

# Does Psychological Capital Mediate Between Workplace Violence and Depressive Symptoms Among Doctors and Nurses in Chinese General Hospitals?

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**Background:** Depressive symptoms related to workplace violence (WPV) have been studied and are the main causes of lower psychological and physical well-being and work motivation. Our study aims to examine the prevalence of depressive symptoms and to explore whether psychological capital (PsyCap) mediates the effect of WPV on depressive symptoms in doctors and nurses.

**Methods:** Participants were recruited from general hospitals in Liaoning, China in 2018. Out of 1218 participants, 1062 (87.2%) completed self-reported questionnaires. Depressive symptoms, WPV and PsyCap were measured by Epidemiologic Studies Depression Scale (CES-D), Workplace Violence Scale (WVS) and Psychological Capital Questionnaire (PCQ), respectively. The related factors of depressive symptoms were investigated by using hierarchical multiple regression in both doctors and nurses.

**Results:** The mean scores of depressive symptoms were  $23.09 \pm 8.38$  in doctors and  $22.33 \pm 8.95$  in nurses, and there was no significant difference between the scores of these two groups. WPV was positively associated with depressive symptoms (doctors:  $\beta=0.349$ ,  $P<0.001$ ; nurses:  $\beta=0.317$ ,  $P<0.001$ ) while PsyCap was negatively associated with depressive symptoms (doctors:  $\beta=-0.101$ ,  $P<0.001$ ; nurses:  $\beta=-0.230$ ,  $P<0.001$ ). In addition, PsyCap acted as a mediating role between WPV and depressive symptoms in both doctors and nurses.

**Conclusion:** Both doctors and nurses had serious depressive symptoms. WPV could aggravate depressive symptoms, while PsyCap could aggravate against depressive symptoms. When PsyCap acted as a mediator, WPV had a negative impact on PsyCap, which could increase doctors' and nurses' depressive symptoms.

**Keywords:** doctors, nurses, workplace violence, depressive symptoms, psychological capital

## Introduction

Workplace violence (WPV) has been in the limelight all walks of life, particularly, health care settings. WHO reported that there were 8–38% of medical personnel who have suffered from workplace violence including verbal abuse, threat and physical violence in 2017.<sup>1</sup> In China, WPV is common in healthcare sectors, and a previous study indicated that more than half of doctors and nurses have been the victims of WPV in medical sectors.<sup>2</sup> WPV has an adverse impact on the psychological and physical well-being of medical personnel,<sup>3,4</sup> and decreases doctors' and nurses' job motivation,<sup>5,6</sup> which is unacceptable. Consequently, this violence places

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medical staff at risk and compromises the quality of medical service, which causes enormous medical resources loss in the healthcare settings.

WPV is defined as the psychological and physical harm that doctors and nurses often are confronted with when providing medical service.<sup>7,8</sup> WPV consists of threat, physical assault, verbal sexual harassment, emotional abuse and sexual assault. Several studies have indicated that WPV significantly and negatively affected medical staff's mental health, and even led to serious mental illnesses like depressive symptoms.<sup>9,10</sup> One study found that 36.3% of medical personnel who had suffered from WPV in hospital reported mild to moderate depressive symptoms, and 16% presented probable major depressive symptoms.<sup>4</sup> Besides, depressive symptoms have an adverse effect on psychological and physical well-being, work performance and job satisfaction, which leads to negative attitudes towards performing medical services. From a long-term point of view, this environment can result in the immense loss of medical human resources, and the serious decline of the quality of health service.<sup>11</sup> It was reported that nurses were at higher risk of being exposed to WPV than doctors in general hospitals.<sup>9</sup> Therefore, our study hypothesized nurses would be more vulnerable to suffer from mental problems than doctors, and examined the impact of WPV on depressive symptoms among doctors and nurses in Chinese general hospitals.

Psychological capital (PsyCap) has been reported as a protective factor for mental illness like depressive symptoms.<sup>12,13</sup> PsyCap exhibits a positive state of mind in the process of individual growth and development.<sup>14</sup> PsyCap includes four core elements, namely, resilience, self-efficacy, hope and optimism.<sup>15</sup> These four elements are defined as important capacities to combat negative emotions and burnouts in the occupational population when they are confronted with difficulties and challenges. According to the theory of systemic assessment of depressive symptoms among registered nurses (SAD-RN),<sup>12</sup> Ross et al proposed that when the nurses perceive stressors (eg, WPV), those who do not possess positive belief and resources (eg, PsyCap) may fail to deal with negative responses caused by stressors and are more likely to develop depressive symptoms. This suggests that PsyCap may relieve the adverse effect of WPV on depressive symptoms in health care workers. In addition, other studies found that PsyCap could mediate and moderate the effect of work-family conflict on depressive symptoms in Chinese female nurses.<sup>13</sup> In other words, it was believed

that PsyCap may be a mediating factor between WPV and depressive symptoms in doctors and nurses.

Therefore, the aims of this study were to 1) examine the prevalence of depressive symptoms and to evaluate its related factors in doctors and nurses, respectively, 2) explore the effect of WPV on depressive symptoms, 3) explore the association of PsyCap and depressive symptoms, and whether psychological capital mediates the effect of WPV on depressive symptoms.

## Methods

### Design and Procedures

This cross-sectional survey was conducted from June to October of 2018 in Liaoning province, China. Random sampling method was applied in our study. According to the geographical distribution, our study randomly selected three cities in Liaoning province, and two general hospitals were randomly selected from each city. The inclusion criteria are that the doctors or nurses should have worked over one year in the general hospitals. After writing the informed consent, each subject would receive a self-administered questionnaire and the study complied with the declaration of Helsinki. The questionnaires were sent to 744 doctors and 474 nurses, and 644 (86.6%) doctors and 418 (88.2%) nurses were selected as the final subjects.

### Measurement of Depressive Symptoms

The Center for Epidemiologic Studies Depression Scale (CES-D) was used to measure depressive symptoms among doctors and nurses in this study.<sup>16</sup> This scale has 20 items, and each item was applied with a 4-point Likert scale from 0 (rarely) to 3 (most or all of the time). The total score of this scale is 0–60, with a higher score indicating severer depressive symptoms. Participants who had 16–19 CES-D score were defined as “mild to moderate depressive symptoms” group, and >19 means “possibility of major depression” group.<sup>16</sup> The CES-D scale has been widely used among medical staff in Chinese hospitals.<sup>17</sup> The Cronbach's alpha coefficient for CES-D was 0.872 (doctors: 0.870, nurses: 0.875) in this study.

### Measurement of Workplace Violence

The frequency of WPV experienced by doctors and nurses was assessed by using the Chinese version of workplace violence scale (WVS).<sup>18</sup> The Chinese version of WVS was originated from Schat version and developed by Wang.<sup>19</sup> The WVS includes five dimensions: verbal sexual

harassment, emotional abuse, physical assault, threat, and sexual assault, and each dimension includes one item. Each item uses a 4-point Likert scale from 0 (never) to 3 ( $\geq 4$  times). The total score of this scale is 0–15, and a higher score indicates a higher frequency of experiencing workplace violence. Several studies that employed this scale have been reported to have good validity and reliability in the occupational population.<sup>20</sup> The internal reliability for WVS was 0.942 (doctors: 0.945, nurses: 0.934) in this study.

## Measurement of Psychological Capital

The level of PsyCap was measured with the Chinese version of the Psychological Capital Questionnaire (PCQ).<sup>21</sup> This scale consists of 24-item and has four core elements, including resilience optimism self-efficacy and hope.<sup>22</sup> Each element has six items, and each item uses a 6-point Likert scale from 1 (strongly disagree) to 6 (strongly agree). This scale has been proved to show good reliability and construct validity in Chinese occupational population.<sup>23,24</sup> The internal reliability coefficient for this scale was 0.943 (doctors: 0.936, nurses: 0.952) in the present study.

Besides, this study included six demographic variables which are marital status, gender, monthly income, weekly working time (hrs), education, and the number of exercises practiced weekly. Gender was categorized as male and female. Marital status included divorced/widowed/separated, unmarried and married/cohabitation. Weekly working time (hrs) was classified as  $<40$  and  $\geq 40$ . Monthly income (RMB) comprised  $<3000$ , 3000–5000 and  $\geq 5000$ . Education background contained junior college or lower, bachelor college and master college or higher. The number of exercises weekly was classified as 0, 1, 2–3 and  $\geq 4$ .

## Statistical Analysis

The data were analyzed using SPSS statistical package version 20.0. One-way ANOVAs or *T*-tests were used to test the distribution of dimensions of depressive symptoms in demographic variables. Also, depressive symptom differences between doctors and nurses were examined by *T*-tests. Correlation coefficients among depressive symptoms, WPV and PsyCap were examined by Pearson's correlation. Hierarchical multiple regression analysis was used to explore related influencing factors of depressive symptoms. Besides age and gender, other demographic variables that were associated with depressive symptoms in univariate analysis ( $P < 0.05$ ) were entered in the regression model. In step 1, age, gender, weekly work time and number of exercises

weekly were added; in step 2, WPV was entered; in step 3, PsyCap was added. There was a partially mediating effect of PsyCap on the association between WPV and depressive symptoms if the regression coefficient ( $\beta$ ) of WPV in step 3 was smaller than that in step 2 with  $P < 0.05$ .<sup>25</sup> PsyCap completely mediated the impact of WPV on depressive symptoms if the regression coefficient ( $\beta$ ) of WPV in step 3 was smaller than that in step 2 with  $P > 0.05$ .<sup>25</sup>

Two-tail  $P < 0.05$  was defined as statistically significant in this study.

## Results

### Demographic Characteristics

Table 1 shows the demographics of doctors and nurses, and the distributions of depressive symptoms. In this study, 644 doctors and 418 nurses participated. The mean age was 33.38 (8.58) and 33.48 (9.35) for doctors and nurses, respectively. More than half of doctors were male. About 73.8% of doctors and 67.0% of nurses were married or cohabited. Approximately half of doctors and nurses hold a bachelor's degree. More than half of doctors' and nurses' monthly income were between 3000 and 5000 (RMB). Weekly work time and the number of exercise practices weekly were related to depressive symptoms in doctors ( $P < 0.05$ ), and a number of exercises weekly were associated with depressive symptoms in nurses ( $P < 0.05$ ).

### Correlations Between Study Variables

Table 2 presents the correlation between depressive symptoms, WPV, and PsyCap. WPV was positively associated with depressive symptoms for both doctors ( $r = 0.346$ ,  $P < 0.01$ ) and nurses ( $r = 0.362$ ,  $P < 0.01$ ), whereas PsyCap was negatively associated with depressive symptoms both doctors ( $r = -0.166$ ,  $P < 0.01$ ) and nurses ( $r = -0.299$ ,  $P < 0.01$ ).

### Comparison of Depressive Symptoms Between Doctors and Nurses

Table 3 reports a comparison of depressive symptoms between doctors and nurses. The mean scores of depressive symptoms were  $23.09 \pm 8.38$  for doctors and  $22.33 \pm 8.95$  for nurses. In total, 530 (mild to moderate depressive symptoms: 14.6%; major depressive symptoms: 66.7%) doctors and 336 (mild to moderate depressive symptoms: 14.1%; major depressive symptoms: 66.3%) nurses had shown depressive symptoms. Also, the numbers did not show the difference in depressive symptoms between doctors and nurses ( $P > 0.05$ ).

**Table 1** Demographic Characteristics of Participants and Results of Univariate Analysis

Variables	N (%)		Depression Mean $\pm$ SD			
	Doctors	Nurses	Doctors	P*	Nurses	P**
Gender						
Male	297(46.1)	9(2.2)	22.92 $\pm$ 9.40	0.633	17.33 $\pm$ 8.22	0.090
Female	347(53.9)	409(97.8)	23.24 $\pm$ 7.41		22.44 $\pm$ 8.95	
Marital status						
Single	159(24.7)	132(31.6)	23.28 $\pm$ 8.56	0.911	23.38 $\pm$ 8.47	0.146
Married/cohabited	475(73.8)	280(67.0)	23.05 $\pm$ 8.26		21.76 $\pm$ 9.11	
Divorced/separated/widowed	10(1.6)	6(1.4)	22.30 $\pm$ 11.85		25.83 $\pm$ 10.44	
Education						
Junior college or lower	28(4.3)	225(53.8)	20.75 $\pm$ 6.16	0.208	22.16 $\pm$ 9.09	0.856
Bachelor college	344(53.4)	190(45.5)	22.92 $\pm$ 8.38		22.56 $\pm$ 8.81	
Master college or above	275(42.2)	3(0.7)	23.55 $\pm$ 8.56		20.67 $\pm$ 10.97	
Monthly income						
$\leq 3000$	91(14.1)	132(31.6)	24.70 $\pm$ 7.07	0.141	23.38 $\pm$ 9.45	0.264
3000–5000	398(61.8)	241(57.7)	22.82 $\pm$ 8.34		21.89 $\pm$ 8.75	
$\geq 5000$	155(24.1)	45(10.8)	22.85 $\pm$ 9.11		21.62 $\pm$ 8.42	
Working time (weekly, h)						
$\leq 40$	55(8.5)	71(17.0)	20.09 $\pm$ 7.84	0.005	21.42 $\pm$ 9.98	0.348
$> 40$	589(91.5)	347(83.0)	23.37 $\pm$ 8.38		22.52 $\pm$ 8.73	
The number of Exercise weekly						
0	301(46.7)	245(58.6)	24.59 $\pm$ 8.96	$< 0.001$	23.41 $\pm$ 9.02	0.021
1	151(23.4)	73(17.5)	22.31 $\pm$ 7.80		20.16 $\pm$ 8.87	
2–3	133(20.7)	71(17.0)	21.12 $\pm$ 6.60		21.65 $\pm$ 9.02	
$\geq 4$	59(9.2)	29(6.9)	21.88 $\pm$ 9.11		20.34 $\pm$ 7.15	

Notes: P\*, the difference of depressive symptoms in different groups created with demographic data among doctors. P\*\*, the difference of depressive symptoms in different groups created with demographic data among nurses.

**Table 2** Correlations Analysis Between WPV, PsyCap and Depression Among Doctors and Nurses

Variables	Doctors		Nurses	
	Age	WPV	PsyCap	Depression
Age	1	–0.041	0.176**	–0.082
WPV	0.099*	1	–0.196**	0.362**
PsyCap	0.072	–0.139**	1	–0.299**
Depression	–0.053	0.346**	–0.166**	1

Notes: \* $P < 0.05$ ; \*\* $P < 0.01$ . The correlations above the diagonal are the doctors and those below the diagonal are the nurses.

**Table 3** Difference of Doctors and Nurses on Depressive Symptoms

Variables	Doctors	Nurses	$t/\chi^2$	p
Depression symptoms	23.09 $\pm$ 8.38	22.33 $\pm$ 8.95	1.406	0.160
16 $\leq$ Scores $\leq$ 19	94(14.6%)	59(14.1%)	0.466	0.240
Scores $\geq$ 19	436(67.7%)	277(66.3%)	0.622	0.733

## Hierarchical Regression Analysis

Table 4 shows that the results of hierarchical multiple regression in doctors. After controlling demographic variables, WPV was positively associated with depressive

symptoms ( $\beta=0.364$ ,  $P<0.001$ ) in step 2. PsyCap was negatively associated with depressive symptoms ( $\beta=-0.101$ ,  $P<0.001$ ) in step 3 while the effect of WPV on depressive symptoms ( $\beta=0.349$ ,  $P<0.001$ ) was smaller

**Table 4** The Linear Regression Analysis Among Doctors

Variables	Doctors-Depressive Symptoms		
	Step 1 ( $\beta$ )	Step 2 ( $\beta$ )	Step 3 ( $\beta$ )
Age	-0.033	-0.072	-0.064
Gender	0.011	0.094*	0.092*
Working time	0.097*	0.059	0.056
The number of Exercise	-0.141***	-0.122***	-0.115**
WPV		0.364***	0.349***
PsyCap			-0.101**
F	5.702***	23.776***	21.281***
Adjusted $R^2$	0.028	0.150	0.159
$R^2$ -change	0.034	0.123	0.010

Notes: \* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ .

compared with that in step 2, which indicated that WPV could become a partial mediator on the association of WPV with depressive symptoms.

Table 5 shows that the results of hierarchical multiple regression in nurses. WPV was positively associated with depressive symptoms ( $\beta=0.359$ ,  $P<0.001$ ) in step 2 after controlling those two demographic variables. PsyCap was negatively associated with depressive symptoms ( $\beta=-0.230$ ,  $P<0.001$ ) in step 3, but the effect of WPV on depressive symptoms ( $\beta=0.317$ ,  $P<0.001$ ) was smaller compared with that in step 3. Thus, PsyCap may mediate the effect of WPV on depressive symptoms in nurses.

## Discussion

The results from this study did not show a significant difference between doctors (mild to moderate depressive symptoms: 14.6%; major depressive symptoms: 66.7%) and nurses (mild to moderate depressive symptoms: 14.1%; major depressive symptoms: 66.3%) on depressive symptoms, which failed to support our hypothesis (nurses would be more vulnerable to suffer from mental

problems than doctors). One of the reasons could be that although both doctors and nurses are medical staff, doctors tend to suffer from a higher level of stress because their work is more directly correlated with patients' health.<sup>13,26</sup> In practice, doctors take more responsibility for the right diagnosis, proper prescription and effective operation; thus, they need to learn the latest medical knowledge and sophisticated medical technologies, and to spend more time communicating with patients and studying their diseases. However, these results were significantly higher than the rates in previous studies which studied approximately 45.3% to 47.2% of healthcare personnel in China.<sup>27,28</sup> In addition, Da Silva et al reported that medical staff in primary care had 52.3% (intermediate depressive symptoms: 36.3%; major depressive symptoms: 16%) depressive symptoms in Brazil.<sup>4</sup> Therefore, we can still conclude that doctors and nurses in Chinese general hospitals are suffering from serious mental problems, and our next priority is to find out the influencing factors of mental health in medical staff.

**Table 5** The Linear Regression Analysis Among Nurses

Variables	Nurses-Depressive Symptoms		
	Step 1 ( $\beta$ )	Step 2 ( $\beta$ )	Step 3 ( $\beta$ )
Age	-0.072	-0.059	-0.025
Gender	0.084	0.095*	0.109*
The number of Exercise	-0.105*	-0.094*	-0.064
WPV		0.359***	0.317***
PsyCap			-0.230***
F	3.559*	18.769***	20.883***
Adjusted $R^2$	0.018	0.146	0.193
$R^2$ -change	0.025	0.129	0.048

Notes: \* $P < 0.05$ ; \*\*\* $P < 0.001$ .



Our results suggested that WPV was positively correlated with depressive symptoms, which were similar to the previous findings.<sup>29–31</sup> In other words, doctors and nurses who suffered from WPV were more likely to develop depressive symptoms, because they confront with violent situations more often, from which they may feel being treated disrespectfully about their dedications and professional knowledge; hence, depressive symptoms may be triggered. Besides, these violent environments would result in heavy stress and burnout.<sup>32–34</sup> Norman et al reported that individuals who suffered WPV would be vulnerable to negative emotions such as fear, anger, and irritability.<sup>35</sup> In addition, another study confirmed that WPV was positively associated with depressive symptoms.<sup>36</sup> In nature, the occurrence of WPV may affect the mental and physical health of doctors and nurses and impair their professional performance, which results in a negative impact on patient's health, eventually.<sup>11,37,38</sup> Therefore, it is time to carry out intervention strategies to prevent violent incidents in healthcare settings; for non-emergency medical settings, interventions to prevent violence against health workers should focus on better managing violent patients and high-risk visitors; for emergency medical settings, interventions should focus on ensuring the physical security of health-care facilities.

Doctors and nurses suffering from WPV may feel angrier and more fearful than they usually do, so they need resources to cope with the negative emotions. Coping resources from individuals include self-efficacy, hope, resilience and optimism, which are called PsyCap for releasing WPV-related stress. In our study, we found that PsyCap could mediate the association between WPV and depressive symptoms among medical staff. Namely, psychological capital were protective factors against developing depressive symptoms for assaulted doctors and nurses in Chinese general hospitals. Psychological capital could effectively prevent the development of depressive symptoms, or decrease its adverse impact on mental health. The previous survey has conformed these findings.<sup>39,40</sup> Increasingly studies presented that individuals who possessed higher PsyCap may have more self-confidence to achieve the pre-set goals, to bravely embrace difficulties, and to take a positive attitude towards adversity or personal setbacks.<sup>41–43</sup> Hao et al reported a similar finding that PsyCap could attenuate the adverse impact of negative factors on depressive symptoms in medical staff.<sup>13</sup> Given the characteristics of PsyCap that it can be effectively developed and managed, intervention strategies concerning

PsyCap should be carried out to increase the level of PsyCap in both doctors and nurses to prevent depressive symptoms.

However, there are some limitations in this study. Firstly, a cross-sectional design was employed in this study, which cannot draw causal conclusions between these variables. Therefore, casual relationships should be confirmed by Longitudinal studies in the future. Secondly, self-reported questionnaires were used to collect data in the present study. Thus, recall bias could have been introduced. Finally, although this study examined the relationships between WPV, PsyCap, and depressive symptoms, some important information was not collected in this study, including the number of children and the elderly, and spouse occupation, which might influence the results. Therefore, these possible risk factors should be taken into account in further studies.

## Conclusion

Our findings revealed that both doctors and nurses had serious depressive symptoms, and more than half of them had suffered from WPV, including verbal sexual harassment or physical assault. WPV was positively associated with depressive symptoms, while PsyCap was protective factors against developing depressive symptoms. Besides, PsyCap could mediate the effect of WPV on depressive symptoms among both doctors and nurses. In other words, doctors and nurses with high levels of psychological capital are adaptable to changing demands and demonstrate emotional stability when faced with WPV. Therefore, a safer work environment and psychological capital development based on resilience, hope, self-efficacy and optimism may be considered in prevention and treatment strategies for reducing depressive symptoms.

## Ethical Approval

The study was approved by the Ethics Committee on Human Experimentation of China Medical University and complied with the Declaration of Helsinki.

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## Disclosure

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