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Prevalence and characteristics of intimate partner violence among nurses in tertiary hospitals in China: a national cross-sectional study

Yufan Chen
Second Xiangya Hospital of Central South University
Yusheng Tian
Second Xiangya Hospital of Central South University
Zengyu Chen
University of Washington-Seattle
Meng Ning
Second Xiangya Hospital of Central South University
Jianghao Yuan
Second Xiangya Hospital of Central South University
Xinnan Xie
Boston University
Juan Peng
JuanPeng504121@csu.edu.cn
Second Xiangya Hospital of Central South University
Yamin Li
Hunan Provincial People's Hospital and the First-affiliated Hospital of Hunan Normal University

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Abstract

Background

Intimate partner violence (IPV) is a major global social issue that poses severe threats to both physical and mental health. However, the prevalence and associated factors of IPV among nurses in China remain insufficiently studied. Existing evidence indicates that women are more likely to be victims of IPV. More specifically, as a predominantly female workforce group, nurses may constitute a vulnerable population at risk of IPV. Nevertheless, evidence regarding the prevalence of IPV among nurses working in tertiary hospitals in China remains limited, and the risk factors and correlates of IPV in this population have not been comprehensively examined.

Methods

We conducted a nationwide survey using a self-designed structured questionnaire to collect data on demographics, socioeconomic characteristics, lifestyle and childhood experiences, mental health conditions, burnout, and IPV. Depression, anxiety, and burnout levels were assessed using validated scales. Binary logistic regression was applied to identify factors associated with IPV.

Results

Among 97,867 nurses, the prevalence of IPV in the past year was 7.90%, with emotional violence (7.63%) being the most common subtype. Logistic regression analysis showed that male gender, 31–40 years old, postgraduate degree, partner occupation as a nurse, smoking status (> 1 cigarette/day), alcohol use (> 4 times/week), and adverse childhood experience were significantly associated with IPV. Furthermore, IPV exposure is closely related to the high risk of depression, anxiety, and burnout.

Conclusion

IPV among nurses in China is an important issue associated with population, educational and lifestyle factors. Since it is closely associated with poor mental health outcomes, targeted prevention and intervention strategies should be implemented to protect nurses' well-being, occupational stability, and the quality of medical service.

Introduction

Intimate partner violence (IPV), also known as domestic violence and abuse [1], was defined by the World Health Organization (WHO) in 2020 as behavior within an intimate relationship that causes physical, sexual or psychological harm. According to WHO (2021) estimates, approximately one third of women worldwide have experienced IPV during their lifetime [2]. IPV can result in sustained and severe injury to victims. Physiologically, it can cause organic lesions, such as brain injury [3] and chronic pain [4]. Psychologically, the consequences of IPV include depression, anxiety and post-traumatic stress disorder (PTSD) [5, 6], which usually persist for many years and be accompanied with cognitive impairment [7].

The prevalence of IPV varies substantially among regions, mainly due to social and cultural differences. In Western and central European countries with high gender equality indices, the lifetime prevalence of IPV among women is approximately 20%. In contrast, in regions such as South Asia, where gender equality indices are comparatively lower, prevalence estimates may reach as high as 35% [8]. In certain regions, traditional sociocultural norms may accept violence in intimate relationships. For example, in Jordan, prevailing traditional beliefs emphasizes male authority, and psychological violence against women may be normalized within traditional gender roles. As a result, 47.5% of women suffer from psychological violence from their husbands, who are often regarded as "normal family interaction" [9]. This sociocultural factor encourages the perpetuation of violence and leads to insufficient attention to its harmful consequences and victims in need of help [10].

As frontline health professionals who have frequent contact with patients, nurses are often expected to play a central role in identifying and intervening in IPV cases. However, given that this occupation is predominantly female, nurses may inherently face a higher risk of IPV. Such elevated risk could adversely affect their well-being and professional performance. Previous research has indicated that nurses typically face long working hours, highly acute patient care, and emotional exhaustion [11–13]. Coupled with limited social support, this will further increase the risk of experiencing IPV [14]. However, the research on IPV among nurses is limited. Most existing studies focus on nurses in their professional role with victims of IPV [15, 16], examining aspects such as their knowledge, attitudes, and screening competencies, while few focus on their role as victims. A study conducted among ICU nurses in tertiary hospitals in Yunnan, China, showed that 58.1% of nurses reported having experienced IPV [17]. In the limited research on violence towards medical staff, attention is mainly focused on workplace violence [18, 19], with comparatively little focus on intimate relationships that may profound affect personal life. Besides research focus, most existing studies are constrained by small sample size. At present, there is no systematic nationwide study covering the entire population of tertiary hospital nurses in China.

In view of these gaps, this study aims to systematically investigate IPV among Chinese nurses. Specifically, it aims to examine the prevalence, characteristics, and associated factors of IPV among nurse occupational groups through a large-scale survey and statistical analysis, thereby providing an evidence base to guide targeted intervention strategies and support nurses' well-being.

Methods

Study design and settings

This study adopted a multicenter cross-sectional survey design using baseline data from the Nurses' Mental Health Study (NMHS). Detailed information regarding the NMHS can be found in previously published protocol [20]. The research site covers 67 tertiary hospitals in 31 provincial administrative regions in mainland China. All participating hospitals are large-scale medical institutions that meet the comprehensive diagnosis and treatment standards. All participants provided electronic informed consent, and this study has been ethically approved by the leading institutional ethics committee. All study methods were strictly conducted in line with the guidelines and regulations outlined in the Declaration of Helsinki.

Data collection and participants

Using the method of cluster sampling, the in-service registered nurses in tertiary hospitals (≥ 2000 beds, appropriately relaxed in remote areas) were selected as the research objects. The exclusion criteria included intern nurses and interns. This survey invited a total of 147,832 nurses, with 135,161 online questionnaires returned. Following data cleaning procedures, baseline analysis included questionnaires from 131,713 nurses, yielding an effective response rate of 89.10%. The data cleaning was performed independently by two researchers and consisted of three sequential steps. First, duplicate questionnaires were identified and removed based on matching month of birth, telephone number, and the last four digits of national ID numbers. Second, we excluded participants whose values on any continuous variable were identified as outliers (below P25–3IQR or above P75 + 3IQR). Third, logical consistency checks were applied; questionnaires containing two or more inconsistencies (e.g., reported work experience exceeding the participant's age) were removed. Additionally, 33,846 participants selected "prefer not to answer" on items related to IPV and were consequently excluded from the analysis. After these exclusions, the final analytical sample comprised 97,867 participants.

Measures

A structured online questionnaire developed by the research team was used for this study. This study uses the structured online questionnaire developed by the research team. The survey included four variable categories: (1) demographic and sociological information, (2) lifestyle and childhood experience, (3) mental health and burnout, and (4) IPV exposure. Detailed information of these scales is provided in the supplementary material 1.

Demographic and sociological variables

Self-reported demographic and sociological information was collected, including gender, age, ethnicity, education, marital status, partner's occupation as a nurse (yes/no), current pregnancy status, the number of children, and religion.

Lifestyle and childhood experience

Smoking status was measured using a self-reported item[21]. Participants were asked to indicate their current smoking status: Never smoked; Occasionally smoked (less than 1 cigarette per day); Currently smoking (more than 1 cigarette per day); or Formerly smoked (previously smoked more than one cigarette per day for over one year, now quit smoking).

Alcohol use status in the past year was assessed by a question adapted from the Alcohol Use Disorders Identification Test (AUDIT) [22]. Participants were asked "How often did you drink alcohol in the past year?" with response options including "Never drank", "Once a month or less than once a month", "2–4 times a month", "2–3 times a week", and "4 or more times a week".

Childhood experiences focus on happiness. A single question was used: "Do you think your childhood was happy?" the answer options included "very happy", "happy", "Neutral", "unhappy" and "very unhappy". Participants were asked to choose the option that best described their subjective feelings about childhood happiness.

Mental health

In order to collect mental health data, we chose to use the validated psychometric questionnaire to evaluate the symptoms of depression and anxiety.

Depressive symptoms were measured using the Patient Health Questionnaire-9 (PHQ-9) developed by Kroenke et al. (2001) [23]. This questionnaire is a nine item self rating scale used to assess the severity of depressive symptoms in the past two weeks. The four point Likert scale (0="not at all" to 3="almost every day") is used for the score of each item, and the total score is between 0 and 27. The degree of depression was divided into non depression (0–4), mild depression (5–9), moderate depression (10–14) and severe depression (15–27). In this study, Cronbach's α coefficient was 0.90.

Anxiety symptoms were assessed with the generalized Anxiety Disorder-7 (GAD-7) Scale developed by Spitzer et al. (2006) [24]. This is a seven item self-reported questionnaire to assess the severity of anxiety symptoms in the past two weeks. The four point Likert scale (0="not at all" to 3="almost every day") is used for the score of each item, and the total score is between 0 and 21. The degree of anxiety was divided into no anxiety (0–4), mild anxiety (5–9), moderate anxiety (10–14), and severe anxiety (15–21). For the two scales measuring mental health, the higher the score, the more serious the symptoms. In this study, Cronbach's α coefficient was 0.94.

Job burnout over the past year was measured with a single question: "Did you feel fatigued in the past year?" Response options reflect increasing levels of burnout: no burnout; stress without burnout; early burnout with intermittent symptoms; persistent burnout with frequent work-related frustration; and

severe burnout potentially requiring help. Responses indicating burnout were classified as positive burnout (scores ≥ 3).

Intimate Partner Violence (IPV)

IPV exposure in the past year was measured by three self-reported questions adapted from the validated Chinese version of the Abuse Assessment Scale (AAS) [25]. The scale comprehensively reflects the different dimensions of IPV, and the selected items are consistent with its standardization framework to ensure the effectiveness of measurement. The scale assessed three forms of violence: physical violence (PV), emotional violence (EV), and sexual violence (SV).

Each item was scored on a four-point Likert scale (0 = Never, 1 = Once, 2 = 2–3 times, 3 = More than 3 times), with an additional option for "Prefer not to answer". The score of each item directly represents the exposure level to the corresponding violence type, which higher score indicates greater frequency of that corresponding type of violence. IPV prevalence was calculated based on frequency distribution and binary coded IPV results (yes/no).

Statistical analyses

Descriptive statistics, including frequency and percentage, are used to summarize demographic and occupational characteristics.

The analysis strategy is divided into three steps:

First, descriptive classification was performed. Four IPV indicators were evaluated: (1) the overall prevalence of various types of IPV; (2) the prevalence of three types of personal IPV (emotional, physical and sexual violence); (3) the prevalence of IPV co-occurrence pairs; (4) the prevalence of three subtypes of IPV occur simultaneously.

Second, prevalence and associated demographic factors were analyzed. Before propensity score matching, group differences in categorical variables were examined using Chi-square tests, and differences in continuous variables were evaluated using independent samples t-tests. Binary logistic regression was conducted to identify the demographic predictors of each IPV subtype.

Third, to examine the associations between IPV and psychological distress indicators (including depressive symptoms, anxiety symptoms, and burnout) while reducing selection bias, we further performed propensity score matching (PSM) prior to logistic regression analysis. All baseline covariates that differed significantly between the IPV and non-IPV groups before matching were included. A 1:1 nearest-neighbor matching algorithm without replacement was used, with a caliper width equal to 0.2 standard deviations of the propensity score. The balance of baseline characteristics between groups was evaluated using standardized mean differences (SMD), with an SMD < 0.1 considered indicative of adequate balance. PSM was implemented using the “MatchIt” package in R (version 4.4.1). Subsequent logistic regression analyses were then conducted to explore the relationships between IPV and psychological distress.

All statistical analyses were performed using IBM SPSS Statistics version 27.0.

Results

Participant characteristics

A total of 97,867 nurses were included in the analysis. The majority of participants were female (93.8%), with a mean age of 35.2 ± 7.0 years (range: 18–65 years), among which 25.5% were younger than 30 years old. In terms of ethnicity, 93.0% were Han, while 7.0% belonged to other ethnic groups.

Prevalence and characteristics of IPV

The overall prevalence of IPV was 7.90% (n = 7,735), as shown in Fig. 1. The majority of reported IPV incidents involved a single type of violence.

Among the three IPV subtypes, emotional violence had the highest prevalence at 7.63%, far exceeding the rate of physical violence (1.43%) and sexual violence (0.59%). Regarding combinations of violence types, the co-occurrence of physical and emotional violence was the most prevalent (1.21%), followed by emotional-sexual (0.54%) and physical-sexual (0.39%) combinations. Simultaneous occurrence of all three subtypes of violence was relatively rare (0.39%).

Differences in Demographic and sociological factors in IPV prevalence

Table 1 presents detailed distributions of IPV across demographic and sociological variables. Differences between groups were analyzed using the Pearson chi-square test.

Table 1
Demographic Characteristics Across Different Types of Violence

	Physical violence		Emotional violence		Sexual violence		IPV	
	yes	no	yes	no	yes	no	yes	no
Gender								
Female(91797)	1132(1.23)	90665(98.77)	6726(7.33)	85071(92.67)	444(0.48)	91353(99.52)	6944(7.56)	84853(92.44)
Male(6070)	267(4.40)	5803(95.60)	745(12.27)	5325(87.73)	135(2.22)	5935(97.78)	791(13.03)	5279(86.97)
χ2	402.65		196.86		290.27		233.01	
P value	< .001		< .001		< .001		< .001	
Age								
≤ 30(25001)	371(1.48)	24630(98.52)	1735(6.94)	23266(93.06)	146(0.58)	24855(99.42)	1811(7.24)	23190(92.76)
31–40(53383)	836(1.57)	52547(98.43)	4400(8.24)	48983(91.76)	345(0.65)	53038(99.35)	4550(8.52)	48833(91.48)
41–50(15646)	159(1.02)	15487(98.98)	1128(7.21)	14518(92.79)	69(0.44)	15577(99.56)	1156(7.39)	14490(92.61)
≥ 51(3833)	33(0.86)	3800(99.14)	208(5.43)	3625(94.57)	19(0.50)	3814(99.50)	218(5.69)	3615(94.31)
χ2	35.35		75.59		9.37		74.69	
P value	< .001		< .001		0.025		< .001	
Education								
Below Bachelor's degree(6292)	92(1.46)	6210(98.54)	401(6.36)	5901(93.64)	38(0.60)	6264(99.40)	422(6.70)	5880(93.90)
Undergraduate(87044)	1240(1.42)	85804(98.58)	6659(7.65)	80385(92.35)	513(0.59)	86531(99.41)	6887(7.91)	80157(92.09)
Postgraduate(4521)	67(1.48)	4454(98.52)	411(9.09)	4110(90.91)	28(0.62)	4493(99.38)	426(9.42)	4095(90.58)
χ2	0.15		28.08		0.080		26.96	
P value	0.930		< .001		0.961		< .001	
Partner's occupation as a nurse								
No(70325)	886(1.26)	69439(98.74)	5155(7.33)	65170(92.67)	365(0.52)	69960(99.48)	5331(7.58)	64994(92.42)
Yes(13297)	255(1.92)	13042(98.08)	1181(8.88)	12116(91.12)	116(0.87)	13181(99.13)	1221(9.18)	12076(90.82)
χ2	35.47		38.22		23.80		39.52	
P value	< .001		< .001		< .001		< .001	
Pregnancy								
No(88317)	1107(1.25)	87210(98.75)	6566(7.43)	81751(92.57)	432(0.49)	87885(99.51)	6775(7.67)	81542(92.33)
Yes(348)	25(0.72)	3455(99.28)	160(4.60)	3320(95.40)	12(0.34)	3468(99.66)	169(4.86)	3311(95.14)
χ2	7.44		39.27		1.16		37.54	
P value	0.006		< .001		0.281		< .001	
Number of children								
0(22650)	323(1.43)	22327(98.57)	1522(6.72)	21128(93.28)	122(0.54)	22528(99.46)	271(1.20)	22379(98.80)
1(48878)	633(1.30)	48245(98.70)	3569(7.30)	45309(92.70)	267(0.55)	48611(99.45)	539(1.10)	48339(98.90)
≥ 2(26339)	443(1.68)	25896(98.32)	2380(9.04)	23959(90.96)	190(0.72)	26149(99.28)	377(1.43)	25962(98.57)
χ2	18.18		107.93		10.33		110.78	
P value	< .001		< .001		0.006		< .001	
Smoking status								
Never(93733)	1193(1.27)	92540(98.73)	6806(7.26)	86927(92.74)	465(0.50)	93268(99.50)	7036(7.51)	86697(92.49)
now < 1 cigarette /day(2198)	102(4.64)	2096(95.36)	351(15.97)	1847(84.03)	54(2.46)	2144(97.54)	368(16.74)	1830(83.26)

Note: The Pearson chi-square test was used to compare demographic characteristics between participants with and without each type of violence.

	Physical violence		Emotional violence		Sexual violence		IPV	
	yes	no	yes	no	yes	no	yes	no
now > 1 cigarette /day(1561)	89(5.70)	1472(94.30)	258(16.53)	1303(83.47)	49(3.14)	1512(96.86)	275(17.62)	1286(82.38)
Used to(375)	15(4.00)	360(96.00)	56(14.93)	319(85.07)	11(2.93)	364(97.07)	56(14.93)	319(85.07)
χ2	396.95		438.51		351.76		484.02	
P value	< .001		< .001		< .001		< .001	
Alcohol use status								
Never(56102)	594(1.06)	55508(98.94)	3263(5.82)	52839(94.18)	253(0.45)	55849(99.55)	3388(6.04)	52714(93.96)
1 time/month or less(35759)	630(1.76)	35129(98.24)	3441(9.62)	32318(90.38)	239(0.67)	35520(99.33)	3547(9.92)	32212(90.08)
2–4 times/month(4844)	127(2.62)	4717(97.38)	593(12.24)	4251(87.76)	64(1.32)	4780(98.68)	620(12.80)	4224(87.20)
2–3 times/week(756)	33(4.37)	723(95.63)	110(14.55)	646(85.45)	15(1.98)	741(98.02)	115(15.21)	641(84.79)
4 times/week or more(406)	15(3.69)	391(96.31)	64(15.76)	342(84.24)	8(1.97)	398(98.03)	65(16.01)	341(83.99)
χ2	192.63		698.71		104.35		719.18	
P value	< .001		< .001		< .001		< .001	
Childhood experience								
Very good(28463)	212(0.74)	28251(99.26)	991(3.48)	27472(96.52)	108(0.38)	28355(99.62)	1035(3.64)	27428(96.36)
Good(39668)	459(1.16)	39209(98.84)	2658(6.70)	37010(93.30)	174(0.44)	39494(99.56)	2759(6.96)	36909(93.04)
Neutral(25224)	556(2.20)	24668(97.80)	2954(11.71)	22270(88.29)	228(0.90)	24996(99.10)	3051(12.10)	22173(87.90)
Bad(3829)	133(3.47)	3696(96.53)	735(19.20)	3094(80.80)	49(1.28)	3780(98.72)	753(19.67)	3076(80.33)
Very bad(683)	39(5.71)	644(94.29)	133(19.47)	550(80.53)	20(2.93)	663(97.07)	137(20.06)	546(79.94)
χ2	425.38		2201.29		173.63		2236.44	
P value	< .001		< .001		< .001		< .001	

Note: The Pearson chi-square test was used to compare demographic characteristics between participants with and without each type of violence.

The prevalence of IPV was 13.03% among male nurses and 7.56% among female nurses. Specifically, male nurses reported significantly higher prevalence of all three forms of violence than female nurses: physical (4.40% vs. 1.23%), emotional (12.27% vs. 7.33%), and sexual (2.22% vs. 0.48%).

IPV prevalence was highest among nurses aged 31–40 years (8.52%). The prevalence of single-type violence \ (1.57%), emotional violence (8.24%), and sexual violence (0.65%) were also highest in this age group. IPV prevalence also increased with higher education level: postgraduate nurses had the highest prevalence (9.42%), followed by undergraduate nurses (7.91%). Nurses categorized as “undergraduate and below” had the lowest prevalence (6.70%). Compared with the childless nurses, IPV prevalence was higher among nurses with more than two children (1.43%). Similarly, participants with a nurse partner had a higher prevalence of IPV compared with those whose partners were not nurses (9.18% vs. 7.58%). In contrast, IPV prevalence was lower among pregnant nurses (4.86%) compared to non-pregnant nurses (7.67%).

Lifestyle factors were also significantly associated with IPV prevalence. The IPV prevalence was lowest among non-smokers (7.51%) and significantly increased among smokers (< 1 cigarette/day: 16.74%; >1 cigarette/day: 17.62%). The prevalence of IPV was lowest among those reporting no alcohol use (6.04%) and increased with drinking frequency, peaking among individuals who consumed alcohol four or more times per week (16.01%). Based on self-reported childhood socioeconomic status, IPV prevalence was highest among nurses reported "very bad" childhood conditions (20.06%) and lowest among those reported "very good" conditions (3.64%). These results highlight the significant differences of IPV exposure across demographic, sociological, and lifestyle characteristics, with standardized mean difference between 0.027 and 0.161.

PSM——Propensity score matching (PSM) analysis

To further examine the relationship between IPV and associated factors, Propensity Score Matching (PSM) was performed, with the IPV group treated as the exposed group and the non-IPV group as the control group.

After excluding unmatched cases, the total sample size for analysis was reduced to 15,466 participants (IPV group = 7,733, non-IPV group = 7,733). The discrepancy in sample size between the two groups may be due to the fact that under the conditions of "1:1 nearest neighbor matching with a caliper of 0.2 standard deviations and without replacement," unmatched cases were excluded from subsequent analysis, and only successfully matched samples were retained. During the matching process, two individuals from the IPV group were excluded because no suitable matches could be found, resulting in

a slight reduction in the sample size of the IPV group after matching. Covariates were successfully balanced between groups, with all standardized mean differences less than 0.1 and non-significant p-values (p > 0.05). The results of PSM analysis are presented in Table 2.

Table 2
Comparison of General Demographic Data between IPV Group and Non-IPV Group Before and After PSM

Demographic variables	Before propensity score matching				After propensity score matching			
	Non-IPV group	IPV group	SMD	P value	Non-IPV group	IPV group	SMD	P value
Total number	90132	7735			7,733	7733		
n	90132	7735			7,733	7733		
Gender								
Female	84853(94.14)	6944(89.77)	0.161	< 0.001	6,945	6944	< 0.001	1.000
Male	5279(5.86)	791(10.23)			788	789		
Age								
≤ 30	23192(25.73)	1811(23.41)	0.105	< 0.001	1,809	1811	0.002	1.000
31–40	48835(54.18)	4550(58.82)			4,551	4549		
41–50	14490(16.08)	1156(14.95)			1,153	1155		
≥ 51	3615(4.01)	218(2.82)			220	218		
Ethnity								
Han	83873(93.06)	7135 (92.24)	0.031	0.008	7,137	7133	0.002	0.928
Other	6259(6.94)	600(7.76)			596	600		
Education								
Below Bachelor's degree	5880(6.52)	422(5.46)	0.061	< 0.001	419	422	0.002	0.992
Undergraduate	80157(88.93)	6887(89.04)			6886	6885		
Postgraduate	4095(4.54)	426(5.51)			428	426		
Marital status								
Unmarried	12074(13.40)	1032(13.34)	0.079	< 0.001	1,036	1032	0.009	0.989
Married	76872(85.29)	6521(84.31)			6,519	6521		
Divorced	939(1.04)	147(1.90)			148	146		
Remarried	198(0.22)	31(0.40)			26	30		
Widowed	49(0.05)	4(0.05)			4	4		
Religion								
No	87810(97.42)	7427(96.02)	0.079	< 0.001	7,427	7427	< 0.001	1.000
Yes	2322(2.58)	308(3.98)			306	306		

Factors associated with IPV

Table 3 summarizes the binary logistic regression analysis results of three IPV subtypes. In terms of demographic characteristics, gender differences were particularly prominent: female nurses had significantly higher risk of experiencing physical violence (OR = 1.988, 95%CI: 1.628–2.422) and sexual violence (OR = 2.383, 95%CI: 1.782–3.168). Age analysis showed that compared with nurses under 30 years old, 41–50 years had a significantly lower risk of physical violence (OR = 0.717, 95%CI: 0.567–0.904), while other age groups showed no statistically significant differences. Marital status presented different patterns, with divorce being significantly associated with an increased risk of physical violence (OR = 2.441, 95%CI: 1.621–3.620).

Table 3
Binary Logistic Regression Analysis of IPV Subtypes

Variable name	Physical violence		Emotional violence		Sexual violence	
	OR	95% CI	OR	95% CI	OR	95% CI
Gender						
Male	1.000	reference	1.000	reference	1.000	reference
Female	1.988***	(1.628, 2.422)	0.889	(0.778, 1.015)	2.383***	(1.782, 3.168)
Age						
≤ 30	1.000	reference	1.000	reference	1.000	reference
31–40	0.937	(0.788, 1.117)	0.988	(0.891, 1.094)	0.971	(0.747, 1.273)
41–50	0.717**	(0.567, 0.904)	1.000	(0.880, 1.137)	0.822	(0.577, 1.169)
≥ 51	0.776	(0.514, 1.139)	0.919	(0.743, 1.136)	1.263	(0.721, 2.111)
Ethnity						
Han	1.000	reference	1.000	reference	1.000	reference
Other	1.002	(0.812, 1.224)	0.988	(0.877, 1.113)	1.398*	(1.056, 1.821)
Marital status						
Unmarried	1.000	reference	1.000	reference	1.000	reference
Married	1.162	(0.899, 1.496)	1.032	(0.885, 1.202)	1.015	(0.672, 1.514)
Divorced	2.441***	(1.621, 3.620)	1.038	(0.790, 1.364)	1.445	(0.714, 2.748)
Remarried	2.142	(0.897, 4.535)	1.268	(0.730, 2.220)	0.893	(0.139, 3.179)
Widowed	0.000	(NA, 12.169)	2.08	(0.403, 15.097)	0.000	(NA, 42115.077)
Religion						
No	1.000	reference	1.000	reference	1.000	reference
Yes	1.204	(0.909, 1.570)	1.076	(0.910, 1.271)	1.446*	(0.987, 2.055)
Smoking status						
Never	1.000	reference	1.000	reference	1.000	reference
now < 1/day	1.351*	(1.061, 1.705)	1.003	(0.857, 1.174)	1.799***	(1.288, 2.474)
now > 1/day	1.239	(0.933, 1.632)	1.02	(0.837, 1.243)	1.602*	(1.090, 2.327)
Used to	1.261	(0.687, 2.167)	1.348	(0.905, 2.018)	2.277*	(1.111, 4.249)
Alcohol use status						
Never	1.000	reference	1.000	reference	1.000	reference
1 time/month or less	0.895	(0.792, 1.012)	1.009	(0.943, 1.080)	0.756**	(0.625, 0.913)
2–4 times/month	0.848	(0.679, 1.053)	1.032	(0.907, 1.173)	0.883	(0.642, 1.198)
2–3 times/week	1.298	(0.855, 1.915)	1.273	(0.958, 1.696)	1.091	(0.592, 1.878)
4 times/week or more	0.990	(0.542, 1.687)	1.244	(0.863, 1.798)	0.993	(0.432, 1.987)
Child experience						
Very good	1.000	reference	1.000	reference	1.000	reference
Good	0.788	(0.664, 0.938)	0.992	(0.896, 1.098)	0.598	(0.468, 0.768)
Neutral	0.863**	(0.730, 1.023)	0.999	(0.904, 1.105)	0.710***	(0.562, 0.903)
Bad	0.857	(0.679, 1.077)	1.006	(0.880, 1.149)	0.652**	(0.457, 0.918)
Very bad	1.361	(0.926, 1.955)	0.970	(0.754, 1.247)	1.370*	(0.805, 2.223)

Note. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Lifestyle factors highlighted the significant impact of smoking behavior. Current light smokers (< 1 cigarette a day) had an increased risk of physical violence (OR = 1.351, 95%CI: 1.061–1.705) and sexual violence (OR = 1.799, 95%CI: 1.288–2.474). Alcohol use appeared protective in some cases, where using alcohol once a month or less was associated with a lower risk of sexual violence (OR = 0.756, 95%CI: 0.625–0.913).

Finally, childhood experience remained a strong predictor: nurses who reported “good” childhood had a significantly reduced risk of physical violence (OR = 0.788, 95%CI: 0.664–0.938) and sexual violence (OR = 0.598, 95%CI: 0.468–0.768), while those with a “normal” childhood also had a protective effect against sexual violence (OR = 0.710, 95%CI: 0.562–0.903).

Prevalence of depressive symptoms, anxiety symptoms and burnout

Table 4 presents pre- and post-matching results. Before matching, the prevalence of depressive symptoms, anxiety symptoms, and burnout among nurses were 53.00%, 37.68%, and 44.12%, respectively. After PSM, among 15,464 participants, prevalence increased to 65.44% for depressive symptoms, 51.02% for anxiety symptoms, and 53.86% for burnout.

Table 4
Prevalence of depression, anxiety and burnout

	Before propensity score matching		After propensity score matching	
	IPV group	**Non-IPV group**	**IPV group**	**Non-IPV group**
Anxiety Symptom				
GAD score > 4	4996(64.6)	31883(35.4)	4993(64.6)	2898(37.5)
No anxiety	2739(35.4)	58249(64.6)	2739(35.4)	4834(62.5)
Mild anxiety	3932(50.8)	27650(30.7)	3930(50.8)	2497(32.3)
Moderate anxiety	758(9.8)	3106(3.4)	757(9.8)	296(3.8)
Severe anxiety	306(4.0)	1127(1.3)	306(4.0)	105(1.4)
Depressive Symptom				
PHQ score > 4	6101(78.9)	45764(50.8)	6098(78.9)	4023(52.0)
No depression	1634(21.1)	44368(49.2)	1634(21.1)	3709(48.0)
Mild depression	3955(51.1)	36232(40.2)	3954(51.1)	3148(40.7)
Moderate depression	1343(17.4)	6686(7.4)	1343(17.4)	597(7.7)
Moderately severe depression	569(7.4)	2136(2.4)	567(7.3)	201(2.6)
Severe depression	234(3.0)	710(0.8)	234(3.0)	77(1.0)
Burnout Symptom				
Burnout score ≥ 3	4881(63.1)	38297(42.5)	4880(63.1)	3450(44.6)

Association between IPV and depressive symptoms, anxiety symptoms, and burnout

As shown in Table 5, nurses who experienced IPV were at significantly higher risk of developing depressive symptoms, anxiety symptoms, and burnout. There was a positive correlation between IPV categories and symptom reporting rates: for depressive symptoms (physical violence: OR = 1.765 [95% CI: 1.334–2.352]; emotional violence: OR = 3.695 [95% CI:3.481–3.923]; sexual violence: OR = 3.422 [95% CI: 2.817–4.187]); anxiety symptoms (physical violence: OR = 1.765 [95% CI: 1.334–2.352]; emotional violence: OR = 3.695 [95% CI: 3.481–3.923]; sexual violence: OR = 3.422 [95% CI:2.817–4.187]); and burnout (physical violence: OR = 1.438 [95% CI: 1.097, 1.887]; emotional violence: OR = 2.304 [95% CI: 2.191, 2.424]; sexual violence: OR = 2.414 [95% CI: 2.037, 2.870]).

Table 5
Presents the binary logistic regression analysis of depression, anxiety and burnout symptoms among nurses

Variable name	Depressive symptoms		Anxiety symptoms		Burnout symptom	
	OR	95% CI	OR	95% CI	OR	95% CI
Gender						
Male	1	reference	1	reference	1	reference
Female	1.051	(0.995, 1.109)	1.051	(0.995, 1.109)	0.961	(0.911, 1.014)
Age						
≤ 30	1	reference	1	reference	1	reference
31–40	1.279***	(1.234, 1.327)	1.279***	(1.234, 1.327)	1.225***	(1.181, 1.270)
41–50	1.171***	(1.118, 1.226)	1.171***	(1.118, 1.226)	1.12***	(1.07, 1.173)
≥ 51	0.862***	(0.801, 0.928)	0.862***	(0.801, 0.928)	0.925*	(0.859, 0.996)
Ethnity						
Han	1	reference	1	reference	1	reference
Other	1.029	(0.979, 1.083)	1.029	(0.979, 1.083)	1.012	(0.962, 1.064)
Education						
Below Bachelor's degree	1	reference	1	reference	1	reference
Undergraduate	1.075**	(1.019, 1.133)	1.075**	(1.019, 1.133)	1.09**	(1.033, 1.15)
Postgraduate	0.882**	(0.815, 0.954)	0.882**	(0.815, 0.954)	1.153***	(1.066, 1.248)
Marry						
Unmarried	1	reference	1	reference	1	reference
Married	0.852***	(0.814, 0.892)	0.852***	(0.814, 0.892)	0.904***	(0.864, 0.946)
Divorced	1.157*	(1.013, 1.322)	1.157*	(1.013, 1.322)	1.064	(0.936, 1.211)
Remarried	1.043	(0.795, 1.374)	1.043	(0.795, 1.374)	0.861	(0.658, 1.125)
Widowed	0.949	(0.544, 1.667)	0.949	(0.544, 1.667)	0.694	(0.385, 1.217)
Religion						
No	1	reference	1	reference	1	reference
Yes	1.264***	(1.166, 1.371)	1.264***	(1.166, 1.371)	1.235***	(1.141, 1.336)
IPV						
No	1	reference	1	reference	1	reference
Physical violence	1.765***	(1.334, 2.352)	1.765***	(1.334, 2.352)	1.438**	(1.097, 1.887)
Emotional violence	3.695***	(3.481, 3.923)	3.695***	(3.481, 3.923)	2.304***	(2.191, 2.424)
Sexual violence	3.422***	(2.817, 4.187)	3.422***	(2.817, 4.187)	2.414***	(2.037, 2.870)

Note. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Discussion

This nationwide multicenter study investigates IPV among tertiary hospital nurses in China, focusing on prevalence, subtypes, associated factors, and links to mental health outcomes. The past-year IPV prevalence was 7.90%, with emotional violence (7.63%) being the predominant subtype. High-risk groups included nurses with postgraduate degree, male gender, aged 31–40 years, with religious affiliation, unhealthy lifestyle behaviors, and adverse childhood experiences. IPV was strongly associated with mental health issues: 60.25% of participants reported depressive symptoms, 49.33% reported anxiety symptoms, and 48.21% reported burnout, with higher IPV exposure corresponding to higher levels of psychological distress.

Our findings indicate that the past-year prevalence of IPV among nurses in mainland China (7.9%) is significantly lower than the past-year prevalence reported among 11,419 Australian nurses (20%) [26] and the lifetime prevalence of 58.1% among 191 Chinese ICU nurses [17]. The results further suggest that IPV among Chinese nurses most often occurs in a single form, with emotional violence (7.63%) far more common than physical violence (1.43%) or sexual violence (0.59%). Co-occurrence of emotional and physical violence (1.21%) was the most frequent combination, which is more than

emotional-sexual violence (0.54%) and physical-sexual violence (0.39%). Triple exposure (emotional, physical, and sexual) accounted for only 0.39%. Similar patterns have been reported elsewhere: a study on women in Mumbai found that 19% of women experienced emotional violence in the past year, compared with 13% physical and 4% sexual [27]. In China, a cross-sectional study reported a past-year emotional violence prevalence of 22.7% among 843 interviewed nurses, again far exceeding physical (3.3%) and sexual violence (1.2%) [12]. Another study of 522 female nurses in Chinese public hospitals showed that all nurses who had experienced sexual violence also experienced emotional violence [28]. These findings jointly support the following view: emotional violence is the most common form of IPV, and may become the entry point for the escalation of violence. The low prevalence of IPV in this study may be attributed to the use of an online electronic questionnaire for data collection.

In addition, it may also be related to cultural stigma. Chinese traditional norms emphasize family harmony and do not encourage public disclosure of family conflicts. The belief that "family stigma should not be made public" [10] strengthens the stigma of IPV. Because of the fear of social judgment on marriage failure or family humiliation, victims may internalize their pain and avoid disclosure, thus continuing the "culture of silence". Considering this social background, in order to protect the privacy of participants, the questionnaire design includes the "non response tendency" to sensitive items. A total of 33,846 participants refused to answer questions related to IPV. Such a high non response rate (25.7%) is likely to reflect the impact of stigma, which shows that many participants avoid disclosure not because they lack IPV experience, but because they are worried about the potential consequences of acknowledging these experiences. Although this choice respects the autonomy of participants, it may strengthen IPV as a social taboo and help to underestimate its true prevalence. In contrast, high-income Nordic countries generally have higher disclosure rates, where gender equality norms are stronger and stigma is weaker [29].

In addition, the heterogeneity of research tools is another important factor affecting the estimation of prevalence. Studies differ in the operational definition of IPV, measurement dimensions (e.g., whether psychological violence or economic control is included) and assessment time frame (lifetime or past year prevalence). This method difference directly affects the calculation of prevalence [8, 30, 31]. This study paid special attention to the IPV experience of nurses in tertiary hospitals in the past 12 months, so the individuals who were exposed to IPV earlier but not recently were excluded. This restriction may introduce sample selection bias and yield estimates, reflecting relatively low short-term exposure. Occupational characteristics and training experience can also explain the low prevalence in our sample. Compared with the general population, nurses in tertiary hospitals may know more about IPV, receive better training to identify abusive behaviors, and have more motivation to leave abusive relationships.

The total prevalence of IPV in male nurses (13.03%) was significantly higher than that in female nurses (7.56%). This result is in contrast to most international studies in which female participants usually report higher IPV rates. For example, the study of professionals in Spanish public service institutions found that the prevalence of IPV in women (33.8%) was significantly higher than that in men (2.7%) [32]. Nevertheless, some studies have reported higher prevalence of IPV among men. These inconsistencies may be partly due to differences in research design, especially whether the survey focuses on lifetime IPV or IPV in the past 12 months. In an Australian survey of 10674 women and 772 men (including nurses, midwives and nurses), the lifetime prevalence of IPV in men (35%) was significantly lower than that in women (45.1%); However, in the past year, the prevalence of IPV in men (24%) was slightly higher than that in women (22.1%) [26].

The prevalence of IPV in nurses aged 31–40 was the highest, which was significantly higher than that in nurses aged under 30, 41–50 and over 50. This model is consistent with the cross-sectional study of Chinese women [33]. At this stage of life, shift work often hinders their ability to fulfill family responsibilities and leads to "work family conflict" [34, 35]. At this stage, changes in the economic environment and power dynamics in the relationship may increase the possibility of conflict. Therefore, the resulting emotional exhaustion reduces the ability of nurses to deal with violence in intimate relationships.

The prevalence of IPV in highly educated nurses was higher than that in nurses with a postgraduate degree and below bachelor's degree. In addition, nurses whose partners are also nurses are more prone to IPV than nurses whose spouses work outside the nursing profession. This phenomenon may be related to the multiple requirements of tertiary hospitals for highly educated nurses, who are often responsible for clinical work in addition to research and teaching. Publishing pressure and research assessment pressure may spread to family life and conflict with partners. In addition, highly educated women may challenge the self-esteem of male partners through their professional achievements [36, 37], and are expected to perform the dual roles of "good wife and good mother" and "professional elite", thus increasing family pressure.

Marital status also plays a role. Divorced and remarried nurses are more likely to experience IPV than unmarried, married or widowed nurses [38, 39]. As unresolved conflicts in previous relationships and unstable power dynamics in the new partnership are more likely, these individuals may face higher IPV risks. In contrast, pregnancy seems to be a protective factor against IPV, probably because pregnant women get more support from relatives and friends, and potential abusers may reduce violence to cope with social expectations and pressures.

Cigarette smoking and alcohol consumption are associated with an elevated risk of intimate partner violence The incidence of IPV in nurses who smoked at least one cigarette a day (17.62%) or drank more than four times a week (16.01%) was significantly higher than that in the control group ($p < 0.05$). Logistic regression analysis further revealed the close relationship between smoking and physical and sexual violence. The potential mechanism may be that substance use behaviors such as smoking and drinking can be used as coping strategies for violence related stress [40]. These behaviors can provide temporary physical pleasure and reduce negative emotions, thus helping individuals manage the stress associated with abusive relationships. Evidence from the sample of couples in the American community supports this mechanism, individuals who use alcohol in the first 4 hours are more vulnerable to verbal and physical attacks [41].

Our results confirm that IPV is closely related to negative experiences in childhood. The prevalence of IPV among nurses with "very bad" experience was 20.06%, which was 5.5 times that of nurses with "very good" experience (3.64%). The protective effect on sexual violence was the strongest (OR = 0.598). A 24-year longitudinal study tracking adolescents further confirmed that adverse experiences in childhood from 13 to 19 years old increased the risk of IPV victimization in adulthood [42], supporting the strong correlation between early adversity and adult IPV. Childhood is a critical period for the formation of cognitive and behavioral patterns. Traumatic experiences in violent environments may subconsciously reshape the cognitive framework of the intimate relationship of victims. Therefore, in interpersonal relationships, aggressive behavior may be regarded as "normal", making individuals more vulnerable to IPV in later life [43].

IPV was positively correlated with nurses' mental health results, which was consistent with previous research results [44–46]. Among nurses with IPV experience, the prevalence of depression, anxiety and burnout were 65.44%, 51.02% and 53.86%, respectively. White et al. (2024) [31] reported that the incidence of depressive symptoms of female IPV victims was 1.87 times higher than that of men. This difference may be attributed to the dual pressure faced by women in the field of family and occupation. Similarly, a meta-analysis by Spencer et al. (2019) [47]showed that there was a significant correlation between IPV victimization and depression, anxiety and PTSD, emphasizing how traumatic experience exacerbated emotional exhaustion in the occupational environment. In the nursing population, high occupational stress load may interact with IPV to produce a superimposed effect. Oram et al. (2022) [48] proposed that the combined effects of IPV and burnout reduce resilience through the "dual stress model", leading to impaired emotional regulation and reduced self-efficacy.

In addition, mental health problems themselves may be a risk factor for IPV. For example, anxiety symptoms may lead to excessive arousal and catastrophic thinking patterns, which will amplify the perception of conflict and may trigger the partner's control behavior. Importantly, the relationship between IPV and mental health is bidirectional and dose-dependent. The data of this study showed that compared with unexposed nurses, nurses exposed to a single form of IPV had a 2.3-fold higher risk of depressive symptoms, while nurses exposed to multiple forms of IPV had a 4.1-fold higher risk of depressive symptoms.

Limitations

This study has several limitations. First, this study only shows the association with IPV and related factors, which is not enough to provide strong evidence consistent with a causal association. The dynamic mechanism behind these relationships should be further explored through longitudinal cohort studies in the future. Second, data collection relies on participants' retrospective reports on IPV experiences in the past 12 months, which may be affected by recall bias and may lead to underreporting or misreporting of violent events. For emotional violence and sexual violence, the accuracy of subjective memories is particularly limited, and this violence are often hidden. At the same time, the stigma associated with IPV and the reliance on self-reported data may further hinder the full disclosure of actuarial experience. Third, the survey tools are based on the respondents' subjective understanding of IPV and lack of objective evaluation methods. Therefore, some dimensions of violence, such as economic control and digital monitoring, have not been captured, which may limit the comprehensiveness of IPV measurement in this study.

Conclusions

Research shows that nurses aged 31–40, with a postgraduate degree, whose partner is also a nurse, who smoke (> 1 cigarette/day), consume alcohol (> 4 times/week), and report an unhappy childhood experience are more likely to experience IPV. These people also show higher levels of depression, anxiety and burnout, which will seriously damage personal well-being and professional function. These findings highlight the need for special attention and targeted intervention strategies to address these differences. The health department should formulate and implement IPV prevention measures to protect the rights and interests of nurses and ensure the stability and quality of medical services.

Declarations

Human ethics and consent to participate

This study was approved by the ethics committee of national clinical research center in the second Xiangya Hospital, China ((Ethical approval number: LYF20230048). Participants gave informed consent to participate in the study before taking part. All study methods were strictly conducted in line with the guidelines and regulations outlined in the Declaration of Helsinki.

Consent for publication

Not Applicable.

Competing interests

The authors declare no competing interest.

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Author Contribution

All authors were involved in reviewing the subsequent drafts and have given their approval to the final version of the manuscript for publication. CZY PJ and TYS assisted in collecting data from each participating center; NM led the development of the study design; CYF analyzed and interpreted the data, and also drafted the initial version of the manuscript; YJH, LYM and XXN helped refine the details of the writing; TYS took charge of the supervision, validation, and critical revision of the manuscript.

Data availability

No datasets were generated or analyzed during the current study.

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Figures

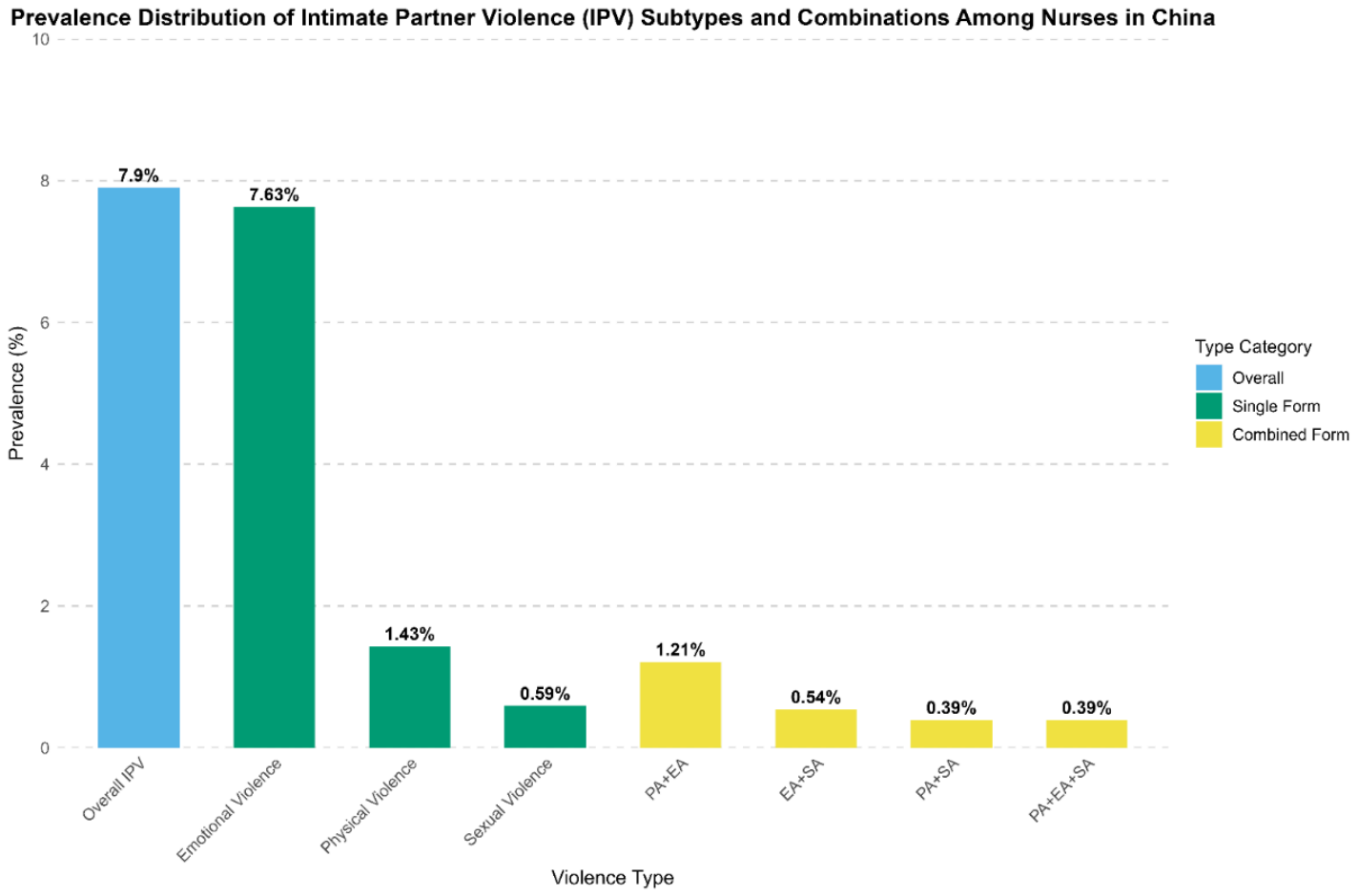


Figure 1

Prevalence Distribution of Intimate Partner Violence (IPV) Subtypes and Combinations Among Nurses in China

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