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Association of Workplace Bullying with Suicide Ideation and Attempt Among Chinese Nurses During the COVID-19 Pandemic

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Abstract

Nurses experience a high incidence of workplace bullying and are at a higher risk of suicide than the general population. However, there is no empirical evidence on how exposure to workplace bullying is associated with suicide ideation and attempts among nurses. Nurses were recruited from tertiary hospitals in Shandong Province, China, using stratified cluster sampling. Suicide ideation and attempts were assessed using two items, and the Workplace Psychologically Violent Behaviors Instrument was used to measure subtypes of workplace bullying. The prevalence of workplace bullying, suicide ideation, and suicide attempts was 30.6%, 16.8%, and 10.8%, respectively. After adjusting for covariates, victims of workplace bullying were at a high risk of suicide ideation and attempts. Among workplace bullying subtypes, individuals' isolation from work and direct negative behaviors were predictors of both suicide ideation and attempts; attack on personality only predicted suicide attempts. The more bullying subtypes experienced by nurses, the greater their likelihood of suicide ideation and attempts. These findings suggested that workplace bullying was associated with an increased risk of suicide ideation and attempts in nurses, with both independent and cumulative risks. Interventions should focus on prevention and managing the effects of workplace bullying among nurses.

Keywords Workplace bullying · Suicide ideation · Suicide attempt · Tertiary hospital · Bullying in nurses

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Introduction

The COVID-19 outbreak at the end of 2019 was a huge challenge and threat for the entire healthcare industry. Nurses, in particular, were exposed to unprecedented stress and risk in the fight against COVID-19 as they spent the most time in direct contact with patients infected with COVID-19 (Lai et al., 2020). According to the International Council of Nurses, more than 2,200 nurses have been confirmed to have died during COVID-19, and an increasing number of them are leaving their jobs, with an estimated shortage of 14 million nurses by 2030 (ICN, 2021; Raso et al., 2021). The prevalence of COVID-19 means that more nurses are needed to provide specialist healthcare. Therefore, it is crucial to ensure the occupational safety and health of nurses, which may reduce the loss of nurses to a certain extent.

As one of the major occupational hazards in the healthcare industry (Awan et al., 2021), suicide is divided into suicide ideation, attempts, and death. Suicide ideation refers to the individual having the idea of dying, but not taking any actual action. Suicide attempt refers to the individual not only having the idea of death but also engaging in actual

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suicidal behaviors; however, these suicide behaviors do not cause death. Suicide death means that the individual has engaged in suicidal behaviors that led to death (Chinese National Health Commission, 2008; CDC, 2015). Suicide ideation and attempts are strong predictors of suicide death (Jobes & Joiner, 2019). Numerous studies have shown that nurses are at a higher risk of suicide ideation and attempts than the general population (Liu et al., 2018; Sofer, 2018). A study in Guangdong, China, found that 43.8% of nurses in general hospitals had considered or attempted suicide, and 28.7% had considered suicide at least once in the past year (Wang, 2009). A previous study showed that approximately 6.5% ($n = 306$) of 4,692 Chinese nurses surveyed had experienced suicide ideations during the COVID-19 outbreak (Hong et al., 2021). Another study reviewed local media and medical websites and found 46 cases of nurse suicide deaths reported or published between 2007 and 2016 (Zeng et al., 2018). This means that there is an urgent need to identify risk factors for suicide ideation and attempts in nurses and to develop targeted interventions to prevent their suicidal deaths.

Workplace bullying is another occupational hazard that threatens the safety and health of nurses. Nurses topped the list of professions reported by the International Labour Organization to be most vulnerable to workplace bullying (ILO, 2017). A recent meta-analysis of 13 articles including 5,745 nurses showed that the pooled prevalence of workplace bullying among nurses was 33.08% (Zhang et al., 2022). Individuals experiencing workplace bullying are often repeatedly isolated, intimidated, belittled, gossiped about, unfairly treated, and/or deprived of certain organizational resources by their colleagues, superiors, or subordinates (Leymann, 1996; Cleary et al., 2010; Li & Gao, 2022). Furthermore, bullying has generally been deemed as a type of psychological rather than physical violence and is categorized into four types: isolation from work, attack on professional status, attack on personality, and direct negative behaviors (Dilek & Aytolan, 2008). It is crucial to note that workplace bullying is associated with a range of adverse outcomes for nurses, such as leaving a job and experiencing psychological problems (Bambi et al., 2019; Al Muharraq et al., 2022). However, few studies have examined whether and how workplace bullying could increase suicide ideation and attempts among nurses. Thus, it is of utmost importance to determine the relationship between workplace bullying and suicide ideation and attempts among nurses.

In Australia, a recent study conducted with middle-aged workers showed that workplace bullying was associated with an increased risk of suicidal thoughts (Leach et al., 2020). In Norway, a survey-based study showed that workplace bullying was associated with subsequent suicidal ideation (Nielsen et al., 2015). These studies provide preliminary support for exploring the relationship between workplace bullying and suicidal ideation in nurses. However, they have left a few key research questions unanswered. First, previous studies (of which there are few) only adjusted for basic sociodemographic factors and work-related characteristics, with no adjustments for physical and mental health conditions known to have an impact on suicide; these include sleep problems, somatic subhealth, anxiety, and depressive symptoms (Sareen et al., 2005; Bernert et al., 2015; Racine, 2018; Ribeiro et al., 2018). This lack of focus on covariates that are well-known to influence the variables of interest may have led to biased findings. Second, from literature reviews, and consistent with the results of a systematic review (Leach et al., 2017), research on the relationship between workplace bullying and suicide attempts is lacking. Despite this lack of related studies, research has shown that suicide attempts rather than suicide ideation are more predictive of suicide deaths (Klonsky et al., 2017), warranting research on examining the strength of the relationships of suicide ideation and suicide attempts with suicide deaths. Third, few studies examined the differences in the associations between various subtypes of workplace bullying and suicide ideation and attempts. This prevents psychologists from acknowledging whether and how specific workplace bullying subtypes are greater risk factors for suicide ideation and attempts than others. Therefore, research is needed to examine the independent effects of workplace bullying subtypes on suicide ideation and attempts among nurses. Fourth, research shows that when there is bullying in the workplace, it is common for different subtypes of bullying to occur concomitantly; for example, a study showed that nurses may experience the cumulative effects of various types of bullying (Wilson, 2016). To date, no study has examined whether nurses who experience multiple types of bullying are more likely to engage in suicide ideation and attempts than those who experience a single type of bullying.

This study aimed to examine the associations between workplace bullying and suicide ideation and attempts in a large and relatively representative sample of nurses from Shandong Province, China, while adjusting for the maximum possible number of potential confounding factors. Furthermore, we aimed to discuss the independent and cumulative effects of different subtypes of workplace bullying on suicide ideation and attempts. We hope this study will help hospital managers identify nurses most at risk of experiencing suicide ideation and attempts, as well as provide new ideas for psychologists to develop targeted prevention and interventions.

Method

Participants

This study was part of the Health Longitudinal Survey of Nurses in Shandong Province, China, which was established

in 2018 using a multi-stage stratified cluster sampling method. First, we stratified the cities in Shandong Province into four categories according to their urbanization development levels (Bian et al., 2009). Thereafter, we selected one city from each category using random number tables and determined four cities for the sampling procedures. Second, we used the same method to choose one tertiary hospital from each selected city as the study site; in total, four tertiary hospitals were selected. Third, after selecting the department as a sampling unit, two-thirds of the departments in each selected hospital were randomly selected from internal, external, obstetrics, and pediatrics. Fourth, all nurses in the selected departments were invited to participate in the study.

The inclusion criteria were nurses who held vocational qualification certificates and actively practiced during the investigation. The exclusion criteria were nurses who were on leave, went to other hospitals for further training, had a history of mental health problems, were currently receiving psychotherapy, or were taking antipsychotic medication.

The data used in this study were extracted during the third wave of the COVID-19 pandemic in China. Owing to the pandemic, data were collected online, using "Wenjuanxing" (a platform for electronic questionnaires, https://www.wjx.cn) and WeChat (a social media app). Data collection occurred from October to December 2020. All participants provided informed consent prior to their participation.

Measures

Study Covariates

The sociodemographic and occupational variables were selected according to previous studies (Wang et al., 2020; Zhang et al., 2020), and they included age, sex, marital status, body mass index (BMI), pregnancy, education, monthly income, years of nursing practice, type of nursing role, and number of night shifts per month.

We also measured and controlled for factors known to potentially influence the development of suicide ideation and attempt, including somatic subhealth symptoms, sleep problems, anxiety symptoms, and depression symptoms. All of these variables were coded as dichotomous variables.

The Somatic Complaints of Subhealth Status Questionnaire (Han et al., 2007) was used for measuring somatic subhealth symptoms. It consists of 16 items and is rated on a five-point scale from 0 to 4, with higher scores representing greater severity. A total score ≥ 45 was regarded as the subhealth boundary score. In this study, Cronbach's α of the total scale was 0.95.

The Pittsburgh Sleep Quality Index Scale (Liu et al., 1996) was used for measuring sleep problems. It has 18 self-assessment items, on a scale from 0 to 3. A higher total score indicates poorer sleep quality. A total score of > 7 shows the existence of sleep problems. In this study, Cronbach's α was 0.89.

Anxiety symptoms were measured by the Generalized Anxiety Scale (He et al., 2010). It consists of seven items on a four-point scale from 0 to 3. Higher scores indicate greater anxiety symptoms. In this study, 10 points were used as a cut-off point, and Cronbach's α was 0.93.

Depressive symptoms were measured by the eight-item Patient Health Questionnaire (without the suicide ideation item) (Kroenke et al., 2009). It consists of eight items on a four-point scale from 0 to 3. Higher scores indicate greater depression symptoms. In this study, 10 points were used as a cut-off point, and Cronbach's α was 0.92.

Workplace Bullying

The Chinese version of the Workplace Psychologically Violent Behaviors Instrument was used to assess nurses' perceptions of workplace bullying inflicted on them by their managers, coworkers, and/or subordinates over the past 12 months (Xu, 2018). This 32-item scale comprises four dimensions: individuals' isolation from work (10 items), attack on professional status (nine items), attack on personality (seven items), and direct negative behaviors (six items). Each item is scored from 0 to 5 (never happened–always). The score of each dimension is the sum of the corresponding items, and the scores of the four dimensions are added to obtain the total score. Based on prior classification criteria (Dilek & Aytolan, 2008), we dichotomized the average total scores for this scale (total score/32) into no (< 1) and yes (≥ 1). Similarly, the scores for the four dimensions were dichotomized, and participants with an average score ≥ 1 for a given dimension were considered to have suffered from that bullying subtype. In this study, the Cronbach's α of individuals' isolation from work, attack on professional status, attack on personality, direct negative behaviors, and the total scale were 0.95, 0.97, 0.96, 0.96, and 0.98, respectively.

Suicide Ideation and Attempts

To assess suicide ideation and attempts, we used two items from a five-item scale compiled by Chinese scholars (Tang, 2015). Three items were excluded because they assess an individual's previous history (including the past year) of suicide ideation and attempt. Since we assessed workplace bullying that occurred in the past year, we selected one item ("have you ever seriously considered ending your own life in the past year?") to assess suicide ideation and another ("have you ever performed a behavior to end your own life in the past year?") to assess suicide attempts. Each item was scored from 1 to 3 (never–always). We classified participants who did not engage in suicide ideation and attempts with a

score of 1 (never), and those who did with 2–3 (sometimes, always) (Tang, 2015; Zhu, 2018).

Statistical Analyses

Continuous variables were described as mean ± standard deviation (M ± SD). Categorical variables were presented as frequencies (*n*) and percentages (%). We used SPSS, version 26.0 to conduct all statistical analyses, and a two-sided p value of 0.05 was considered statistically significant. First, we analyzed the associations of all covariables with suicide ideation and attempts using binary logistic regression. Thereafter, in subsequent logistic regressions with workplace bullying as independent variables and suicide ideation and attempts as dependent variables, we adjusted for those covariates that showed statistically significant associations with the two dependent variables.

We first explored the associations of workplace bullying with suicide ideation and attempt separately, without adjusting for any covariates. Subsequently, we used hierarchical logistic regressions to adjust for covariates and examine the relationships between workplace bullying and suicide ideation and attempts. Regression block 1 included the following independent variables: exposures to workplace bullying (Model 1), different subtypes of workplace bullying (Model 2), and the number of bullying subtypes (Model 3). In Model 2, to explore whether specific bullying subtypes were associated with suicide ideation and attempts, we included individuals' isolation from work, attack on professional status, attack on personality, and direct negative behaviors. In Model 3, to examine the cumulative effects of different workplace bullying subtypes on suicide ideation and attempts, we categorized nurses into five groups: those who experienced (1) no bullying (reference), (2) one bullying subtype, (3) two bullying subtypes, (4) three bullying subtypes, and (5) four bullying subtypes.

In the regression analysis with suicidal ideation as the dependent variable, we adjusted for somatic subhealth symptoms, sleep problems, anxiety symptoms, and depressive symptoms. For suicide attempts, we adjusted for mean monthly income, somatic subhealth symptoms, sleep problems, anxiety symptoms, and depressive symptoms. We reported odds ratios (ORs) and 95% confidence intervals (CIs) for all logistic regression models.

Results

Sample Characteristics and Their Associations with Suicide Ideation and Attempts

In total, we analyzed the data of 1,901 nurses, among which 96.3% were female, and their mean age was 31.31 ± 6.04 years. Among the covariates, type of nursing role was significantly associated with suicide ideation, and monthly income with suicide attempts. Furthermore, somatic subhealth symptoms, sleep problems, anxiety, and depression were all significantly associated with an increased risk of suicide ideation. Significant associations with suicide attempts were also detected. More details are provided in Table 1.

Prevalence of Workplace Bullying and Suicide Ideation and Attempts

As shown in Table 2, 582 (30.6%) participants reported experiencing workplace bullying, 320 (16.8%) reported engaging in suicidal ideation, and 206 (10.8%) reported suicide attempts in the past year.

Associations Between Workplace Bullying and Suicide Ideation and Attempts

Nurses who experienced workplace bullying had a significantly higher risk of suicide ideation and suicide attempts. After adjusting for covariates, nurses with exposures to workplace bullying had a significantly higher risk of suicide ideation and suicide attempts than those who had not experienced workplace bullying (Tables 3 and 4).

Associations Between Workplace Bullying Subtypes and Suicide Ideation and Attempts

As seen in Table 3, we observed that isolation from work and attack on personality were significant risk factors of suicidal ideation. However, after adjusting for covariates, individuals' isolation from work and direct negative behaviors were significant risk factors of suicide ideation.

As shown in Table 4, isolation from work, attack on personality, and direct negative behaviors had significant relationships with suicide attempts. After adjusting for covariates, these three variables remained significant.

Associations Between Cumulative Workplace Bullying and Suicide Ideation and Attempts

As shown in Table 3, nurses who suffered from one, two, three, and four bullying subtypes all had increased odds of engaging in suicidal ideation compared with those who did not suffer from workplace bullying. The more subtypes of workplace bullying experienced by nurses, the greater the risk of suicidal ideation. After adjusting for covariates, we observed similar results, although the risk was slightly reduced, and suffering from one bullying subtype was not a significant risk factor of suicidal ideation.

Table 1 Sample characteristics and their associations with suicide ideation and attempt

Variables	Total sample ($n=1901$) n (%) M ± SD	Suicide ideation ($n=320$) n (%) M ± SD	*OR* (95%*CI*)	*P*	Suicide attempt ($n=206$) n (%) M ± SD	*OR* (95%*CI*)	*P*
Age	31.31 ± 6.04	31.20 ± 5.55	1.00 (0.96, 1.05)	0.996	31.24 ± 4.93	0.99 (0.94, 1.05)	0.785
Sex							
Male	70 (3.7)	16 (5.0)	1		11 (5.3)	1	
Female	1831 (96.3)	304 (95.0)	0.71 (0.36, 1.41)	0.326	195 (94.7)	0.66 (0.30, 1.46)	0.305
Marital status							
Married	1325 (69.7)	220 (68.8)	1		152 (73.8)	1	
Other	576 (30.3)	100 (31.3)	1.14 (0.79, 1.66)	0.480	54 (26.2)	0.91 (0.58, 1.44)	0.697
BMI							
18.5 ~ 23.9	173 (9.1)	28 (8.8)	1		14 (6.8)	1	
< 18.5	1180 (62.1)	193 (60.3)	1.13 (0.69, 1.83)	0.631	120 (58.3)	1.38 (0.74, 2.58)	0.313
≥ 24	548 (28.8)	99 (30.9)	1.04 (0.62, 1.76)	0.877	72 (35.0)	1.50 (0.77, 2.91)	0.230
Pregnancy							
Yes	113 (5.9)	20 (6.3)	1		16 (7.8)	1	
No	1788 (94.1)	300 (93.8)	0.86 (0.49, 1.54)	0.590	190 (92.2)	0.73 (0.39, 1.36)	0.320
Education level							
Junior college or below	160 (8.4)	24 (7.5)	1		16 (7.8)	1	
Bachelor degree or above	1741 (91.6)	296 (92.5)	1.43 (0.82, 2.48)	0.210	190 (92.2)	1.14 (0.59, 2.22)	0.702
Monthly income							
< 4000yuan	425 (22.4)	80 (25.0)	1		60 (29.1)	1	
4000 ~ 8000	1090 (57.3)	177 (55.3)	0.88 (0.63, 1.24)	0.465	113 (54.9)	0.67 (0.45, 0.98)	**0.039**
8000 ~ 10,000	288 (15.1)	44 (13.8)	0.90 (0.56, 1.45)	0.676	22 (10.7)	0.48 (0.27, 0.86)	**0.014**
> 10,000	98 (5.2)	19 (5.9)	1.05 (0.55, 2.04)	0.874	11 (5.3)	0.64 (0.29, 1.41)	0.267
Years of nursing practice							
≤ 5	712 (37.5)	107 (33.4)	1		60 (29.1)	1	
6 ~ 10	651 (34.2)	125 (39.1)	1.28 (0.83, 1.97)	0.269	93 (45.1)	1.46 (0.87, 2.47)	0.152
≥ 11	538 (28.3)	88 (27.5)	1.08 (0.56, 2.06)	0.829	53 (25.7)	0.97 (0.44, 2.13)	0.943
Type of nursing role							
Nurse	402 (21.1)	70 (21.9)	1		38 (18.4)	1	
Nurse practitioner	870 (45.8)	143 (44.7)	0.64 (0.42, 0.99)	**0.047**	97 (47.1)	0.88 (0.51, 1.53)	0.647
Supervisor or above	629 (33.1)	107 (33.4)	0.74 (0.42, 1.32)	0.307	71 (34.5)	1.20 (0.59, 2.43)	0.618
Number of night shifts per month							
< 5	743 (39.1)	106 (33.1)	1		66 (32.0)	1	
≥ 5	1158 (60.9)	214 (66.9)	1.24 (0.93, 1.67)	0.153	140 (68.0)	1.27 (0.89, 1.80)	0.183
Somatic subhealth symptoms							
No	1718 (90.4)	234 (73.1)	1		144 (69.9)	1	
Yes	183 (9.6)	86 (26.9)	1.89 (1.29, 2.78)	**0.001**	62 (30.1)	1.89 (1.24, 2.88)	**0.0003**
Sleep problems							
No	636 (33.5)	38 (11.9)	1		22 (10.7)	1	
Yes	1260 (66.3)	280 (87.5)	2.54 (1.74, 3.71)	**< 0.001**	182 (88.3)	2.38 (1. 47, 3.86)	**< 0.001**
Missing	5 (0.3)	2 (0.6)	NA		2 (1.0)	NA	
GAD-7							
No	1651 (86.8)	204 (63.7)	1		125 (60.7)	1	
Yes	250 (13.2)	116 (36.3)	2.11 (1.46, 3.06)	**< 0.001**	81 (39.3)	1.88 (1.23, 2.86)	**0.004**
PHQ-8							
No	1575 (82.9)	172 (53.8)	1		101 (49.0)	1	
Yes	326 (17.1)	148 (46.3)	3.01 (2.13, 4.26)	**< 0.001**	105 (51.0)	3.07 (2.05, 4.60)	**< 0.001**

Table 2 Prevalence of workplace bullying and suicide ideation and attempt

Variables, *n* (%)	Total sample (*n* = 1901)
Workplace bullying	582 (30.6)
Individual's isolation from work	312 (16.4)
Attack on professional status	333 (17.5)
Attack on personality	322 (16.9)
Direct negative behaviors	299 (15.7)
1 bullying types	112 (5.9)
2 bullying types	121 (6.4)
3 bullying types	48 (2.5)
4 bullying types	192 (10.1)
Suicide ideation	320 (16.8)
Suicide attempts	206 (10.8)

Nurses who suffered from one, two, three, and four bullying subtypes all had a significantly increased risk of engaging in suicide attempts compared with those who did not experience workplace bullying. After adjusting for covariates, only experiencing one bullying subtype became a non-significant risk factor of suicide attempts (Table 4).

Discussion

To the best of our knowledge, this was the first study to analyze the independent and cumulative effects of different subtypes of workplace bullying on suicide ideation and attempts in a large and representative sample of nurses in China. Our results revealed that nurses who were victims of workplace bullying were more likely to report suicide ideation and attempts. In addition, after adjusting for various covariates, individuals' isolation from work and direct negative behavior were risk factors for both suicide ideation and attempts, whereas attack on personality was a risk factor only for suicide attempts. Furthermore, we found that nurses who experienced multiple bullying subtypes showed an increased risk of suicide ideation and attempts. We observed a dose–response effect of the number of bullying subtypes on suicide ideation and attempts; the higher the number of

Table 3 Associations between workplace bullying and suicide ideation

Model	Variables	Unadjusted *OR* (95%*CI*)	*P* value	Adjusted *OR*[a] (95%*CI*)	*P* value
Model 1	Workplace bullying (ref = no)	5.23 (4.06, 6.74)	< 0.001	3.19 (2.41, 4.21)	< 0.001
Model 2	Individual's isolation from work (ref = no)	2.21 (1.41, 3.46)	0.001	2.39 (1.49, 3.82)	< 0.001
	Attack on professional status (ref = no)	1.49 (0.93, 2.38)	0.100	0.93 (0.56, 1.52)	0.761
	Attack on personality (ref = no)	2.31 (1.19, 4.47)	0.013	1.74 (0.90, 3.36)	0.101
	Direct negative behaviors (ref = no)	1.77 (0.92, 3.39)	0.086	1.94 (1.01, 3.76)	0.048
Model 3	1 bullying types (ref = 0)	1.83 (1.08, 3.13)	0.026	1.13 (0.64, 1.99)	0.684
	2 bullying types (ref = 0)	4.56 (2.99, 6.94)	< 0.001	2.91 (1.84, 4.59)	< 0.001
	3 bullying types (ref = 0)	3.56 (1.84, 6.89)	< 0.001	2.60 (1.28, 5.30)	0.009
	4 bullying types (ref = 0)	14.30 (10.20, 20.07)	< 0.001	7.91 (5.46, 11.47)	< 0.001

[a]Type of nursing role, somatic subhealth symptoms, sleep problems, anxiety, and depressive symptoms were adjusted for in the regression models

Table 4 Associations between workplace bullying and suicide attempt

Model	Variables	Unadjusted *OR* (95%*CI*)	*P* value	Adjusted *OR*[a] (95%*CI*)	*P* value
Model 1	Workplace bullying (ref = no)	8.52 (6.12, 11.86)	< 0.001	5.25 (3.69, 7.49)	< 0.001
Model 2	Individual's isolation from work (ref = no)	2.39 (1.39, 4.13)	0.002	2.45 (1.41, 4.26)	0.001
	Attack on professional status (ref = no)	1.08 (0.60, 1.94)	0.797	0.72 (0.40, 1.31)	0.286
	Attack on personality (ref = no)	3.74 (1.74, 8.05)	0.001	2.93 (1.40, 6.15)	0.004
	Direct negative behaviors (ref = no)	2.18 (1.05, 4.56)	0.038	2.39 (1.16, 4.92)	0.018
Model 3	1 bullying types (ref = 0)	2.09 (1.04, 4.19)	0.038	1.32 (0.64, 2.72)	0.456
	2 bullying types (ref = 0)	5.27 (3.16, 8.80)	< 0.001	3.39 (1.96, 5.87)	< 0.001
	3 bullying types (ref = 0)	4.26 (1.92, 9.48)	< 0.001	3.05 (1.33, 7.00)	0.009
	4 bullying types (ref = 0)	23.17 (15.87, 33.81)	< 0.001	13.62 (9.01, 20.59)	< 0.001

[a]Monthly income, somatic subhealth symptoms, sleep problems, anxiety, and depressive symptoms were adjusted for in the regression models

bullying subtypes experienced by nurses, the higher their risk of engaging in suicide ideation and attempts.

In this study, the prevalence of workplace bullying was 30.6%; this rate is consistent with the results of a study with nurses from tertiary hospitals in Beijing, China (Zong et al., 2020). Our finding indicates that workplace bullying among nurses in China is a growing social malpractice, which requires urgent prevention and management interventions. Furthermore, we found that the prevalence of suicide ideation and attempts was 16.8% and 10.8%, respectively, in our sample. These results are much higher than the prevalence rates of 3.9% and 0.8% reported in a recent meta-analysis of suicide ideation and attempts in the general population of China (Cao et al., 2015). Our findings reaffirm that Chinese nurses are at a high risk of suicide. Furthermore, we had to consider the impact of the COVID-19 pandemic; facing a surge in workload, worry about being infected, job segregation, and incomprehension of some patients may have contributed to suicide ideation and attempts (Awan et al., 2021).

Consistent with prior research in general populations (Nielsen et al., 2015; Leach et al., 2020), our study demonstrated that nurses who experienced workplace bullying were more likely to engage in suicide ideation and attempts. Nurses exposed to persistent and uncontrolled workplace bullying may experience psychache (Nielsen et al., 2012; Chan et al., 2019). Psychache is defined as a state of emotional/psychological pain caused by humiliation, guilt, anger, loneliness, and despair owing to a blocked or unfulfilled psychological need. When this psychological pain reaches the threshold of an individual, it can lead to suicide (Shneidman, 1993). In addition, repeated exposures to workplace bullying may cause a series of neuroendocrine and immunological changes, including increased activity of the hypothalamic–pituitary–adrenal axis and sympathetic nervous system (Reader et al., 2015; Rajalingam et al., 2021). Such repeated exposures may also elevate inflammatory markers (Jacobsen et al., 2018; Rajalingam et al., 2020), which may facilitate individual engagement in suicide ideation and attempts (Ernst et al., 2009; Van Heeringen & Mann, 2014).

Regarding bullying subtypes, after adjusting for a comprehensive number of covariates, we found that individuals' isolation from work and direct negative behaviors were significant risk factors of both suicide ideation and attempts, while attack on personality only increased the risk of suicide attempts. According to the interpersonal suicide theory (Joiner, 2005), frustrated belonging (e.g., social isolation and poor interpersonal communication) is one of the main risk factors for suicide. Furthermore, research supports the significant predictive role of interpersonal issues for suicide (Trout, 1980; Calati et al., 2019). Direct negative behaviors refer primarily to an individual being threatened, intimidated, or forced to resign or change workplaces, or having one's personal belongings destroyed (Dilek & Aytolan, 2008). This subtype of bullying may evoke a prolonged period of fear and high tension, which can thereby accelerate the process for individuals to experience a state of entrapment; in such cases, individuals may feel defeated and think that all escape routes are blocked or that there is no hope of rescue (Paul et al., 1998; Forkmann & Teismann, 2017). This may lead one to perceive suicide as a suitable solution for ending the state of entrapment (O'Connor & Kirtley, 2018). According to the escape theory (Baumeister, 1990), suicide can be seen as the ultimate step in escaping from the self and the world. An attack on personality may result in unfavorable self-attribution during self-reflection, aggravating self-loathing (e.g., feeling incompetent, unlikable, or guilty), and misanthropy, which may weaken one's fear of death, strengthen their belief in suicide as a viable option, and increase the likelihood of suicide attempts (Baumeister, 1990).

After adjusting for a comprehensive set of covariates, the associations of attack on personality with suicide ideation became non-significant, whereas the effects of direct negative behaviors on suicide ideation and attempts remained significant. This may be because the effects of attack on personality on suicide ideation were mediated by one or more of the covariates we analyzed. The covariates comprised physical and psychiatric symptoms (i.e., somatic subhealth symptoms, sleep problems, anxiety, and depression symptoms). Any of these health problems experienced by nurses may have masked the effects of attack on professional status and attack on personality on their suicidality.

We also found that experiencing multiple bullying subtypes was significantly associated with an increased risk of both suicide ideation and attempts. The likelihood of suicide ideation and attempts increased with the number of subtypes experienced, especially when all four bullying behaviors were experienced. This finding is consistent with the cumulative risk hypothesis, which suggests that the accumulation of multiple risk factors increases the possibility of adverse health outcomes (Rutter, 1979). To date, our study is the first to report the cumulative effects of multiple workplace bullying subtypes on suicide ideation and attempts in nurses.

The COVID-19 pandemic is recurring and ongoing, and every healthcare worker is essential. Hospitals should create a harmonious and fair working atmosphere to reduce the occurrence of workplace bullying and establish or improve the reporting and management system of workplace bullying. Additionally, as Ralph et al.'s study shows (2021), nurses should be able to avail mental health services provided by psychologists. These professional psychologists can implement targeted psychological interventions for nurses who have developed suicide ideation or attempts to prevent them from suicide death. They can also assist hospital managers to identify individuals who have been bullied in the workplace and screen them for suicide ideation and attempts,

formulating preventive measures to best ensure the occupational safety and health of nurses. These measures may contribute to nurse retention, which is beneficial to the operation of the entire healthcare system.

Limitations

The study has several limitations. First, we used a cross-sectional design; therefore, we could not infer causal relationships for the variables of interest. It is recommended that future research follows evidence-based designs. Nevertheless, we adjusted for a comprehensive number of potential confounders when examining these associations to ensure that our results were as accurate as possible. Second, we used self-reported questionnaires, which may lead to recall bias and be less objective. However, suicide ideation and attempts are considered private and stigmatizing states for individuals (Klonsky et al., 2016), denoting that confidential self-reported measures may be more reliable when assessing these constructs compared with less-confidential measurement tools. Furthermore, the scale we used to measure workplace bullying was reliable and valid (Zong et al., 2020). Third, we measured both suicide ideation and attempts using only two items. Additionally, these two items have been widely applied in past research conducted across China (Wang, 2009; Tang, 2015). Despite this limitation, a standard screening scale for assessing suicide ideation and attempts is lacking (Klonsky et al., 2016). Fourth, we recruited nurses only from tertiary hospitals in China, potentially limiting the generalizability of our findings to other settings. However, it is crucial to focus on nurses in tertiary hospitals because of the higher occupational stress and skill requirements, as well as the more complex interpersonal structures presented in these hospitals compared to other levels of hospitals (Castronovo et al., 2016). Fifth, our study lacked measures of variables related to the COVID-19 pandemic, such as experience fighting the outbreak in a high-risk area, working closely with patients with COVID-19, infection of one or more family members or colleagues with COVID-19, the experience of quarantine in a hotel or at home, personal perceptions of or attitudes toward COVID-19, reduced social activities, overwork due to staffing shortages, and lack of medical necessities. Studies have shown that these variables may be associated with suicide ideation and attempts (Farooq et al., 2021; Hong et al., 2021; Liang et al., 2022). Future studies should consider these covariates when examining the association between workplace factors, such as workplace bullying, and nurse suicide to estimate their relationship more accurately.

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Author Contributions YL: concept and design, analysis, writing the manuscript, the revision of manuscript. MS: data collection. YL: review& editing. LW: interpretation of data, the revision of manuscript. XZ: the critical revision of manuscript. JW: review & editing. YH: methodology. FC: concept and design, project administration, resources, supervision, validation, writing review& editing. All the authors have approved the final draft.

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Data Availability Research data are not shared.

Code Availability Not applicable.

Declarations

Conflict of Interest The authors Yan'e Lu, Meng Sun, Yang Li, Liuliu Wu, Xuan Zhang, Juan Wang, Yongqi Huang, and Fenglin Cao declare no conflicts of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Prior to the study, the research protocol was approved by the ethics review board of Shandong University School of Nursing and Rehabilitation (2020-R-061).

Consent to Participate All participants provided informed consent prior to their participation.

Consent for Publication Not applicable.

References

AlMuharraq, E. H., Baker, O. G., & Alallah, S. M. (2022). The prevalence and the relationship of workplace bullying and nurses turnover intentions: A cross sectional study. *SAGE Open Nursing, 8*, 2095727839. https://doi.org/10.1177/23779608221074655

Awan, S., Diwan, M. N., Aamir, A., Allahuddin, Z., Irfan, M., Carano, A., Vellante, F., Ventriglio, A., Fornaro, M., Valchera, A., Pettorruso, M., Martinotti, G., Di Giannantonio, M., Ullah, I., & De Berardis, D. (2021). Suicide in healthcare workers: Determinants, challenges, and the impact of COVID-19. *Frontiers in Psychiatry, 12*, 792925. https://doi.org/10.3389/fpsyt.2021.792925

Bambi, S., Guazzini, A., Piredda, M., Lucchini, A., De Marinis, M. G., & Rasero, L. (2019). Negative interactions among nurses: An explorative study on lateral violence and bullying in nursing work settings. *Journal of Nursing Management, 27*(4), 749–757. https://doi.org/10.1111/jonm.12738

Baumeister, R. F. (1990). Suicide as escape from self. *Psychological Review, 97*(1), 90–113. https://doi.org/10.1037//0033-295X.97.1.90

Bernert, R. A., Kim, J. S., Iwata, N. G., & Perlis, M. L. (2015). Sleep disturbances as an evidence-based suicide risk factor. *Current Psychiatry Reports, 17*(3), 554. https://doi.org/10.1007/s11920-015-0554-4

Bian, E., Fu, H., & Liu, Z. (2009). Regional difference analysis of the urbanization level in Shandong Province. *Journal of Capital Normal University (Natural Science Edition), 30*(02), 52–55. https://doi.org/10.3969/j.issn.1004-9398.2009.02.013

Calati, R., Ferrari, C., Brittner, M., Oasi, O., Olié, E., Carvalho, A. F., & Courtet, P. (2019). Suicidal thoughts and behaviors and social isolation: A narrative review of the literature. *Journal of Affective Disorders, 245*, 653–667. https://doi.org/10.1016/j.jad.2018.11.022

Cao, X., Zhong, B., Xiang, Y., Ungvari, G. S., Lai, K. Y. C., Chiu, H. F. K., & Caine, E. D. (2015). Prevalence of suicidal ideation and suicide attempts in the general population of China: A meta-analysis. *International Journal of Psychiatry in Medicine, 49*(4), 296–308. https://doi.org/10.1177/0091217415589306

Castronovo, M. A., Pullizzi, A., & Evans, S. (2016). Nurse bullying: A review and a proposed solution. *Nursing Outlook, 64*(3), 208–214. https://doi.org/10.1016/j.outlook.2015.11.008

Chan, C. M. H., Wong, J. E., Yeap, L. L. L., Wee, L. H., Jamil, N. A., & Swarna, N. Y. (2019). Workplace bullying and psychological distress of employees across socioeconomic strata: A cross-sectional study. *BMC Public Health, 19*(Suppl 4), 608. https://doi.org/10.1186/s12889-019-6859-1

Cleary, M., Hunt, G. E., & Horsfall, J. (2010). Identifying and addressing bullying in nursing. *Issues in Mental Health Nursing, 31*(5), 331–335. https://doi.org/10.3109/01612840903308531

Dilek, Y., & Aytolan, Y. (2008). Development and psychometric evaluation of workplace psychologically violent behaviours instrument. *Journal of Clinical Nursing, 17*(10), 1361–1370. https://doi.org/10.1111/j.1365-2702.2007.02262.x

Ernst, C., Mechawar, N., & Turecki, G. (2009). Suicide neurobiology. *Progress in Neurobiology, 89*(4), 315–333. https://doi.org/10.1016/j.pneurobio.2009.09.001

Farooq, S., Tunmore, J., Wajid, Ali M., & Ayub, M. (2021). Suicide, self-harm and suicidal ideation during COVID-19: A systematic review. *Psychiatry Research, 306*, 114228. https://doi.org/10.1016/j.psychres.2021.114228

Forkmann, T., & Teismann, T. (2017). Entrapment, perceived burdensomeness and thwarted belongingness as predictors of suicide ideation. *Psychiatry Research, 257*, 84–86. https://doi.org/10.1016/j.psychres.2017.07.031

Han, B., Kong, J., Liu, W., & Tu, Y. (2007). Somatic complaints of subhealth status questionnaire: Reliability and validity. *Chinese Mental Health Journal, 2021*(06), 382–385. https://doi.org/10.3321/j.issn:1000-6729.2007.06.009

He, X., Li, C., Qian, J., & Cui, H. (2010). Reliability and validity of a generalized anxiety disorder scale in general hospital outpatients. *Shanghai Archives of Psychiatry, 22*(04), 200–203. https://doi.org/10.3969/j.issn.1002-0829.2010.04.002

Hong, S., Ai, M., Xu, X., Wang, W., Chen, J., Zhang, Q., Wang, L., & Kuang, L. (2021). Immediate psychological impact on nurses working at 42 government-designated hospitals during COVID-19 outbreak in China: A cross-sectional study. *Nursing Outlook, 69*(1), 6–12. https://doi.org/10.1016/j.outlook.2020.07.007

International Labour Organization. (2017). *Research on violence cases in the workplace—prevention and intervention*. Retrieved 7 July 2022 from https://www.ilo.org/global/topics/safety-and-health-at-work/events-training/events-meetings/WCMS_606681/lang--en/index.htm

International Council of Nurses. (2021). *The COVID-19 Effect: World's nurses facing mass trauma, an immediate danger to the profession and future of our health systems*. Retrieved 5 July 2022 from https://www.icn.ch/news/covid-19-effect-worlds-nurses-facing-mass-trauma-immediate-danger-profession-and-future-our

Jacobsen, D. P., Nielsen, M. B., Einarsen, S., & Gjerstad, J. (2018). Negative social acts and pain: Evidence of a workplace bullying and 5-HTT genotype interaction. *Scandinavian Journal of Work, Environment & Health, 44*(3), 283–290. https://doi.org/10.5271/sjweh.3704

Jobes, D. A., & Joiner, T. E. (2019). Reflections on suicidal ideation. *Crisis the Journal of Crisis Intervention & Suicide Prevention, 40*(4), 227–230. https://doi.org/10.1027/0227-5910/a000615

Joiner, T. (2005). Why people die by suicide. *Amwa Journal American Medical Writers Association Journal, 295*(3), 2082–2083. https://doi.org/10.1001/jama.295.17.2082

Klonsky, E. D., May, A. M., & Saffer, B. Y. (2016). Suicide, suicide attempts, and suicidal ideation. *Annual Review of Clinical Psychology, 12*, 307–330. https://doi.org/10.1146/annurev-clinpsy-021815-093204

Klonsky, E. D., Qiu, T., & Saffer, B. Y. (2017). Recent advances in differentiating suicide attempters from suicide ideators. *Current Opinion in Psychiatry, 30*(1), 15–20. https://doi.org/10.1097/YCO.0000000000000294

Kroenke, K., Strine, T. W., Spitzer, R. L., Williams, J. B. W., Berry, J. T., & Mokdad, A. H. (2009). The PHQ-8 as a measure of current depression in the general population. *Journal of Affective Disorders, 114*(1–3), 163–173. https://doi.org/10.1016/j.jad.2008.06.026

Lai, J., Ma, S., Wang, Y., Cai, Z., & Hu, S. (2020). Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Network Open*. https://doi.org/10.1001/jamanetworkopen.2020.3976

Leach, L. S., Poyser, C., & Butterworth, P. (2017). Workplace bullying and the association with suicidal ideation/thoughts and behaviour: A systematic review. *Occupational and Environmental Medicine, 74*(1), 72–79. https://doi.org/10.1136/oemed-2016-103726

Leach, L. S., Too, L. S., Batterham, P. J., Kiely, K. M., Christensen, H., & Butterworth, P. (2020). Workplace bullying and suicidal ideation: Findings from an Australian longitudinal cohort study of mid-aged workers. *International Journal of Environmental Research and Public Health, 17*(4), 1448. https://doi.org/10.3390/Ijerph17041448

Leymann, H. (1996). The content and development of mobbing at work. *European Journal of Work and Organizational Psychology, 5*(2), 165–184. https://doi.org/10.1080/13594329608414853

Li, L., & Gao, F. (2022). Research progress on measurement tools and influencing factors of workplace bullying among nurses. *Chinese Journal of Modern Nursing, 28*(6), 837–840. https://doi.org/10.3760/cma.j.cn115682-20210716-03166

Liang, S., Liu, L., Peng, X., Chen, J., Huang, A., Wang, X., Zhao, J., Fan, F., & Liu, X. (2022). Prevalence and associated factors of suicidal ideation among college students during the COVID-19 pandemic in China: A 3-wave repeated survey. *BMC Psychiatry, 22*(1), 336. https://doi.org/10.1186/s12888-022-03968-2

Liu, X., Lv, S., Dong, B., & Fang, H. (2018). Suicidal ideation and its related factors among nurses of oncology departments of four cities in China. *China Journal of Modern Medicine, 28*(08), 76–81. https://doi.org/10.3969/j.issn.1005-8982.2018.08.016

Liu, X., Tang, M., Hu, L., & Wang, A. (1996). Reliability and validity of Pittsburgh sleep quality index. *Chinese Journal of Psychiatry, 2021*(02), 103–107. https://doi.org/10.1007/BF02951625

National Health Commission of the People's Republic of China. (2008). *Notice of the General Office of the Ministry of Health on forwarding the "Principles for Handling Common Clinical Mental Health Problems after Disasters"*. Retrieved 5 July 2022 from http://www.nhc.gov.cn/bgt/pw10809/200806/74c7f829905c4efc8c6bedf2225cc673.shtml

Nielsen, M. B., Hetland, J., Matthiesen, S. B., & Einarsen, S. (2012). Longitudinal relationships between workplace bullying and psychological distress. *Scandinavian Journal of Work, Environment & Health, 38*(1), 38–46. https://doi.org/10.5271/sjweh.3178

Nielsen, M. B., Nielsen, G. H., Notelaers, G., & Einarsen, S. (2015). Workplace bullying and suicidal ideation: A 3-Wave longitudinal Norwegian study. *American Journal of Public Health, 105*(11), e23–e28. https://doi.org/10.2105/AJPH.2015.302855

O'Connor, R. C., & Kirtley, O. J. (2018). The integrated motivational-volitional model of suicidal behaviour. *Philosophical Transactions of the Royal Society of London: Series B, Biological Sciences, 373*(1754), 20170268. https://doi.org/10.1098/rstb.2017.0268

Paul, G., & Steven, A. (1998). The role of defeat and entrapment (arrested flight) in depression: An exploration of an evolutionary view. *Psychological Medicine, 3*(28), 585–598. https://doi.org/10.1017/S0033291798006710

Racine, M. (2018). Chronic pain and suicide risk: A comprehensive review. *Progress in Neuro-Psychopharmacology & Biological Psychiatry Part B, 87*, 269–280. https://doi.org/10.1016/j.pnpbp.2017.08.020

Rajalingam, D., Nymoen, I., Jacobsen, D. P., Eriksen, M. B., Dissen, E., Nielsen, M. B., Einarsen, S. V., & Gjerstad, J. (2020). Repeated social defeat promotes persistent inflammatory changes in splenic myeloid cells; Decreased expression of β-arrestin-2 (ARRB2) and increased expression of interleukin-6 (IL-6). *Bmc Neuroscience, 21*(1), 25. https://doi.org/10.1186/s12868-020-00574-4

Rajalingam, D., Nymoen, I., Nyberg, H., Nielsen, M. B., Einarsen, S. V., & Gjerstad, J. (2021). Workplace bullying increases the risk of anxiety through a stress-induced β2-adrenergic receptor mechanism: A multisource study employing an animal model, cell culture experiments and human data. *International Archives of Occupational and Environmental Health*. https://doi.org/10.1007/s00420-021-01718-7

Ralph, J., Freeman, L. A., Ménard, A. D., & Soucie, K. (2021). Practical strategies and the need for psychological support: Recommendations from nurses working in hospitals during the COVID-19 pandemic. *Journal of Health Organization and Management*. https://doi.org/10.1108/JHOM-02-2021-0051

Raso, R., Fitzpatrick, J. J., & Masick, K. (2021). Nurses' intent to leave their position and the profession during the COVID-19 pandemic. *The Journal of Nursing Administration, 51*(10), 488–494. https://doi.org/10.1097/NNA.0000000000001052

Reader, B. F., Jarrett, B. L., McKim, D. B., Wohleb, E. S., Godbout, J. P., & Sheridan, J. F. (2015). Peripheral and central effects of repeated social defeat stress: Monocyte trafficking, microglial activation, and anxiety. *Neuroscience, 289*, 429–442. https://doi.org/10.1016/j.neuroscience.2015.01.001

Ribeiro, J. D., Huang, X., Fox, K. R., & Franklin, J. C. (2018). Depression and hopelessness as risk factors for suicide ideation, attempts and death: Meta-analysis of longitudinal studies. *The British Journal of Psychiatry: The Journal of Mental Science, 212*(5), 279–286. https://doi.org/10.1192/bjp.2018.27

Rutter, M. (1979). Protective factors in children's responses to stress and disadvantage. *Annals of the Academy of Medicine, Singapore, 8*(3), 324–338.

Sareen, J., Cox, B. J., Afifi, T. O., de Graaf, R., Asmundson, G. J. G., ten Have, M., & Stein, M. B. (2005). Anxiety disorders and risk for suicidal ideation and suicide attempts: A population-based longitudinal study of adults. *Archives of General Psychiatry, 62*(11), 1249–1257. https://doi.org/10.1001/archpsyc.62.11.1249

Shneidman, E. S. (1993). Suicide as psychache. *The Journal of Nervous and Mental Disease, 181*(3), 145–147. https://doi.org/10.1097/00005053-199303000-00001

Sofer, D. (2018). Suicide among nurses. *The American Journal of Nursing, 118*(8), 14. https://doi.org/10.1097/01.NAJ.0000544147.83703.35

Tang F. (2015). *Reasearch on risk factors and interaction network for suicidal behavior among Chinese university students* (Ph.D. Candidate, Shandong University). Retrieved from https://d.wanfangdata.com.cn/thesis/ChJUaGVzaXNOZXdTMjAyMTA1MTkSCFkyNzkxMDc4GggxN2oyc3lyeQ%3D%3D

Trout, D. L. (1980). The role of social isolation in suicide. *Suicide & Life-Threatening Behavior, 10*(1), 10–23. https://doi.org/10.1111/j.1943-278x.1980.tb00693.x

US Centers for Disease Control and Prevention. (2015). *Definitions: Self-Directed violence*. Retrieved 23 Aug 2021 from https://www.cdc.gov/suicide/facts/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fviolenceprevention%2Fsuicide%2Ffastfact.html

Van Heeringen, K., & Mann, J. J. (2014). The neurobiology of suicide. *The Lancet: Psychiatry, 1*(1), 63–72. https://doi.org/10.1016/S2215-0366(14)70220-2

Wang S. (2009). *A cross-sentional study on the current condition and related factors of suicide ideation of nurses from a general hospital in Guangzhou* (master's degree, Sun Yat-Sen University). Retrieved from http://www.wanfangdata.com.cn/details/detail.do?_type=degree&id=Y1602516

Wang, J., Zhang, X., Yang, B., Li, J., Li, Y., Chen, Q., Wu, L., & Cao, F. (2020). Suicidal ideation among nurses: Unique and cumulative effects of different subtypes of sleep problems. *Journal of Affective Disorders, 276*, 600–607. https://doi.org/10.1016/j.jad.2020.07.095

Wilson, J. L. (2016). An exploration of bullying behaviours in nursing: A review of the literature. *British Journal of Nursing (Mark Allen Publishing), 25*(6), 303–306. https://doi.org/10.12968/bjon.2016.25.6.303

Xu M. (2018). *The status and influencing factors of workplace psychological violence against nurses* (master degree, Southern Medical University, Guangzhou, China). Retrieved from https://kns.cnki.net/kcms/detail/detail.aspx?FileName=1018276689.nh&DbName=CMFD2019

Zeng, H. J., Ying, Z. G., Yan, H. H., Yang, X. H., & Jin, H. M. (2018). Chinese nurses are at high risk for suicide: A review of nurses suicide in China 2007–2016. *Archives of Psychiatric Nursing, 32*(6), 896–900. https://doi.org/10.1016/j.apnu.2018.07.005

Zhang, X., Sun, J., Wang, J., Chen, Q., Cao, D., Wang, J., & Cao, F. (2020). Suicide ideation among pregnant women: The role of different experiences of childhood abuse. *Journal of Affective Disorders, 266*, 182–186. https://doi.org/10.1016/j.jad.2020.01.119

Zhang, Y., Cai, J., Yin, R., Qin, S., Wang, H., Shi, X., & Mao, L. (2022). Prevalence of lateral violence in nurse workplace: A systematic review and meta-analysis. *British Medical Journal Open, 12*(3), e54014. https://doi.org/10.1136/bmjopen-2021-054014

Zhu F. (2018). *The research on the relationship amongression and basic psychological need, depression and suicide of college students* (master's degree, Central China Normal University, Hubei, China). Retrieved from https://kns.cnki.net/kcms/detail/detail.aspx?FileName=1018245437.nh&DbName=CMFD2019

Zong, F., Liu, Y., & Li, X. (2020). Workplace psychological violence from working partners and its influencing factors among nurses from grade three hospitals in Beijing. *Journal of Nursing Science, 35*(2), 69–72. https://doi.org/10.3870/j.issn.1001-4152.2020.02.069