Li<sup>1,5</sup>, Zengyu Chen<sup>1,6</sup>, Chongmei Huang<sup>7</sup>, Dan Zhang<sup>2</sup>, Zhenhui Ren<sup>2</sup>, Chunhui Bin<sup>2</sup>, Yamin Li<sup>8\*</sup> and Yusheng Tian<sup>1,3\*</sup>

# Abstract

**Background** Workplace violence (WPV) is a major issue for nurses worldwide, causing both physical and mental harm, and impairing their ability to work effectively. Several researches reported on the prevalence of WPV among nurses in China, ranging from 56.4 to 71%. However, little information is available about the correlates of different types of WPV among nurses across different departments in tertiary hospitals in China.

**Methods** A self-designed WeChat-based questionnaire was utilized, incorporating demographic and occupational factors. WPV was measured using the Chinese version Workplace Violence Scale. Two questions regarding career choices were employed to assess career satisfaction. Descriptive analyses, chi-square tests, and bivariate logistic regression analysis were conducted.

**Results** 122,237 participants were included in the analysis. 26.6% of them experienced at least one form of WPV in the past year. Male sex, shift work, postgraduate education, senior professional title, department, and working more than 50 h per week were factors associated with WPV. Nurses encountered high levels of WPV were less likely to be satisfied with their nursing career.

**Conclusions** WPV is a special concern for Chinese nurses. Interventions to reduce WPV should be conducted by health authorities to create a zero-violence working environment for nurses, and to increase their career satisfaction.

Clinical trial number Not applicable.

Keywords Workplace violence, Nurses, Cross-sectional study

\*Correspondence: Yamin Li aminny@csu.edu.cn Yusheng Tian tianyusheng@csu.edu.cn <sup>1</sup>Clinical Nursing Teaching and Research Section, The Second Xiangya Hospital of Central South University, Changsha, Hunan, China <sup>2</sup>Xiangya School of Nursing, Central South University, Changsha, Hunan, China <sup>3</sup>Department of Psychiatry, National Clinical Research Center for Mental Disorders, The Second Xiangya Hospital of Central South University, Changsha, Hunan, China <sup>4</sup>School of Computer Science and Engineering, Central South University,

Changsha, Hunan, China <sup>5</sup>Department of Thoracic Surgery, The Second Xiangya Hospital of Central

South University, Changsha, Hunan, China <sup>6</sup>School of Nursing, University of Washington-Seattle, Seattle, WA, USA <sup>7</sup>School of Nursing, Ningxia Medical University, Yinchuan, Ningxia, China <sup>8</sup>Hunan Provincial People's Hospital (The First Affiliated Hospital of Hunan Normal University), Changsha 410005, Hunan, China



© The Author(s) 2025. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit http://creativecommons.org/licenses/by-nc-nd/4.0/.



# Introduction

According to the National Institute for Occupational Safety and Health (NIOSH), Workplace violence (WPV) is defined as violent acts directed towards persons at work or on duty [1], This definition was chosen due to its broad applicability and widespread use in international studies [2-4], providing a standardized framework for comparing findings across various healthcare settings. WPV encompasses a range of categories: emotional abuse (EA, mistreatment through words, such as disrespect, cursing, and disparagement), physical assault (PA, physical contact, such as pushing, beating, biting, and spitting), threats (T, use of verbal, written or physical force resulting in fear of negative consequences), verbal sexual harassment (VSH, unwelcome comments or remarks of a sexual nature), and sexual abuse (SA, unwanted touching or other sexual behaviours).

Nurses are the largest professional group in the healthcare sector, and they are most vulnerable to WPV compared to other healthcare professions as they have the closest contact with patients [5]. A meta-analysis of 253 studies showed that the proportion of exposure to any type of WPV (12-month prevalence) was 59.2% for nurses, 56.8% for physicians, and 44.4% for other healthcare professionals [6].

Many studies have reported the prevalence of WPV against nurses. In the United States, Laura McLaughlin and colleagues reported that the pooled prevalence of WPV among nurses was 43% from 2020 to 2022 [7]. A cross-sectional study involving nurses from five European countries (Poland, the Czech Republic, the Slovak Republic, Turkey, and Spain) showed that 54% of nurses experienced non-physical violence, and 20% reported physical violence in the past year [8]. In Africa, Emmanuel Ekpor et al. reported a WPV prevalence rate of 62.3% among 9,831 nurses, with verbal abuse (51.2%) being the most common form [9]. In the South-East Asian and Western Pacific regions, Abin Varghese and colleagues reported a pooled prevalence of WPV to be 58% [10]. According to a meta-analysis by Xin Liu, MS, the 12-month incidence of WPV among Chinese nurses was 71%, with verbal violence (63%) being the most common type [11].

Many studies have shown that WPV negatively impacts nurses' physical and psychological health, leading to decreased job performance and satisfaction, as well as increased turnover intention and burnout, which ultimately results in poor patient outcomes [12–17].

In mainland China, the 2021 National Health Yearbook reported a total of 5 million registered nurses [18]. Many studies have explored the prevalence of WPV and the factors associated with nurses' experiences, such as youth, shift work, weekly working hours exceeding 40 h, and employment in emergency, critical care, or psychiatric departments, all of which increase the likelihood of suffering from WPV [11, 19, 20]. However, some associated factors have led to inconsistent conclusions. For instance, while some studies found that female nurses are more likely to experience WPV [9, 21], others reported the opposite, suggesting that male nurses are more prone to physical forms of WPV [6, 22]. Additionally, some studies have reported a higher prevalence of WPV among unmarried nurses [9], whereas other studies have found a higher prevalence among married nurses [21]. Previous studies have often been limited by small sample sizes or single-center designs, leading to inconsistent conclusions about the prevalence and associated factors of WPV. Moreover, most studies have not differentiated between the prevalence and associated factors of different types of WPV. Therefore, this study aims to conduct a large-scale, multicenter survey across China to investigate the prevalence and associated factors of various types of WPV and their impact on job satisfaction.

# Methods

# Study design and settings

This study utilized baseline data of the Nurses' Mental Health Study (NMHS), a prospective cohort investigation focusing on nurses working within 67 tertiary hospitals across 31 provincial-level administrative divisions (referred to hereafter as 'provinces'), All NMHS-related information can be found in the protocol we have previously published [23].

# Data collection and participants

Cluster sampling was used during baseline recruitment. Hospitals were eligible for inclusion based on the following criteria: they must be general tertiary hospitals, capable of handling a variety of diseases comparable to other tertiary hospitals within their respective provinces. Once a hospital was selected, all nurses working there were invited to participate. The inclusion criteria for nurses were: (1) age of 18 years or older; (2) being a registered nurse officially employed at the hospital; (3) willing to participate in the NMHS study. Exclusion criteria included: (1) nurses on sick leave, maternity leave, or retired; (2) nursing interns.

Data were collected from November 2023 to January 2024 using an online questionnaire. The survey link was generated through "Wenjuanxing" (https://www.wjx.cn /), one of China's largest online survey platforms. Prior to data collection, two researchers with Master's degrees in Nursing were trained by the principal investigator and deemed qualified to assist in explaining the purpose of the NMHS study and the details of each questionnaire item. Subsequently, the survey link was distributed to participants via WeChat, a popular social application in China.

Before beginning the questionnaire, nurses were presented with an informed consent page that explained the purpose of the NMHS study, assured them of their freedom to participate or withdraw at any time. 15 to 20 min were needed to complete the online questionnaire. If they had any questions or concerns, they could contact the researchers via email, phone, or WeChat. Participants in the baseline survey and follow-up studies will be randomly offered ¥1 to ¥100 (US\$0.137 to US\$13.701) as a token of appreciation for completing the questionnaires via online WeChat payment. A total of 147,832 nurses were invited to participate in the survey, with 135,161 online questionnaires returned. After removing duplicates and low-quality responses, 132,910 nurses were included in the baseline data collection for the NMHS, resulting in an effective response rate of 89.91%. Data cleaning was performed by two independent researchers before analysis, involving three steps. First, duplicate questionnaires were removed. If the information of birth month, phone number, and last four digits of the ID number were the same between two questionnaires, the second submission will be removed. Next, praticipants with outliers for the continuous variables were removed, outliers including values below P25-3IQR and above P75 + 3IQR [24, 25]. Finally, logical conflict checks were conducted. For example, if a participant reported years of work experience exceeding their age, it was considered a logical conflict. Questionnaires with more than two such conflicts were excluded. Additionally, 10,673 participants chose 'prefer not to answer' in the WPV were excluded from the analysis. Finally, 122,237 participants were

included in this study. The specific procedure is outlined in Fig. 1.

#### Measures

The variables of the NMHS online questionnaire were developed and determined by the research team based on a previous scoping review [26] and qualitative studies [27].

# Sociodemographic and occupational variables

The sociodemographic variables included age, gender, education level, and marital status, measured through self-designed questions. The occupational variables included working shifts, weekly working hours, years of working experience, and professional title, also measured by self-designed questions.

# Workplace Violence Scale (WVS)

The prevalence and frequency of WPV experienced in the past 12 months were measured using the Chinese version of the Workplace Violence Scale (WVS), which has demonstrated good reliability and validity among Chinese healthcare workers [28]. The scale consists of five items: Physical Assault (PA), Emotional Assault (EA), Threat (T), Verbal Social Harassment (VSH), and Sexual Assault (SA). Each item is scored from 0 to 3 (0 = none, 1 = once, 2 = two to three times, 3 = more than three times), reflecting the frequency of exposure to WPV in the past year. The total score is the sum of the scores for each item, ranging from 0 to 15. The severity of violence is categorized into four levels based on the sum score (None = 0,



Fig. 1 Flowchart of the study participants

Low = 1-5, Medium = 6-10, High = 11-15). The survey provided specific definitions for each type of violence.

#### Career choice

The respondents also answered two questions regarding career choice: "Knowing all the risks, would you still choose to become a nurse? (Yes/No)" and "Would you want your child to become a nurse? (Yes/No)".

# Statistical analyses

In this study, only participants who fully completed the five questions of the Chinese version of the Workplace Violence Scale without choosing "prefer not to answer" were included as valid samples (n = 122237), For details, please refer to Fig. 1 and supplementary material. Responses to whether the respondents had experienced any type of WPV were coded as binary answers (yes/ no). The distribution of demographic and occupational data, along with the prevalence of five types of WPV, was reported in numbers and percentages. In subsequent binary logistic regression analyses, factors associated with each types of WPV, which were specified a priori with a p-value of 0.05 in the chi-square tests, were included to determine significant predictors of the outcome variables (the five types of WPV). The relationship between career choice and WPV levels was examined using chi-square tests. All analyses were conducted using IBM SPSS Statistics Version 27.0 for Windows.

#### Results

# Characteristics of the participants

A total of 147,832 nurses from 67 hospitals in mainland China participated in the survey. After removing duplicates and low-quality questionnaires, those fully and effectively responded to the Chinese version of WVS were considered valid samples for this study. Among these 122,237 individuals, 93.5% were female, 69.0% were married, 31.0% were single, 51.8% held a junior professional title, and 78.2% worked shifts. The age range of the respondents was between 18 and 65 years old, with 36.9% being under 30 years old, and the mean age was  $33.5 \pm 7.3$  years. The distribution of participants according to demographic and occupational characteristics is shown in Table 1.

#### The prevalence and characteristics of WPV

In this study, the prevalence of WPV among Chinese nurses was 26.6% (32,540 out of 122,237). The highest prevalence was for emotional abuse (23.3%), followed by threat (10.1%), physical assault (6.2%), verbal sexual harassment (2.1%), and sexual abuse (1.1%). Significant differences in the prevalence rates of these five types of WPV were observed across demographic and occupational characteristics (Table 1).

Male nurses had a higher prevalence of physical assault (10.8% vs. 5.9%,  $\chi^2$  =316.2, *P*<0.01), threat (11.0% vs. 10.0%,  $\chi^2$  = 7.7, *P*<0.01) compared to female nurses. Conversely, female nurses had a higher prevalence of emotional abuse (23.6% vs. 20.4%,  $\chi^2$  = 42.7, *P*<0.01). There was no significant difference in the prevalence of verbal sexual harassment and sexual abuse between male and female nurses.

Nurses aged under 30 years had the highest prevalence of physical assault (7.4%,  $\chi^2 = 218.7$ , P < 0.01), verbal sexual harassment (3.2%,  $\chi^2 = 331.8$ , P < 0.01), and sexual abuse (1.7%,  $\chi^2 = 191.9$ , P < 0.01) compared to other age groups. Nurses aged 30 to 39 years had the highest prevalence of emotional abuse (23.9%,  $\chi^2 = 43.0$ , P < 0.01), while nurses aged 40 years and over had the highest prevalence of threat (10.6%,  $\chi^2 = 71.2$ , P < 0.01).

Nurses with a master's degree or higher were most vulnerable to all five types of violence (PA, EA, T,VSH, and SA were 8.0%, 25.2%, 12.7%, 2.3% and 1.1%, respectively),

Primary nurses had the highest prevalence of physical assault (6.7%,  $\chi^2 = 71.2$ , P < 0.01), verbal sexual harassment (2.6%,  $\chi^2 = 71.2$ , P < 0.01), and sexual abuse (1.4%,  $\chi^2 = 71.2$ , P < 0.01) among professional title groups. Intermediate nurses had the highest prevalence of emotional abuse (24.2%,  $\chi^2 = 40.8$ , P < 0.01), while senior nurses had the highest prevalence of threat (13.0%,  $\chi^2 = 166.5$ , P < 0.01).

Shift nurses were more vulnerable to physical assault (6.8% vs. 4.1%,  $\chi^2 = 268.9$ , P < 0.01), emotional abuse(24.4% vs. 19.5%,  $\chi^2 = 287.5$ , P < 0.01), threat (10.5% vs. 8.5%,  $\chi^2 = 89.8$ , P < 0.01), verbal sexual harassment (2.3% vs.1.5%,  $\chi^2 = 72.4$ , P = 0.03) and sexual abuse (1.2% vs. 0.7%,  $\chi^2 = 43.9$ , P < 0.01) than non-shift nurses.

Nurses working over 50 h per week were more vulnerable to physical assault (7.3%,  $\chi^2 = 48.7$ , P < 0.01), threat (11.2%,  $\chi^2 = 39.6$ , P < 0.01), verbal sexual harassment (2.5%,  $\chi^2 = 21.9$ , P < 0.01), and sexual abuse (1.41%,  $\chi^2 = 16.6$ , P < 0.01).

Nurses working in psychiatry department had the highest WPV prevalence rate (54.3%), followed by those in emergency department (43.4%), and outpatient department (31.3%). Nurses in operating room had the lowest WPV prevalence rate (7.1%). Psychiatric nurses also had the highest prevalence rates for all types of WPV (PA, EA, T, VSH, and SA were 27.4%, 47.6%, 31.7%, 4.5%, and 54.3%, respectively). The differences in the prevalence of different types of WPV across departments were significant (Table 2).

# WPV levels and career choice

The correlation between the level of WPV and occupational choice is presented in Table 3. A total of 38.5% of respondents reported that they would still choose the nursing profession even if they were more aware of the

Demographic variables	Physical assault n (%)	Emotional abuse n (%)	Threat n (%)	Verbal sexual harassment n (%)	Sexual abuse n (%)
Gender					
Male	866(10.8)	1629(20.4)	877(11.0)	147(1.8)	85(1.1)
Female	6705(5.9)	26,918(23.6)	11,423(10.0)	2450(2.1)	1274(1.1)
X <sup>2</sup>	316.16	42.71	7.69	3.39	0.19
<i>P</i> value	<0.001	<0.001	<0.001	0.066	0.665
Age group(yr)					
<30	2881(7.4)	9106(23.4)	3498(9.0)	1238(3.2)	658(1.7)
30–39	3696(6.1)	14,583(23.9)	6428(10.5)	1084(1.8)	568(0.9)
≥40	994(4.5)	4858(21.7)	2374(10.6)	275(1.2)	133(0.6)
X <sup>2</sup>	218.69	43.03	71.22	331.78	191.87
<i>P</i> value	<0.001	<0.001	<0.001	<0.001	< 0.001
Marital status					
Married or cohabitang	4558(5.4)	19,116(22.7)	8490(10.1)	1318(1.6)	701(0.8)
Separated, widowed, or divorced	210(7.0)	802(26.7)	385(12.8)	88(2.9)	45(1.5)
Never married	2803(8.0)	8629(24.7)	3425(9.8)	1191(3.4)	613(1.8)
X <sup>2</sup>	293.86	74.86	27.45	413.81	195.42
<i>P</i> value	<0.001	<0.001	<0.001	<0.001	<0.001
Education level					
Master degree or above	410(8.0)	1297(25.2)	652(12.7)	120(2.3)	55(1.1)
Bachelor degree	6568(6.2)	25,169(23.6)	10,749(10.1)	2248(2.1)	1192(1.1)
Associate degree or below	593(5.6)	2081(19.6)	899(8.5)	229(2.7)	112(1.1)
X <sup>2</sup>	35.11	99.01	69.26	1.24	0.46
<i>P</i> value	<0.001	<0.001	<0.001	0.539	0.796
Occupational variables					
Professional title					
Senior	329(5.6)	1339(22.6)	770(13.0)	82(1.4)	35(0.6)
Intermediate	3010(5.7)	12,834(24.2)	5778(10.9)	883(1.7)	462(0.9)
Primary	4232(6.7)	14,374(22.7)	5752(9.1)	1632(2.6)	862(1.4)
X <sup>2</sup>	53.50	40.78	166.49	130.80	77.83
<i>P</i> value	<0.001	<0.001	<0.001	<0.001	< 0.001
Work schedule					
Shift	6491(6.8)	23,359(24.4)	10,030(10.5)	2208(2.3)	1163(1.2)
Non-shift	1080(4.1)	5188(19.5)	2270(8.5)	389(1.5)	196(0.7)
X <sup>2</sup>	268.87	287.49	89.80	72.44	43.89
<i>P</i> value	<0.001	<0.001	<0.001	<0.001	< 0.001
Weekly working hours					
≥50 h	1293(7.3)	4229(24.0)	1979(11.2)	447(2.5)	248(1.4)
40–49 h	4482(6.1)	17,817(24.1)	7412(10.0)	1565(2.1)	791(1.1)
≤ 39 h	1796(5.8)	6501(21.1)	2909(9.5)	585(1.9)	320(1.0)
X <sup>2</sup>	48.75	114.16	39.57	21.91	16.65
P value	<0.001	<0.001	<0.001	<0.001	<0.001

risks, while 88.1% stated that they would not support their children becoming nurses. Nurses who experienced WPV in the past year were less likely to answer "yes" to both questions (P<0.01). Among nurses who experienced high levels of WPV in the previous year, only 47 (18.2%) reported that they would still choose to be a nurse, and just 8 (3.1%) would support their children in becoming nurses.

# Associated factors for WPV

Table 4 shows the results of the bivariate logistic regression analysis for five types of WPV-related factors.

Regarding gender, male nurses had a significantly higher risk of experiencing physical assault and threat compared to females (OR = 1.73, 95% CI: 1.60-1.87) (OR = 1.153, 95% CI: 1.07-1.241), while they had a lower risk of emotional abuse (OR = 0.808, 95% CI: 0.763-0.856).

Departments	Physical assault n (%)	Emotional abuse n (%)	Threat	Verbal sexual harassment	Sexual abuse n (%)	Overall n (%)
Internal Medicine	1692(5.4)	8219(26.1)	3257(10.4)	809(2.6)	443(1.4)	29.4
Surgery	1480(5.5)	6961(26.0)	2809(10.5)	642(2.4)	325(1.2)	29.2
Obstetrics and Gynecology	184(2.9)	1231(19.6)	566(9.0)	65(1.04)	29(0.5)	22.0
Otorhinolaryngology	145(3.8)	952(25.0)	397(10.4)	80(2.1)	32(0.8)	27.7
Pediatrics	150(3.6)	912(21.9)	386(9.3)	32(0.8)	11(0.3)	24.0
Psychiatry	238(27.4)	413(47.6)	275(31.7)	77(8.9)	39(4.5)	54.3
Infectious Diseases	83(4.4)	456(24.3)	178(9.5)	43(2.3)	19(1.0)	27.5
Intensive Care Unit	1780(12.4)	2798(19.5)	1217(8.5)	261(1.8)	157(1.1)	24.9
Outpatient Department	365(6.3)	1666(28.8)	815(14.1)	112(1.9)	52(0.9)	31.3
Emergency Department	886(12.3)	2836(39.4)	1502(20.9)	232(3.2)	106(1.5)	43.4
Operating Room	176(1.9)	542(5.7)	223(2.3)	69(0.7)	42(0.4)	7.1
Nursing Department	64(4.6)	226(16.1)	121(8.6)	29(2.1)	17(1.2)	19.0
Other	328(3.8)	1335(15.3)	554(6.3)	146(1.7)	87(1.0)	17.9

# Table 2 The prevalence of five types of WPV in different departments

 Table 3
 Association of career choice and the level of WPV

WPV level	N(%)	Would opt for the profession again a a career choice (%	Would opt for the nursing profession again as a career choice (%)		Would support children to become a nurse (%)	
		Yes (38.5)	No (61.5)	Yes (11.9)	No (88.1)	
High	259(0.2)	47(18.2)	212(81.9)	8(3.1)	251(96.9)	
Intermediate	3741(3.1)	741(19.8)	3000(80.2)	178(4.8)	3563(95.2)	
Low	28,540(23.4)	7722(27.1)	20,818(72.9)	1717(6.0)	26,823(94.0)	
None	89,697(73.4)	38,536(43.0)	51,161(57.0)	12,667(14.1)	77,030(85.9)	
	Ρ	<0.001		<0.001		

WPV level: none = 0, low = 1-5, intermediate = 6-10, high = 11-15

Table 4	Bivariate logistic reg	aression for the association <b>k</b>	petween demographic, occu	pational factors and five types of WPV

Risk factors	Physical assault	<b>Emotional abuse</b>	Threat	Verbal sexual harassment	Sexual abuse
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Male	1.73(1.60-1.87)	0.81(0.76-0.86)	1.15(1.07-1.24)	NA	NA
Shift work	1.56(1.46-1.67)	1.31(1.27-1.36)	1.32(1.25-1.38)	1.33(1.19–1.48)	1.36(1.17–1.60)
Age group(yr)					
< 30	1.26(1.13-1.40)	1.05(0.99-1.11)	0.86(0.79–0.93)	1.85(1.54-2.23)	2.07(1.60-2.68)
30–39	1.22(1.12-1.32)	1.07(1.03-1.12)	0.99(0.94-1.05)	1.34(1.15-1.55)	1.39(1.13–1.72)
≥40	Ref	Ref	Ref	Ref	Ref
Marital status					
Married or cohabitang	Ref	Ref	Ref	Ref	Ref
Separated, widowed, or divorced	1.42(1.23-1.64)	1.27(1.17-1.38)	1.30(1.17-1.45)	2.09(1.68-2.61)	2.04(1.50-2.77)
Never married	1.39(1.30-1.48)	1.20(1.15-1.24)	1.16(1.09-1.22)	1.71(1.54-1.90)	1.54(1.33–1.78)
Education level					
Master degree and above	1.45(1.27-1.66)	1.27(1.17-1.38)	1.32(1.18–1.47)	NA	NA
Bachelor's degree	1.11(1.01-1.21)	1.19(1.13-1.25)	1.11(1.04-1.20)	NA	NA
Associate degree and below	Ref	Ref	Ref	NA	NA
Professional title					
Senior	1.24(1.08-1.42)	1.16(1.07-1.25)	1.50(1.36-1.66)	1.12(0.86-1.45)	0.93(0.63–1.36)
Intermediate	1.08(1.01-1.15)	1.17(1.13-1.21)	1.22(1.16-1.28)	1.06(0.95-1.19)	1.06(0.91-1.24)
Primary	Ref	Ref	Ref	Ref	Ref
Working hours / week					
≥50 h	1.23(1.14-1.33)	1.17(1.12-1.22)	1.17(1.10-1.24)	1.37(1.21–1.55)	1.39(1.18–1.64)
40–50 h	1.03(0.97-1.09)	1.17(1.14-1.21)	1.06(1.01-1.10)	1.11(1.01-1.23)	1.03(0.90-1.17)
≤39 h	Ref	Ref	Ref	Ref	Ref

NA: Not Applicable

Shift work increased the risks for all types of WPV, including PA (OR = 1.56, 95% CI: 1.46–1.67), EA (OR = 1.32, 95% CI: 1.27–1.36), T (OR = 1.32, 95% CI: 1.25–1.38), VSH (OR = 1.33, 95% CI: 1.19–1.48), and SA (OR = 1.37, 95% CI: 1.17–1.6).

For age groups, nurses under 30 years old were more likely to experience physical assault (OR = 1.26, 95% CI: 1.13–1.4), verbal sexual harassment (OR = 1.85, 95% CI: 1.54–2.23), and had a particularly high risk for sexual abuse (OR = 2.07, 95% CI: 1.60–2.68) compared to those aged 40 or above, who were used as the reference group. Nurses aged 30–39 also exhibited increased risks for physical assault (OR = 1.22, 95% CI: 1.12–1.32) and verbal sexual harassment (OR = 1.34, 95% CI: 1.15–1.55) but to a lesser extent than the younger group.

Marital status was another significant factor, with separated, widowed, or divorced nurses at higher risk for most types of WPV, such as physical assault (OR = 1.49, 95% CI: 1.23–1.64), emotional abuse (OR = 1.27, 95% CI: 1.17–1.38), and notably for verbal sexual harassment (OR = 2.09, 95% CI: 1.68–2.61) and sexual abuse (OR = 2.04, 95% CI: 1.51–2.77) when compared to married or cohabiting individuals. Similarly, never-married nurses faced elevated risks for all types of WPV except for threat.

Higher education level, specifically master's degree and above, were linked with greater chances of experiencing physical assault (OR = 1.45, 95% CI: 1.27–1.66), emotional abuse (OR = 1.27, 95% CI: 1.17–1.38), and threat (OR = 1.32, 95% CI: 1.18–1.47) relative to those with an associate degree or below. A similar pattern was observed for nurses with a bachelor's degree, though to a lesser extent.

Nurses with senior professional titles faced higher risks of physical assault (OR = 1.24, 95% CI: 1.08–1.42), emotional abuse (OR = 1.16, 95% CI: 1.07–1.25), and especially threat (OR = 1.5, 95% CI: 1.36–1.66) compared to those with primary professional titles. Nurses with intermediate professional titles also faced increased risks for most types of WPV, although to a lesser degree than those with senior-level titles.

Lastly, nurses working 50 h or more per week had higher risks of experiencing all types of WPV, including PA (OR = 1.23, 95% CI: 1.14–1.33), EA (OR = 1.17, 95% CI: 1.12–1.22), and VSH (OR = 1.37, 95% CI: 1.21–1.55), among others, when compared to those working 39 h or less.

# Discussion

This study explored the prevalence and associated factors of different types of WPV against Chinese nurses in tertiary hospitals, and investigated the relationship between WPV and their career choices. The reported prevalence of WPV among nurses was 26.6%, with the highest rate of emotional abuse at 23.4%. Independent factors associated with WPV include male sex, shift work, education level, professional title, department, and working more than 50 h per week. Nurses who experienced higher levels of WPV reported lower job satisfaction.

# Prevalence of WPV

Our findings indicate that the overall prevalence of WPV among nurses in Mainland China (26.6%) is significantly lower than the prevalence (43%) reported in a recent (2024) meta-analysis of 37 observational studies conducted among nurses in the United States [7]. It is also lower than the overall prevalence (54%) reported by a cross-sectional study involving 1,089 nurses across five European countries [8]. Additionally, it is significantly lower than the 71% WPV prevalence rate among Chinese nurses, as reported in a meta-analysis of 38 observational studies [11]. The lower prevalence of WPV in this study may be due to the methodological approach, particularly the use of cluster sampling, which enabled a larger sample size. Additionally, variations in the measurement tools used could have influenced the results of the study. Furthermore, the relatively standardized safety measures, management practices, and treatment protocols implemented in top-tier hospitals in China may contribute to a safer work environment [29]. Moreover, the increased respect and appreciation for healthcare professionals following the COVID-19 pandemic may have contributed to reducing WPV [30].

#### Sociodemographic and occupational factors and WPV

Our research revealed significant differences in the prevalence of various types of WPV between male and female nurses. The prevalence of physical assault and threatening behavior is higher among male nurses compared to female nurses. In contrast, the rates of emotional abuse, verbal sexual harassment, and sexual abuse are higher among female nurses.

Previous studies have yielded inconsistent findings on this topic. Some research has shown that males are at a higher risk for all types of WPV compared to females [22], while others indicate that men are more likely to encounter physical violence, whereas women are more prone to verbal abuse [31, 32].

A possible explanation for the higher prevalence of physical assault and threatening behavior among male nurses could be their greater presence in acute and critical care units, which exposes them to more situations of potential conflict with patients and their families. A plausible explanation for the higher risk of emotional abuse among female nurses could be that women tend to be more emotionally sensitive, making them more susceptible to the impact of negative emotions [33]. Furthermore, male nurses may underreport emotional abuse incidents due to societal expectations related to masculinity [34]. The higher prevalence of verbal sexual harassment and sexual assault among female nurses might be explained by the societal perception that sexual harassment is primarily understood as heterosexual men harassing women [35], therefore, female nurses report more instances of verbal sexual harassment and sexual abuse.

We found that nurses working shift schedules have higher prevalence rates of all five types of WPV compared to those not working shifts. This finding is consistent with the conclusions of previous studies [12, 36].

Our research findings indicate that nurses under the age of 30 are more vulnerable to physical assault, verbal sexual harassment, and sexual abuse compared to those in older age brackets. Previous studies have similarly indicated that younger nurses are more likely to experience workplace violence [37, 38]. This may be due to their insufficient nursing skills and communication techniques [39], which can provoke patient dissatisfaction and lead to violence. They also may lack effective coping mechanisms to deal with violent incidents [40], making them more vulnerable to physical assault. In addition, young nurses may be targeted for sexual harassment due to their perceived greater physical attractiveness [41].

We found that longer weekly working hours were significantly associated with all five types of WPV. This finding is consistent with the conclusions of previous studies. The longer the working hours per week, the greater the amount of time spent with patients [22], and consequently, the likelihood of experiencing WPV increases.

Nurses with senior professional titles reported higher rates of emotional abuse and threat compared to those with junior titles. China operates a three-tiered nursing system, where a senior professional title typically implies greater responsibility and a heavier workload. Nurses with higher professional titles often have to deal with more complex clinical nursing issues, which could explain why they experience more emotional abuse and threat.

# **Education level and WPV**

Our research found a significant correlation between education level and the risk of WPV. Nurses with masters' degree or above have higher prevalence of all five types of WPV compared to those with a bachelor's degree or lower, which was inconsistent with previous studies [22, 42]. We analyze this as follows: on the one hand, according to Christensen et al. (2024), one of the key factors determining whether nurses report WPV is their perception of WPV [42], nurses with masters' degree or above may have a greater awareness of issues related to WPV and a clearer understanding of the definition and scope of WPV, leading to a higher likelihood of reporting such incidents [19]. On the other hand, nurses with masters' degree or above often take on more responsibilities, participate in more complex medical decisions, and may even manage teams. These duties increase their frequency of communication with patients and their families, which makes them more susceptible to violent behavior from emotionally distressed patients or family members.

#### Department and WPV

The prevalence of different types of WPV and the overall WPV rate among psychiatric nurses are significantly higher compared to nurses in other departments. The primary reason for this is that psychiatric patients often have unstable mental health conditions, leading to a higher frequency of both verbal and physical violent behaviors [10, 36, 43–46]. The severity of WPV among emergency nurses is also high, with possible reasons being that emergency nurses must continually manage urgent and critically ill patients in a fast-paced, highpressure work environment. Such a high-stress setting may cause heightened emotions among patients and their families, thereby increasing the likelihood of violent incidents [45, 47].

### Career satisfaction and WPV

This research indicated that as the level of experienced WPV increased, nurses were less likely to respond 'yes' to the two questions about their career choice. WPV can negatively impact the physical and mental well-being of nurses, leading to lower job satisfaction, diminished quality of life, and a higher risk of staff burnout and turnover [14–17]. These adverse effects may have undermined nurses' trust in the healthcare system, making them more likely to answer 'no' to the two questions.

#### Limitations

The study has some limitations. Firstly, due to its crosssectional design, we are unable to establish a causal relationship between the identified factors and WPV. This limitation will be addressed and refined in subsequent reports of this cohort study. Secondly, the participants were nurses working in tertiary public hospitals in China, and the findings may not be generalized to other types of healthcare workers in different regions or those working in primary and secondary hospitals. Thirdly, the data were collected retrospectively, relying on respondents' ability to recall events from the previous 12 months. This method may introduce recall bias, as participants might not accurately remember past occurrences. Additionally, the survey's reliance on the subjective interpretations of nurses regarding WPV resulted in a less comprehensive delineation of the phenomenon in question.

# Conclusions

WPV remains a significant concern for nurses in China. The prevalence of WPV among clinical nurses identified in this study, along with the discovery of numerous associated factors, underscores the need for targeted attention and intervention strategies. The finding that nurses with graduate degrees are more susceptible to WPV compared to those with undergraduate or lower gualifications calls for particular attention and the development of specific intervention strategies to address this disparity. Clinical nurses who have experienced higher levels of WPV report lower job satisfaction, which can have profound implications for staff retention, quality of care, and the overall well-being of the nursing workforce. It is crucial for health authorities to implement interventions aimed at reducing WPV to foster a clinical nursing environment free from violence.

#### Abbreviations

WPV	Workplace violence
NIOSH	National Institute for Occupational Safety and Health
PA	Physical assault
EA	Emotional abuse
Т	Threat
VSH	Verbal sexual harassment
SA	Sexual abuse
NMHS	Nurses' Mental Health Study
WVS	Workplace Violence Scale

#### Supplementary Information

The online version contains supplementary material available at https://doi.or g/10.1186/s12912-025-02975-4.

Supplementary Material 1

#### Acknowledgements

The researchers would like to express their gratitude to all the nurses in this study.

#### Author contributions

All authors participated in reviewing subsequent drafts and have approved the final version of the manuscript for publication. LYT, YJX, CZY, HCM, ZD, RZH, BCH and TYS assisted in the collection of data from each of the participating centers; NM, YQ, and LXT led the development of the study design; YJH analyzed and interpreted the data; YJH drafted the manuscript; TYS assisted in refining writing details; LYM and TYS were responsible for the supervision, validation, and critical revision of the manuscript.

#### Funding

STI2030-Major Projects (Grant Number: 2021ZD0200700); Chinese Nursing Association (Grant Number: ZHKY202306); Major Scientific and Technological Projects in Hunan Province (Grant Number: 2020SK2085).

# Data availability

No datasets were generated or analysed during the current study.

#### Declarations

#### Ethics approval and consent to participate

The Nurses' Mental Health Study was approved by the Human Ethics Committee of the Second Xiangya Hospital of Central South University (Ethical approval number: LYF20230048). Written informed consent was obtained from individual. All methods were performed in accordance with the guidelines and regulations of the Declaration of Helsinki.

#### **Consent for publication**

Not applicable.

#### **Competing interests**

The authors declare no competing interests.

Received: 3 November 2024 / Accepted: 13 March 2025 Published online: 31 March 2025

#### References

- Violence Occupational Hazards in Hospitals. [http://www.cdc.gov/niosh/docs /2002-101/]
- Hong S, Nam S, Wong JYH, Kim H. Post-traumatic responses to workplace violence among nursing professionals: a collaborative and comparative study in South Korea and Hong Kong. BMC Nurs. 2023;22(1):354.
- Odes R. Measurement and regulation of workplace violence in healthcare settings. San Francisco: University of California; 2021.
- Al-Qadi MM. Workplace violence in nursing: A concept analysis. J Occup Health. 2021;63(1):e12226.
- Escribano RB, Beneit J, Luis Garcia J. Violence in the workplace: some critical issues looking at the health sector. Heliyon. 2019;5(3).
- Liu J, Gan Y, Jiang H, Li L, Dwyer R, Lu K, Yan S, Sampson O, Xu H, Wang C, et al. Prevalence of workplace violence against healthcare workers: a systematic review and meta-analysis. Occup Environ Med. 2019;76(12):927–37.
- McLaughlin L, Khemthong U. The prevalence of type II workplace violence in US nurses 2000 to 2022: A Meta-Analysis. West J Nurs Res 2024;46(3):248–55.
- Babiarczyk B, Turbiarz A, Tomagová M, Zeleníková R, Önler E, Sancho Cantus D. Reporting of workplace violence towards nurses in 5 European countries – a cross-sectional study. Int J Occup Med Environ Health. 2020;33(3):325–38.
- Ekpor E, Kobiah E, Akyirem S. Prevalence and predictors of workplace violence against nurses in Africa: a systematic review and meta-analysis. Health Sci Rep. 2024;7(4).
- Varghese A, Joseph J, Vijay VR, Khakha DC, Dhandapani M, Gigini G, Kaimal R. Prevalence and determinants of workplace violence among nurses in the South-East Asian and Western Pacific regions: a systematic review and metaanalysis. J Clin Nurs. 2021;31(7–8):798–819.
- Liu X, Yang H, Hu Y, Zhou Y, Wang J, Dong L, Zhang M, Liang T. Incidence of workplace violence against nurses among Chinese hospitals: A meta-analysis. J Nurs Adm Manag. 2021;30(6):1490–501.
- Banga A, Mautong H, Alamoudi R, Faisal UH, Bhatt G, Amal T, Mendiratta A, Bollu B, Kutikuppala LVS, Lee J et al. ViSHWaS: violence study of healthcare workers and Systems—a global survey. BMJ Global Health. 2023;8(9).
- Lanctôt N, Guay S. The aftermath of workplace violence among healthcare workers: A systematic literature review of the consequences. Aggress Violent Beh. 2014;19(5):492–501.
- Kim S, Lynn MR, Baernholdt M, Kitzmiller R, Jones CB. How does workplace Violence–Reporting culture affect workplace violence, nurse burnout, and patient safety?? J Nurs Care Qual. 2023;38(1):11–8.
- Li M, Shu Q, Huang H, Bo W, Wang L, Wu H. Associations of occupational stress, workplace violence, and organizational support on chronic fatigue syndrome among nurses. J Adv Nurs. 2020;76(5):1151–61.
- Wang L, Ni X, Li Z, Ma Y, Zhang Y, Zhang Z, Gao L, Liu X, Yan W, Fan L et al. Mental health status of medical staff exposed to hospital workplace violence: a prospective cohort study. Front Public Health 2022;10.
- Yao X, Shao J, Wang L, Zhang J, Zhang C, Lin Y. Does workplace violence, empathy, and communication influence occupational stress among mental health nurses? Int J Ment Health Nurs. 2020;30(1):177–88.
- China health statistics year-book. 2022 [http://www.nhc.gov.cn/mohwsbwstj xxzx/tjtjnj/202305/6ef68aac6bd14c1eb9375e01a0faa1fb.shtml]
- Bagnasco A, Catania G, Pagnucci N, Alvaro R, Cicolini G, Dal Molin A, Lancia L, Lusignani M, Mecugni D, Motta PC et al. Protective and risk factors of workplace violence against nurses: A cross-sectional study. J Clin Nurs. 2024;33(12):4748–58.
- Zhang L, Wang A, Xie X, Zhou Y, Li J, Yang L, Zhang J. Workplace violence against nurses: A cross-sectional study. Int J Nurs Stud. 2017;72:8–14.

- Fu C, Ren Y, Wang G, Shi X, Cao F. Fear of future workplace violence and its influencing factors among nurses in Shandong, China: a cross-sectional study. BMC Nurs. 2021;20(1).
- 22. Tian Y, Yue Y, Wang J, Luo T, Li Y, Zhou J. Workplace violence against hospital healthcare workers in China: a National WeChat-based survey. BMC Public Health 2020;20(1).
- Ning M, Li X, Chen Z, Yang J, Yu Q, Huang C, Chen Y, Tian Y, Li YM, Xiao S. Protocol of the nurses' mental health study (NMHS): a nationwide hospital multicentre prospective cohort study. BMJ Open. 2025;15(2):e087507.
- 24. Ren F, Yu H, Zhao B, Hao Y, Wang J. Identification method research of invalid questionnaire based on partial least squares regression. In 2011 Chinese Control and Decision Conference (CCDC) 2011:1204–1207.
- 25. Seo S. A review and comparison of methods for detecting outliers in univariate data sets. In. 2006.
- Yang J, Chen Y, Tian Y, Li X, Yu Q, Huang C, Chen Z, Ning M, Li S, He J et al. Risk factors and consequences of mental health problems in nurses: A scoping review of cohort studies. Int J Ment Health Nurs 2024;33(5):1197–211.
- 27. Yu Q, Huang C, Tian Y, Yang J, Li X, Ning M, Chen Z, Du J, He J, Li Y. Factors associated with clinical Nurse's mental health: a qualitative study applying the social ecological model. BMC Nurs. 2024;23(1).
- Wang P-x, Wang M-z, Hu G-x, Wang Z-m. [Study on the relationship between workplace violence and work ability among health care professionals in Shangqiu City]. Wei Sheng Yan Jiu. 2006;35(4):472–4.
- 29. Hussein M, Pavlova M, Ghalwash M, Groot W. The impact of hospital accreditation on the quality of healthcare: a systematic literature review. BMC Health Serv Res. 2021;21(1).
- Hu L, Bai L, Zhao S, Lu R. Analysis of Doctor–Patient relationship in Post-COVID-19 period: perspective differences between citizen and medical staff. Inquiry: J Health Care Organ Provis Financing 2021;58.
- Sun L, Zhang W, Qi F, Wang Y. Gender differences for the prevalence and risk factors of workplace violence among healthcare professionals in Shandong, China. Front Public Health. 2022;10.
- Chakraborty S, Mashreky SR, Dalal K. Violence against physicians and nurses: a systematic literature review. J Public Health. 2022;30(8):1837–55.
- Pang C, Li W, Zhou Y, Gao T, Han S. Are women more empathetic than men? Questionnaire and EEG estimations of sex/gender differences in empathic ability. Soc Cognit Affect Neurosci. 2023;18(1).
- Mshana G, Peter E, Malibwa D, Aloyce D, Kapiga S, Stöckl H. Masculinity, power and structural constraints: Men's conceptualization of emotional abuse in Mwanza, Tanzania. Soc Sci Med. 2022;292.
- Clarke HM. #Metoo or #Hertoo? A moderated mediation model of gender differences in perceptions of sexual harassment. Arch Sex Behav. 2022;51(6):3105–20.

- Li S, Yan H, Qiao S, Chang X. Prevalence, influencing factors and adverse consequences of workplace violence against nurses in China: A cross-sectional study. J Nurs Adm Manag. 2022;30(6):1801–10.
- Lindquist B, Feltes M, Niknam K, Koval KW, Ohn H, Newberry J, Strehlow M, Walker R. Experiences of workplace violence among healthcare providers in Myanmar: a cross-sectional survey study. Cureus. 2020.
- Zhu H, Liu X, Yao L, Zhou L, Qin J, Zhu C, Ye Z, Pan H. Workplace violence in primary hospitals and associated risk factors: A cross-sectional study. Nurs Open. 2021;9(1):513–8.
- Jerome-D'Emilia B, Suplee PD, Linz S. Challenges faced by new nurses during the COVID-19 pandemic. J Nurs Scholarsh. 2022;54(6):772–86.
- Alshawush K, Hallett N, Bradbury-Jones C. The impact of transition programmes on workplace bullying, violence, stress and resilience for students and new graduate nurses: A scoping review. J Clin Nurs. 2021;31(17–18):2398–417.
- Bruschini MM, Hediger H, Busch A-K. Patients' sexual harassment of nurses and nursing students: a cross-sectional study. Int J Nurs Stud Adv. 2023;5.
- Christensen SS, Wilson BL, Cummins MR, Eaton J, Iacob E, Hansen SD. Exploring nurses' emotional reactions to and reporting of patient-on-nurse workplace violence: A mixed-methods study. Int J Nurs Stud 2024;153.
- Li L, Zhang Q, Yang H, Undergraduate SL. Incidence and related influencing factors of workplace violence among psychiatric nurses in China: A systematic review and Meta-analysis. Arch Psychiatr Nurs. 2022;40:68–76.
- Nøland ST, Taipale H, Mahmood JI, Tyssen R. Analysis of career stage, gender, and personality and workplace violence in a 20-Year nationwide cohort of physicians in Norway. JAMA Netw Open. 2021;4(6).
- Stafford S, Avsar P, Nugent L, O'Connor T, Moore Z, Patton D, Watson C. What is the impact of patient violence in the emergency department on emergency nurses' intention to leave? J Nurs Adm Manag. 2022;30(6):1852–60.
- 46. Parodi JB, Burgos LM, Garcia-Zamora S, Liblik K, Pulido L, Gupta S, Saldarriaga C, Puente-Barragan AC, Morejón-Barragán P, Alexanderson-Rosas E, et al. Gender differences in workplace violence against physicians and nurses in Latin America: a survey from the Interamerican society of cardiology. Public Health. 2023;225:127–32.
- Kiymaz D, Koç Z. Workplace violence, occupational commitment and intention among emergency room nurses: A mixed-methods study. J Clin Nurs. 2022;32(5–6):764–79.

# **Publisher's note**

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.