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Abstract

Background: Moral injury (MI) not only contributes to a range of mental health problems among nurses but also diminishes their physical and psychological well-being and job satisfaction. More critically, it may erode occupational identity (OI), thereby threatening the stability of the nursing workforce and compromising the quality of patient care. Although previous studies have suggested that psychological capital (PsyCap) and perceived organisational support (POS) may be key factors in sustaining OI, the interrelationships among these four constructs within the nursing population remain insufficiently explored.

Objectives: This study aimed to analyse the factors associated with OI among nurses and to examine the chained mediating roles of PsyCap and POS in the relationship between MI and OI, as well as the moderating role of working experience.

Methods: A cross-sectional survey was conducted involving currently employed nurses from multiple tertiary (Grade III-A and III-B) and secondary (Grade II) hospitals across Sichuan, Guangdong, and Chongqing municipalities. A moderated mediation model was established using the SPSS PROCESS 3.5 macro to examine the relationships among MI, PsyCap, POS, and OI. In addition, this moderated mediation model was employed to investigate the moderating role of working experience.

Results: A total of 600 nurses completed the online survey, after data screening, 537 valid questionnaires were retained for analysis. Mediation analysis revealed that PsyCap and POS operated as chain mediators in the relationship between MI and OI, with an indirect effect of $\beta = -0.106$ (95% CI: -0.133 to -0.079), accounting for 22.18% of the total effect. When working experience was introduced as a moderator, the initial chained mediation effect remained significant. Moderation analysis further indicated that working experience positively moderated the relationship between PsyCap and POS ($\beta = 0.101$, 95% CI: 0.033 to 0.169), while negatively moderating the relationship between PsyCap and OI ($\beta = -0.069$, 95% CI: -0.133 to -0.006).

Conclusion: The present study reveals the chained mediating roles of PsyCap and POS in the relationship between MI and OI, and further identifies the moderating effect of working experience. These findings offer a novel theoretical perspective for understanding the process through which MI may lead to a decline in OI. Accordingly, to mitigate the adverse effects of MI and help nurses sustain their OI, it is advisable to cultivate supportive work environments, foster robust PsyCap, and actively encourage help-seeking behaviours, including seeking organisational support when needed.

Keywords: Moral injury, Psychological capital, Perceived organisational support, Occupational identity

Introduction

Moral injury (MI) refers to a psychological state arising from the perception that one's core values and professional duties have been violated, coupled with a sense of powerlessness to take morally congruent action[1, 2]. Such injury not only inflicts deep psychological harm and persistent distress on nurses[3], but also provokes complex and intense negative emotions, including anxiety, guilt, shame, disgust, and self-blame[4, 5], and may exert a substantial impact on the entire nursing team[6]. The concept was first introduced by psychiatrist Shay in the 1990s, who characterised it as a form of characterological trauma resulting from betrayal by leaders[7]. Jinkerson subsequently distinguished between two types of MI. Self-oriented MI, which arises from one's own actions violating personal moral beliefs, and other-oriented MI, which stems from involvement in or witnessing of cruelty perpetrated by others[8]. Among healthcare professionals, the prevalence of MI is estimated at 45%[9].

Mounting evidence indicates that MI contributes to a range of mental health problems among nurses, which may not only diminish their well-being[10, 11]and job satisfaction[12] but also impair clinical decision-making[13], compromise the quality of care[14], and adversely affect patient recovery outcomes[15]. Previous research has also indicated that the guilt and self-doubt triggered by MI may indirectly lead to a diminished sense of professional calling, through the suppression of authentic self-expression as a psychological resource, thereby gradually eroding occupational identity (OI)[16]. However, research on how to prevent MI from further evolving into a decline in OI remains relatively limited. Identifying the intervenable key links between these two constructs is of particular importance, as MI may represent a critical factor contributing to the deterioration of OI[17], and declines in OI, in turn, pose potential threats to the stability of the nursing workforce and the quality of healthcare delivery[18].

The Job Demands-Resources (JD-R) model posits that negative factors that deplete individual energy,

such as role conflict, can lead to adverse outcomes, whereas abundant job resources can generate positive outcomes by enhancing employees' work engagement. Within this theoretical framework, positive factors related to the psychological or organisational aspects of the work environment are regarded as important job resources that help to prevent adverse outcomes. Previous research also indicates that nurses' OI is influenced not only by their own psychological resources but also by external environmental factors [19]. Therefore, this study proposes that psychological capital (PsyCap) and perceived organisational support (POS) may play a key role in mitigating MI and sustaining OI. Specifically, PsyCap, as a set of positive psychological resources at the individual level, including self-efficacy, hope, optimism, and resilience, has been shown to play a significant mediating role between occupational stress and OI, helping to alleviate work-related stress and sustain OI[20]. In addition, POS, the extent to which an organisation values, respects, and cares for employees' well-being beyond its formal contributions and services, is also a significant positive predictor of professional identity[21]. When nurses encounter external adversities, POS may facilitate rapid adaptation, thereby preventing further erosion of OI. However, JD-R model does not further elucidate the interrelationship between psychological factors and perceived external support. Moreover, given that the emphasis of professional identity cultivation differs across career stages, the JD-R model also fails to specify how tailored measures for professional identity development should be implemented for nurses at different career phases. Therefore, further in-depth investigation into this issue is warranted.

The Conservation of Resources theory (COR)[22] may help to elucidate the two issues discussed above, which posits that individuals are motivated to preserve, protect, and acquire resources. These resources may be either personal internal attributes (such as PsyCap) or conditional external environmental supports (such as POS). When individuals encounter intense psychological stressors (such as MI), their internal psychological resources are directly depleted and threatened. When existing resources are actually lost, this may precipitate a stress response (i.e., a decline in OI). Notably, in the face of stressors, individuals

with greater resources are less susceptible to resource loss and possess stronger resource acquisition capabilities, thereby rendering them less prone to stress responses. Conversely, individuals with fewer resources are more vulnerable to resource depletion and demonstrate reduced capacity for resource acquisition, making them relatively more susceptible to stress responses. Based on this perspective, it is reasonable to infer that MI, as a significant psychological stressor, may lead to a decline in nurses' OI. This may be primarily because experiences of MI can deplete PsyCap. When faced with this situation, individuals with fewer PsyCap resources tend to have poorer resource acquisition capabilities, rendering them less able to perceive organisational support clearly. They are more susceptible to stress responses, which ultimately lead to a decline in OI. Therefore, PsyCap and POS are likely to play a chain mediating role in the relationship between MI and OI. Furthermore, the COS also introduces the principles of resource caravans and passageways, which posit that resources exist within specific ecological contexts (passageways), and that the quality of these passageways can either cultivate or hinder resources. Given that nurses at different career stages possess distinct professional ecological contexts, it is reasonable to infer that working experience may play a moderating role in this chain mediating pathway.

Aim of the study

Guided by the COS, this study aimed to examine the interrelationships among MI, OI, PsyCap, and POS in nurses, with the goal of identifying key strategies for intervening in MI and sustaining or enhancing OI. We hypothesised that PsyCap and POS would serve as chain mediators in the relationship between MI and OI, and working experience plays a moderating role in this regard. The conceptual model guiding this study is illustrated in **Fig 1**.

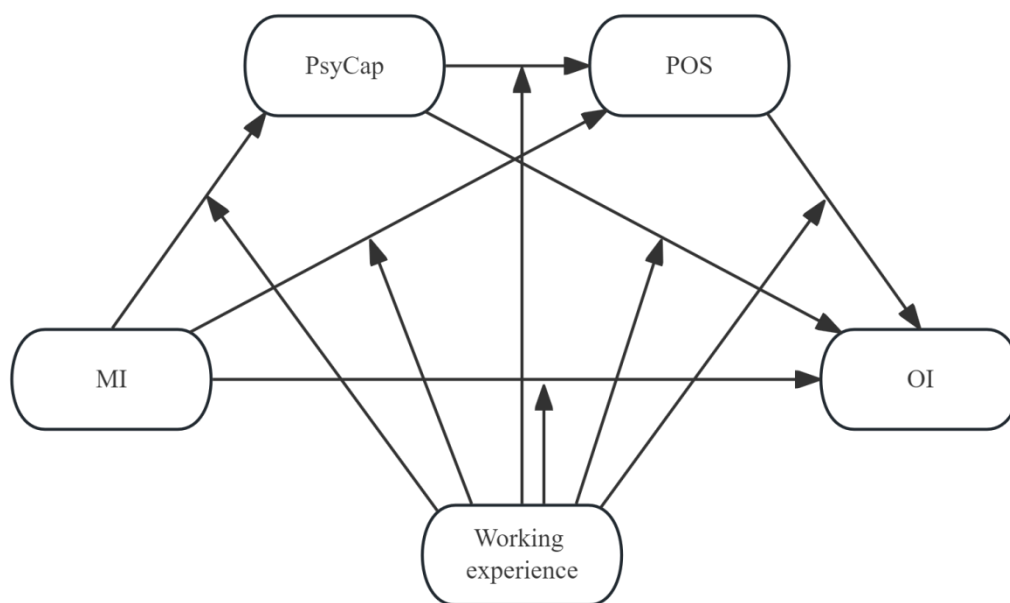


Fig 1 Research framework grounded in the Conservation of Resources theory

Methods

Sample and settings

This study employed a cross-sectional survey design. Using a convenience sampling method, a total of 600 nurses were recruited from multiple hospitals across Sichuan, Guangdong, and Chongqing municipalities in China between June 2025 and July 2025. The sample comprised currently employed nurses who met predefined inclusion and exclusion criteria, and data were collected via an online questionnaire. Participating hospitals were predominantly tertiary Grade III-A institutions, with additional recruitment from Grade III-B and Grade II hospitals. Inclusion criteria were: (1) age 18 years or older, (2) currently registered as a nurse, and (3) voluntary participation. Exclusion criteria were: (1) nurses with a history of, or current, severe mental illness, (2) nurses on extended leave during the study period, such as maternity leave, long-term sick leave, or full-time study leave. All potential participants completed a demographic questionnaire. Submitted questionnaires were screened, and those from individuals not meeting all inclusion criteria were excluded from analysis.

Investigation procedures

An online survey was developed and administered using the Questionnaire Star platform (www.wjx.cn). The questionnaire link was distributed via online channels to nurses, who completed the survey independently. All responses were collected in a fully anonymous manner, with no recording of nurses' names or other key personal identifiers. To prevent duplicate submissions from the same participant, the system was configured to permit only one response per device. The questionnaire comprised three sections: a description of the study's purpose and procedures, an informed consent form, and the formal measurement scales. All questionnaires were distributed electronically via the social media application WeChat, with participants requested to complete them within one week. The platform was further configured to require respondents to spend a minimum of 30 seconds reading the participant information sheet and to provide electronic informed consent before accessing the survey items.

The required sample size was calculated using the formula for estimating a population proportion: $N = (U^2_{1-\alpha/2} \times P_0(1-P_0)) / d^2$, where N is the sample size, U is the standard normal deviate corresponding to the confidence level, α is the significance level set at 0.05, and P_0 is the estimated population proportion. Based on previous studies on OI among healthcare workers, P_0 was set at 0.71[23]. With an allowable error (d) of 0.05, the minimum required sample size was 314. Accounting for a potential 10-20% non-response rate, the target sample size was adjusted to 349-393.

To ensure the authenticity and reliability of the questionnaire data, a series of rigorous quality control measures were implemented. During the completion phase, the following criteria were applied: (1) a minimum completion time of five minutes was enforced, (2) questionnaires with identical response patterns were excluded, (3) incomplete questionnaires were discarded, and (4) respondents who provided diametrically opposite answers to similar items were also removed. Only questionnaires that satisfied all of

the above criteria were included in the final analysis.

Following data collection, systematic data cleaning procedures were performed, including: (1) range and logic checks: values outside plausible ranges (e.g., age < 18 years) or exhibiting logical inconsistencies (e.g., years of experience exceeding age) were verified against original records where possible, corrected, or treated as missing, (2) outlier handling: statistical outliers were evaluated for clinical plausibility, those identified as data entry errors were corrected or set to missing, and (3) missing data handling: for continuous variables with low rates of missingness, mean imputation was used, for categorical variables, a distinct 'missing' category was created. No critical variables contained missing data in the final analytic sample. Following these procedures, the final analytic sample comprised 537 valid responses, which met the prespecified sample size requirement. The questionnaire sampling and screening process is summarised in **Fig 2.**



Fig 2 Flowchart of the questionnaire sampling and screening process

Measures

Demographic characteristics questionnaires

Data on demographic and professional characteristics were collected using a study specific questionnaire.

This instrument captured participants' demographic and professional information, including gender, age, working experience, education level, professional title, and department.

Survey of Perceived Organizational Support

POS was measured using the Survey of Perceived Organizational Support (SPOS), originally developed by Chen et al. based on empirical research and subsequently revised by Pan et al. to suit the professional characteristics of healthcare workers[24]. The scale comprises two dimensions: emotional support and instrumental support. Emotional support refers to the encouragement and affirmation provided by the organisation to employees, encompassing intimacy support, respect support, and network integration support. Instrumental support represents the tangible resources, such as information, tools, and equipment, that the organisation offers to facilitate task completion. The scale contains 14 items, each rated on a 5-point Likert scale ranging from 1 (very inconsistent) to 5 (very consistent). Total scores range from 14 to 70, with higher scores indicating greater POS. In this study, the Cronbach's α coefficient for the scale was 0.964.

Psychological Capital Questionnaire

PsyCap was measured using the Psychological Capital Questionnaire (PCQ), originally developed by Luthans[25]. This instrument comprises 24 items distributed across four dimensions, include self-efficacy, hope, resilience, and optimism. Each item is rated on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree), yielding total scores between 24 and 144. Higher total scores indicate greater levels of PsyCap. The Chinese version of the PCQ has demonstrated satisfactory reliability and validity in prior studies. In the present study, the Cronbach's α coefficient for the scale was 0.958.

Occupational Identity Scale

OI was assessed using the Occupational Identity Scale (OIS), originally developed by Tyler and McCallum[26]. The scale comprises 10 items, each rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Total scores range from 10 to 50, with higher scores indicating a stronger

sense of OI. In the present study, the Cronbach's α coefficient for this scale was 0.951.

Moral Injury Symptoms Scale Health Professionals Version

MI was measured using the Moral Injury Symptoms Scale for Health Professionals (MISS-HP), originally developed by Mantri et al. in 2020 to assess moral injury specifically among healthcare professionals[27]. The scale was subsequently culturally adapted into Chinese by Wang et al. to facilitate investigation of MI among healthcare workers in China[28]. The Chinese version comprises 10 items distributed across three dimensions, include shame and guilt, distrust, and forgiveness. Items 5, 6, 7, and 10 are reverse-scored. Each item is rated on a 10-point scale ranging from 1 (strongly disagree) to 10 (strongly agree), yielding total scores between 10 and 100. Higher scores indicate greater severity of MI. In the present study, the Cronbach's α coefficient for this scale was 0.706.

Ethics consideration

This study was conducted in accordance with the principles of the Declaration of Helsinki and received approval from the Ethics Committee of west China hospital, Sichuan university (No. 1581). All participants were informed about all the details of this study and agreed to participate in this survey.

Statistical analysis

Statistical analyses were performed using SPSS 26.0 and the PROCESS 3.5 macro for SPSS. To evaluate common method bias, a Harman single-factor test was conducted. And continuous variables following a normal distribution are presented as mean $\pm$ standard deviation (SD), whereas non-normally distributed continuous variables are reported as median and interquartile range (IQR). Categorical variables are described using frequencies and constituent ratios. For between-group comparisons, the independent-samples t-test or one-way analysis of variance (ANOVA) was used when the dependent

variable was normally distributed. Otherwise, non-parametric tests for two or more independent samples were applied. Pearson correlation coefficients were computed to assess associations between continuous variables when normally distributed, and Spearman's rank-order correlation was employed for non-normally distributed data.

Based on the results of the non-parametric tests and correlation analyses, variables that were statistically significant were entered as independent variables into a stepwise forward multiple linear regression model, with OI as the dependent variable, to identify factors influence OI. After controlling for demographic variables, we examined the chain mediating role of PsyCap and POS in the relationship between MI and OI using the PROCESS macro (Model 6) in SPSS, and investigated the moderating role of working experience using Model 92. The mediation and moderation models were tested using the bias-corrected bootstrap method with 5000 resamples to assess the significance of the effects, and 95% confidence intervals were computed. A two-tailed p -value < 0.05 was considered statistically significant for all analyses.

Results

Demographic characteristics

A total of 537 valid questionnaires were included in the final analysis. The study sample was predominantly female ($n = 501$, 93.3%), 86% of participants held a bachelor's degree or higher, and 43.8% held middle or above professional titles. Non-parametric tests were employed to compare professional identity scores across different demographic categories. The results revealed no significant differences in professional identity scores by gender ($Z = -0.016$, $p = 0.987$), education level ($Z = 4.002$, $p = 0.135$), professional title ($Z = 2.739$, $p = 0.434$), or department ($Z = 7.010$, $p = 0.536$). Detailed results are presented in **Table 1**.

Table 1 Demographic characteristics of the study subjects (N=537)

Variables	N (%)	H (Z)	p
Gender		-0.016	0.987
Female	501 (93.3)		
Male	36 (6.7)		
Education level		4.002	0.135
Below bachelor's degree	75 (14)		
Bachelor	439 (81.7)		
Master's degree or higher	23 (4.3)		
Professional title		2.739	0.434
Primary	302 (56.2)		
Middle	80 (14.9)		
Associate Senior	67 (12.5)		
Senior	88 (16.4)		
Department		7.010	0.536
Internal Medicine	124 (23.1)		
Surgery	148 (27.6)		
Obstetrics and Gynaecology	30 (5.6)		
Paediatrics	30 (5.6)		
Emergency	21 (3.9)		
Critical Care	41 (7.6)		
Psychiatry	42 (7.8)		
Operating Theatre	16 (3)		

Others 85 (15.8)

^ap-values derived from Mann-Whitney U (binary), Kruskal-Wallis H (multi-category).

Correlations among the major variables

The median score was 34 (IQR: 29-39) for age, 12 (IQR: 6-17) for working experience, 56 (IQR: 52-67) for POS, 39 (IQR: 33-46) for OI, 111 (IQR: 97-122) for PsyCap, and 43 (IQR: 33-51) for MI. And the Spearman's correlation analysis revealed that OI was negatively correlated with MI, and positively correlated with PsyCap, POS, and working experience. Detailed results are presented in **Table 2**.

Table 2 The correlations among the continuous variables by Spearman's Correlation (N=537)

Variable	Median (IQR)	Age	Working experience	POS	OI	PsyCap	MI
Age	34(29-39)	1					
Working experience	12(6-17)	0.958**	1				
POS	56(52-67)	0.011	0.04	1			
OI	39(33-46)	0.081	0.119**	0.817**	1		
PsyCap	111(97-122)	0.091*	0.121**	0.713**	0.800**	1	
MI	43(33-51)	-0.177**	-0.190**	-0.466**	-0.460**	-0.358**	1

^aBold values indicate statistically significant associations (*p < 0.05, **p < 0.01).

Multiple linear regression

Continuous variables were standardised using z-scores. The results indicated that POS ($\beta = 0.461$, 95% CI: 0.398 to 0.523), PsyCap ($\beta = 0.421$, 95% CI: 0.361 to 0.480), and working experience ($\beta = 0.073$, 95% CI: 0.030 to 0.115) all had a significant positive effect on OI, whilst MI ($\beta = -0.098$, 95% CI: -0.146 to -0.051) had a significant negative effect on OI. Detailed results are presented in **Table 3**.

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Table 3 Multiple linear regression analysis of factors influencing OI (N = 537).

Variable	B	β	t	p-value	LLCI	ULCI	VIF
POS	0.461	0.461	14.454	***	0.398	0.523	2.281
PsyCap	0.421	0.421	13.903	***	0.361	0.480	2.057
MI	-0.098	-0.098	-4.032	***	-0.146	-0.051	1.339
Working experience	0.073	0.073	3.346	**	0.030	0.115	1.060

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a.**p <0.01, ***p<0.001

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Mediating effects of PsyCap and POS

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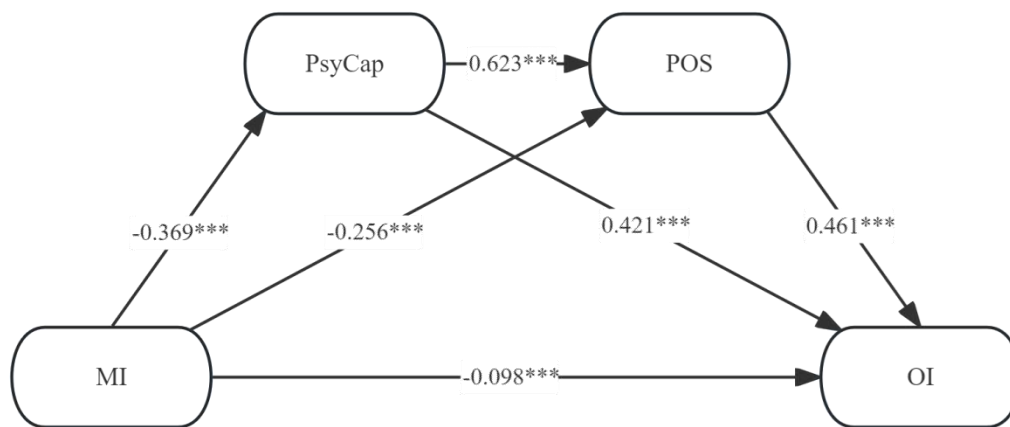
The results of mediation analysis showed that the total effect of MI on OI was $\beta = -0.478$ (95% CI: -0.553 to -0.403). This total effect was decomposed into a direct effect ($\beta = -0.098$, 95% CI: -0.146 to -0.051), accounting for 20.5% of the total effect, and an indirect effect ($\beta = -0.379$, 95% CI: -0.440 to -0.318), accounting for 79.5%.

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Within the indirect pathways, three significant mediating effects were identified. First, PsyCap independently mediated the relationship between MI and OI ($\beta = -0.155$, 95% CI: -0.199 to -0.115), explaining 32.43% of the total effect. Second, POS independently mediated this relationship ($\beta = -0.118$, 95% CI: -0.155 to -0.084), explaining 24.69% of the total effect. Third, PsyCap and POS operated as chain mediators in the pathway from M to OI ($\beta = -0.106$, 95% CI: -0.133 to -0.079), explaining 22.18% of the total effect. The 95% confidence intervals for all direct and indirect effects did not include zero, indicating that all pathway effects were statistically significant. These findings are consistent with the study hypotheses. Detailed results are presented in **Table 4** and illustrated in **Fig 3**.

Table 4 Chain mediating effects of PsyCap and POS on the relationship between MI and OI (N = 537)

Path	Effect	BootSE	LLCI	ULCI	Percentage (%)
Total effect	-0.478	0.038	-0.553	-0.403	-
Direct effect (MI→OI)	-0.098	0.024	-0.146	-0.051	20.50
Indirect effect	-0.379	0.031	-0.440	-0.318	79.50
MI→PsyCap→OI	-0.155	0.021	-0.199	-0.115	32.43
MI→POS→OI	-0.118	0.018	-0.155	-0.084	24.69
MI→PsyCap→POS→OI	-0.106	0.013	-0.133	-0.079	22.18



a.**p <0.01, ***p<0.001

Fig 3 Path diagram of the chained mediating effects of PsyCap and POS**Moderating effect of working experience**

The results of the moderated chain mediation analysis showed that in the equation with PsyCap as the

outcome variable, MI explained 15.0% of its variance ($R^2 = 0.150$, $F = 31.321$, $p < 0.001$). In the equation

with POS as the outcome variable, MI, PsyCap, and their interaction term jointly explained 56.9% of its

variance ($R^2 = 0.569$, $F = 139.968$, $p < 0.001$). In the equation with OI as the outcome variable, all predictors

284 and the interaction term collectively explained 77.4% of its variance ($R^2 = 0.774$, $F = 258.858$, $p < 0.001$).
285 The results showed that the chain mediation effect significant. Detailed results are presented in **Table 5** and
286 **Fig 4**.

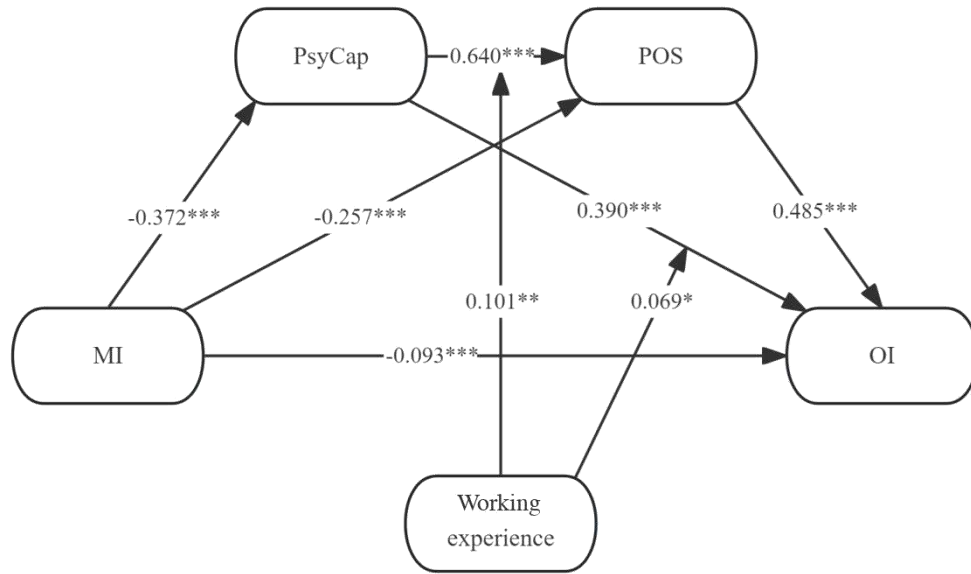
287 **Table 5** Analysis of the chain mediating effects of PsyCap and POS under the moderating influence of working experience
288 (N = 537)

Path	Effect	BootSE	LLCI	ULCI	Percentage (%)
Direct effect (MI→OI)	-0.093	0.024	-0.141	-0.046	19.46
Indirect effect					
MI→PsyCap→OI	-0.145	0.020	-0.186	-0.107	30.33
MI→POS→OI	-0.125	0.019	-0.165	-0.089	26.15
MI→PsyCap→POS→OI	-0.115	0.016	-0.148	-0.086	24.06

289 And working experience not only moderated the relationship between PsyCap and POS ($\beta = 0.101$, 95%
290 CI: 0.033 to 0.169) but also moderated the relationship between PsyCap and OI ($\beta = -0.069$, 95% CI: -0.133
291 to -0.006). Detailed results are presented in **Table 6** and **Fig 4**.

292 **Table 6** Analysis of the moderating effects of working experience (N = 537)

Independent variable	Dependent variable: POS				Dependent variable:OI			
	Effect	BootSE	LLCI	ULCI	Effect	BootSE	LLCI	ULCI
Working experience	-0.117	0.029	-0.174	-0.059	0.077	0.022	0.034	0.120
PsyCap * Working experience	0.101	0.034	0.033	0.169	-0.069	0.032	-0.133	-0.006



a.**p <0.01, ***p<0.001

Fig 4 Path diagram of the chain mediating effects of PsyCap and POS, moderated by working experience

Using the mean $\pm$ 1 SD grouping method, working experience was categorised into high and low levels.

Simple slope analysis tables and plots were then generated to further examine the moderating trends of working experience on the direct pathways between PsyCap and POS, and between PsyCap and OI. The results showed that the low working experience group, PsyCap had a significant positive effect on POS (simple slope = 0.539, $t = 12.727$, $p < 0.001$). In the high working experience group, PsyCap also had a significant positive effect on POS, and this effect was stronger than that in the low group (simple slope = 0.742, $t = 14.659$, $p < 0.001$). Thus, working experience acted as an enhancing moderator on this pathway. Detailed results are presented in **Table 7** and **Fig 5**.

Table 7 Analysis of the moderating effect of working experience on the relationship between PsyCap and POS (N = 537)

Working experience	Effect	BootSE	t	p	LLCI	ULCI
M-1SD (Low Working experience)	0.539	0.042	12.727	<0.001	0.456	0.622
M (Mean)	0.640	0.031	20.388	<0.001	0.579	0.702

M+1SD (High Working experience)	0.742	0.051	14.659	<0.001	0.342	0.841
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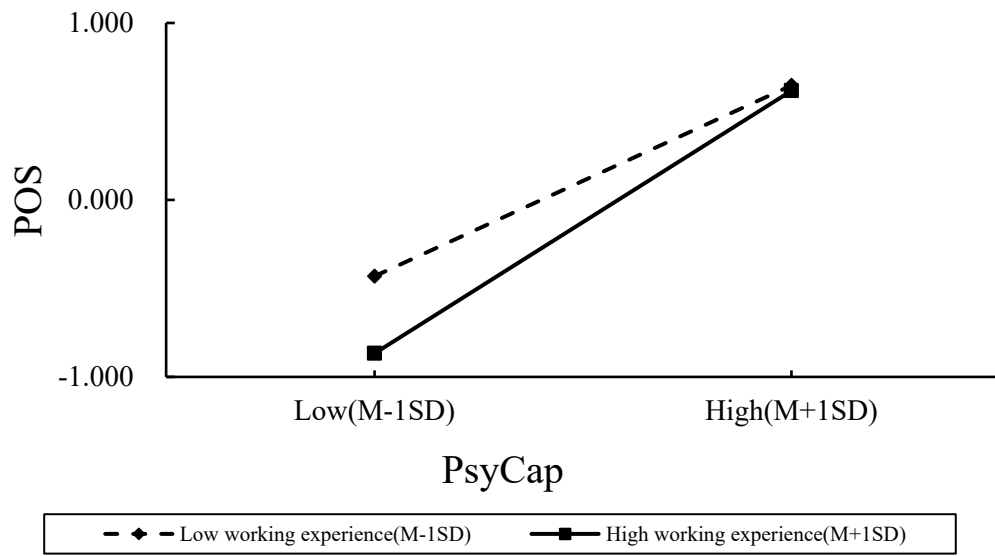


Fig 5 Moderating effect of working experience on the relationship between PsyCap and POS

Furthermore, in the low working experience group, PsyCap had a significant positive effect on OI (simple slope = 0.460, $t = 11.386$, $p < 0.001$). This positive effect was also present in the high working experience group; however, the effect was weaker compared with that in the low working experience group (simple slope = 0.321, $t = 6.646$, $p < 0.001$). Thus, working experience acted as a weakening moderator on this pathway. Detailed results are presented in **Table 8** and **Fig 6**.

Table 8 Analysis of the moderating effect of working experience on the relationship between PsyCap and OI (N = 537)

Working experience	Effect	BootSE	t	p	LLCI	ULCI
M-1SD (Low Working experience)	0.460	0.040	11.386	<0.001	0.380	0.539
M (Mean)	0.390	0.030	12.829	<0.001	0.330	0.450
M+1SD (High Working experience)	0.321	0.048	6.646	<0.001	0.226	0.415

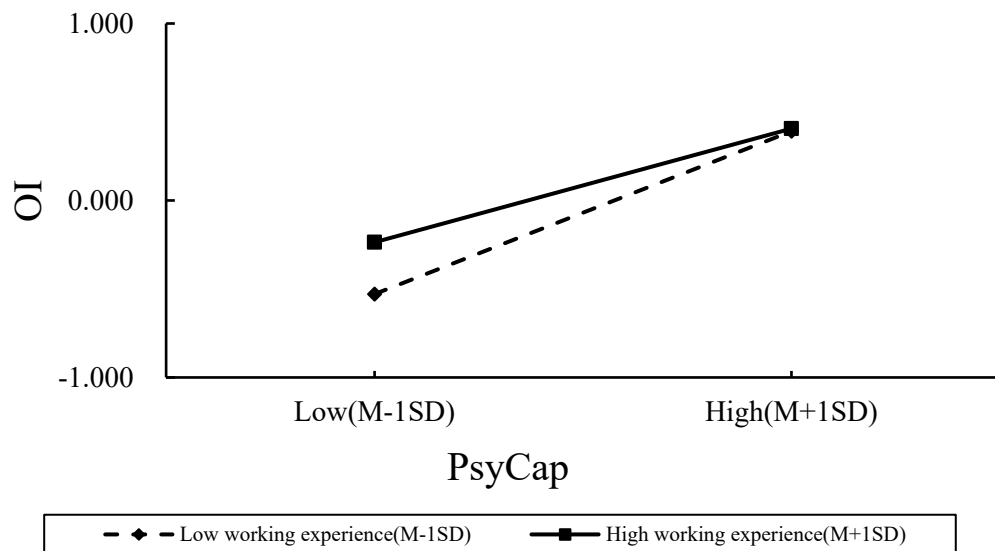


Fig 6 Moderating effect of working experience on the relationship between PsyCap and OI

Discussion

Regression analysis demonstrated that PsyCap, POS, MI, and working experience are significant effects of OI among nurses. Mediation analysis further revealed that PsyCap and POS exerted a significant chain mediating effect in the relationship between MI and OI. In addition, moderation analysis indicated that working experience played a moderating role in this pathway. Specifically, working experience acted as an enhancing moderator between PsyCap and POS, while serving as a weakening moderator between PsyCap and OI, as illustrated in **Fig 5**.

Factors impacting OI among nurses

Working experience had a positive impact on nurses' OI, a finding consistent with previous research[29]. Moreover, the formation mechanisms of OI differ across career stages. Novice nurses tend to derive their OI primarily from external support, role modelling, and managerial humanistic care, which renders them more susceptible to environmental shocks. In contrast, experienced nurses' OI is more firmly rooted in the accumulation of personal experience and achievements, thereby exhibiting greater stability and durability[30,

31]. Consequently, nurses with more extensive working experience tend to possess higher levels of OI.

Both PsyCap[32, 33] and POS exerted significant positive effects on OI. PsyCap encompasses four dimensions, including self-efficacy, hope, optimism, and resilience. Nurses with high self-efficacy tend to adopt more positive career attitudes and demonstrate greater competence in meeting challenges[34]. Those with high hope maintain clear career plans and positive professional visions, making them more likely to perceive professional growth[35]. Optimistic nurses sustain positive cognitive appraisals, while those with strong resilience exhibit enhanced capacity to withstand setbacks. These attributes are all pivotal to sustaining OI. POS comprises instrumental support and emotional support. Emotional support, including attentive listening, care, and respect, strengthens nurses' sense of belonging and facilitates their identification with their work, which may further evolve into OI[36, 37]. Instrumental support, such as training, environmental improvements, and promotion opportunities, plays an indispensable role in fostering OI by helping nurses navigate difficulties, reducing negative emotions, and fulfilling expectations for career advancement[38]. Previous research has also demonstrated that employees who perceive greater organisational support tend to respond with stronger OI[39].

In addition, the present study confirmed that MI exerts a negative impact on OI, such that higher levels of MI are associated with lower OI. This relationship has rarely been demonstrated in previous research, and the underlying mechanisms remain largely unexplored. MI often originates from discrepancies between individual values and behaviours. When the ideal self conflicts with perceived imperfections in reality, and when one's career ceases to serve as a source of self-fulfilment and self-achievement, identification with that profession naturally declines. Moreover, MI is frequently accompanied by the cumulative burden of negative emotions, including guilt, shame, loss of meaning, and self-condemnation. Which not only impair nurses' work performance but may also become psychologically linked to their professional role. When the value derived from one's profession is perceived as predominantly negative, OI gradually erodes[40]. Furthermore,

MI is often associated with what nurses perceive as suboptimal work performance. Such perceived failures to meet their own standards may lead nurses to attribute these shortcomings to personal incompetence, potentially contributing to a decline in work engagement and, ultimately, to a reduction in OI[41].

The chain mediating role of PsyCap and POS

Through mediation analysis, the present study demonstrated that PsyCap and POS played a significant chain mediating role between MI and OI. On the one hand, PsyCap independently mediated the relationship between MI and OI. This is consistent with the COS, which posits that when actual resource loss occurs, psychological distress ensues, and individuals utilise their key resources to cope with stressful situations in their environment. When individuals experience MI as a stressor, PsyCap, which functions as a personal characteristics resources, becomes eroded. When such personal resources are depleted, individuals may enter a defensive mode, manifested as withdrawal and a consequent decline in OI. Furthermore, PsyCap serves not only as a psychological resource for coping with injury but also as a critical factor in constructing nurses' OI. When nurses experience MI characterised by negative emotions such as guilt, loss of meaning, and self-condemnation, their levels of self-efficacy, hope, and optimism tend to decline[42, 43]. These internal psychological resources are not only integral components of PsyCap but also essential elements for sustaining and cultivating OI[44]. When MI depletes PsyCap, the psychological resources available for constructing OI become diminished, and OI naturally declines. This explains why PsyCap functions as a mediator in the relationship between MI and OI. The strength of PsyCap, to a certain extent, determines how such depletion affects OI. On the other hand, POS independently mediated the relationship between MI and OI. The Conservation of Resources theory posits that MI, as a resource-damaging event, erodes nurses' conditions resources, particularly their trust in and sense of belonging to the organisational environment. For instance, when nurses encounter MI and perceive that the organisation fails to provide substantive support,

or even believe that institutional constraints prevent them from acting in accordance with ethical standards, they may develop a strong sense of organisational betrayal. This leads nurses to recognise that the organisational environment on which they rely is unreliable, resulting in a marked decline in their perceived organisational support[45]. The resource investment principle of the COS further posits that when individuals invest resources without receiving the expected returns, they experience more intense psychological distress than from resource loss alone. Consequently, when nurses invest considerable emotion, time, and effort in their work yet perceive diminishing organisational support, they tend to adopt stronger defensive withdrawal strategies and reduce work engagement to conserve remaining resources. This ultimately manifests as a decline in professional identity. Conversely, when employees perceive the organisation as a solid foundation of support, they are more likely to view unavoidable ethical dilemmas as shared challenges to be tackled collectively. When nurses believe they are "on the same side" as their organisation, this sense of belonging becomes pivotal to sustaining and strengthening OI[46]. This explains why POS also plays an important mediating role in the relationship between MI and OI.

The present study also confirmed the chain mediating role of PsyCap and POS in the relationship between MI and OI. This finding is consistent with the COS, which posits that when faced with stressors, individuals with greater resources are less susceptible to resource loss and possess stronger resource acquisition capabilities, thereby rendering them less prone to stress responses. Conversely, individuals with fewer resources are more vulnerable to resource depletion, exhibit reduced capacity for resource acquisition, and are consequently more likely to experience stress responses. Accordingly, the occurrence of MI depletes nurses' internal PsyCap, and lower PsyCap diminishes their ability to acquire resources, predisposing them to view the organisation negatively, thereby reducing POS and ultimately undermining their OI. Conversely, nurses with richer PsyCap tend to perceive higher organisational support[47, 48]. When confronted with the impact of MI, they are more inclined to interpret organisational behaviours positively and optimistically[49].

Optimism and hope predispose them to attend to supportive signals from the organisation. Nurses with high self-efficacy hold more positive career attitudes and are therefore more likely to receive feedback and support from the organisation[34]. Resilience makes them more proactive and open in interpersonal interactions, enabling them to actively connect with colleagues and supervisors, thereby gaining more practical support and feedback[50]. These factors collectively enhance their POS, buffer against the negative effects of MI, and help sustain their OI.

Notably, PsyCap and organisational support engage in a mutually reinforcing positive cycle. Higher levels of PsyCap predisposes nurses to seek and obtain organisational support, while greater POS, in turn, further enhances PsyCap. Together, they form a bidirectional positive feedback loop that sustains nurses' OI. In summary, PsyCap and POS not only function as independent mediators in the relationship between MI and OI but also act synergistically as critical conditions for maintaining OI.

Moderating role of working experience

Moderation analysis revealed that working experience acted as an enhancing moderator in the relationship between PsyCap and POS. On the one hand, the resource caravan and passageway principles suggest that resources exist within specific ecological contexts, and that the quality of these passageways directly influences the maintenance and growth of resources. And senior nurses possess richer PsyCap and their personal characteristics resources are already relatively abundant[51]. Therefore, for this group, whether the organisation provides sufficient support, such as establishing equitable career pathways and recognising nurses' contributions, becomes a critical external condition for determining whether their resources can continue to appreciate. On the other hand, senior nurses possess richer workplace social capital, characterised by more stable interpersonal networks, which helps alleviate psychological distress and reinforces their identification with and trust in the organisation[52]. Moreover, senior nurses have clearer

pathways for accessing organisational support and more established experience in organisational interactions. When they also possess richer PsyCap, they are more adept at translating internal positive psychological resources into external organisational support through existing social relationships. This is also more conducive to supporting its POS. In contrast, junior nurses may have less stable interpersonal networks; even when they exhibit high levels of PsyCap, they may encounter greater difficulty in obtaining organisational support. Additionally, they may lack relevant training, fail to fully appreciate the importance of organisational support, or even be reluctant to seek help due to feelings of shame. These factors explain the potential enhancing moderating effect of working experience on the relationship between PsyCap and POS.

At the same time, working experience acted as a weakening moderator in the relationship between PsyCap and OI. This result may be attributed to differences in the construction of OI across career stages. For junior nurses, OI is primarily built upon external support, successful practical experiences, and the establishment of a sense of belonging[30, 31]. PsyCap serves as an important resource for cultivating this sense of belonging[53], rendering OI development highly dependent on PsyCap during this stage. In contrast, senior nurses have already established stable interpersonal networks and a strong sense of belonging; their OI is more firmly grounded in internal growth and long-term experience[31], shaped by professional achievements, social recognition, and internalised self-worth. As a result, their OI is more structurally stabilised, and the contribution of PsyCap to further enhancing their identity is limited. Furthermore, the law of diminishing marginal utility states that, holding other conditions constant, as the stock of a given resource continues to increase, the incremental gain in satisfaction derived from each additional unit gradually diminishes. Therefore, for junior nurses whose PsyCap is still in an accumulative phase, the development of their PsyCap is likely to be accompanied by a substantial increase in OI. By contrast, for senior nurses whose PsyCap has already reached a relatively high level, further enhancement of PsyCap tends to yield

progressively smaller gains in OI. This principle further explains why working experience serves as a weakening moderator in the relationship between PsyCap and OI.

Implications

The present study confirmed the chain mediating effect of PsyCap and POS in the relationship between MI and OI, as well as the moderating role of working experience. These findings offer a theoretical perspective for understanding how experiences of MI may develop into a decline in OI, and provide a theoretical basis for the development of targeted interventions. Maintaining nurses' OI is a crucial prerequisite for ensuring workforce stability and safeguarding the quality of nursing care. Therefore, healthcare institutions should optimise policies, resource allocation, and organisational culture at the systemic level to prevent MI at its source. Nurse managers may integrate PsyCap interventions into routine training programmes, foster a positive practice environment, and provide nurses with adequate listening, empathy, and care, thereby making emotional support a key source of OI. Nurses themselves should consciously cultivate their PsyCap, utilising approaches such as mindfulness[54] to regulate effectively and avoid the continuous depletion of PsyCap by MI. When faced with MI, they should actively seek organisational support as a buffer against its impact. In addition, nurses should strive to develop moral courage and moral resilience to enhance their capacity to cope with MI[55].

This study further revealed that working experience exerts differentiated moderating effects on the relationships between PsyCap and POS, and between PsyCap and OI. Therefore, OI cultivation strategies should be differentiated according to nurses' career stages. working experience serves as a weakening moderator in the relationship between PsyCap and OI, indicating that PsyCap has a relatively high marginal utility for enhancing OI. For junior nurses with relatively underdeveloped PsyCap, actively cultivating their PsyCap is more conducive to the construction of OI. Consequently, for junior nurses with less working

experience, the cultivation focus should be placed on enriching and strengthening PsyCap. In contrast, senior nurses possess more abundant PsyCap, and the direct marginal utility of further PsyCap enhancement for improving OI has already begun to diminish. If the focus continues to be placed on PsyCap cultivation, the incremental gains would be limited. Therefore, their OI cultivation should place greater emphasis on strengthening organisational support.

Furthermore, working experience serves as an enhancing moderator in the relationship between PsyCap and POS, indicating that junior nurses have a relatively weaker capacity to translate PsyCap into perceived organisational support. Even if the organisation merely increases supportive measures, they may be unable to effectively perceive them due to limited personal capabilities or low willingness to seek help. This further explains why PsyCap cultivation is particularly critical for junior nurses, as enhanced PsyCap helps improve their receptivity to organisational support. In contrast, senior nurses possess a stronger capacity to translate PsyCap into perceived organisational support. As long as the organisation provides appropriate supportive signals, they can leverage their extensive working experience to maximise the utilisation of available support, thereby stabilising OI through the mediating pathway of organisational support. This further indicates that, for more experienced senior nurses, strengthening organisational support is more conducive to maintaining their OI.

It is noteworthy that junior nurses are more susceptible to psychological trauma during the early stages of their careers, yet their PsyCap remains underdeveloped, and the organisational support available to them is relatively limited[56]. Therefore, it is necessary to consolidate the foundation of their OI through measures such as strengthening practical guidance, providing role modelling[31], and establishing accessible support channels. Concurrently, interventions such as mindfulness-based interventions should be employed to enhance their PsyCap[54]. For senior nurses, emphasis should be placed on strengthening external resource support, including clarifying career development pathways, ensuring professional autonomy,

encouraging them to undertake research and teaching responsibilities, and improving incentive mechanisms. These measures can help senior nurses genuinely perceive their professional value, thereby facilitating their experience of organisational support. Furthermore, their OI can be further reinforced by highlighting their professional strengths in clinical practice, problem-solving abilities, and collaborative skills[31].

Strengths and limitations

Several limitations of this study warrant consideration. First, the analysis focused solely on the mediating effects of PsyCap and POS, without incorporating other potentially influential variables, such as personality traits and workload, that may shape OI among nurses. Second, the use of convenience sampling, confined to healthcare institutions in selected regions, limits the representativeness and generalisability of the findings; future research employing multi-centre, large-sample designs is needed to validate and extend these results. Third, the cross-sectional design precludes observation of the dynamic processes through which MI influences OI over time, thereby restricting causal inference. Fourth, all variables were derived from self-reported data, raising the possibility of common method bias, which may have inflated the observed associations between constructs. In addition, retrospective self-reporting is susceptible to recall bias; for sensitive and potentially stigmatising events such as MI, participants may underreport exposure frequency and severity due to selective forgetting or social desirability concerns.

Conclusions

Mediation analysis confirmed that PsyCap and POS serve as chain mediators in the relationship between MI and OI. Furthermore, moderation analysis revealed that working experience significantly moderated this process. On the basis of these findings, we recommend that healthcare institutions prioritise the development of supportive practice environments to prevent MI at its source, whilst also designing differentiated OI

cultivation programmes tailored to nurses at different career stages. Nurse managers should actively facilitate the development of PsyCap among nursing staff and provide adequate humanistic support. At the individual level, nurses themselves are encouraged to proactively enrich their psychological resources and seek organisational support when encountering MI. Such multi-level intervention strategies are essential for strengthening nurses' resilience to MI, safeguarding their mental health, ensuring workforce stability, and ultimately enhancing the quality of nursing care.

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Authors' contributions

XH and NL developed the statistical framework for data analysis, conducted the statistical analysis, interpreted the data and drafted the manuscript. TY, LH and SQW participated in the formulation of the research design and analytical framework. YW were involved in the study design, interpretation of the data, development of the statistical framework and reviewed the manuscript. All authors read and approved the final manuscript.

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Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

The study was approved by the Ethics Committee of West China Hospital, Sichuan University (No. 1581). All participants

were informed about all the details of this study and agreed to participate in this survey. Informed consent of all the participants were obtained. All methods were carried out in accordance with Declaration of Helsinki.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Reference

1. Glad KA, Wøien H, Stensland S, Reitan SK, Zwart JAH, Atar D, Dyb G, Bondjers K: **Health care workers' qualitative descriptions of ethically challenging situations evoking moral distress during Covid-19.** *Nurs Ethics* 2024;9697330241257567.
2. Goldberg DG, Soylu T, Hoffman CF, Kishton RE, Cronholm PF: **"Anxiety, COVID, Burnout and Now Depression": a Qualitative Study of Primary Care Clinicians' Perceptions of Burnout.** *J Gen Intern Med* 2024, **39**(8):1317-1323.
3. Miller PH, Epstein EG, Smith TB, Welch TD, Smith M, Bail JR: **Critical care nurse leaders addressing moral distress: A qualitative study.** *Nurs Crit Care* 2024.
4. Dehkordi LM, Kianian T, Nasrabadi AN: **Nursing students' experience of moral distress in clinical settings: A phenomenological study.** *Nurs Open* 2024, **11**(3):e2141.
5. Beck CT: **Secondary Qualitative Analysis of Moral Injury in Obstetric and Neonatal Nurses.** *J Obstet Gynecol Neonatal Nurs* 2022, **51**(2):166-176.
6. Hudgins K: **When Life-Supporting Interventions Lead to Moral Distress.** *Crit Care Nurs Q* 2024, **47**(3):218-222.
7. Shay J: **Achilles in Vietnam: Combat trauma and the undoing of character.** New York, NY, US: Atheneum Publishers/Macmillan Publishing Co; 1994.
8. Jinkerson J: **Defining and Assessing Moral Injury: A Syndrome Perspective.** *Traumatology* 2016, **22**:122-130.

9. Brennan CJ, Roberts C, Cole JC: **Prevalence of occupational moral injury and post-traumatic embitterment disorder: a systematic review and meta-analysis.** *BMJ Open* 2024, **14**(2):e071776.
10. Wang Z, Koenig HG, Tong Y, Wen J, Sui M, Liu H, Zaben FA, Liu G: **Moral injury in Chinese health professionals during the COVID-19 pandemic.** *Psychol Trauma* 2022, **14**(2):250-257.
11. Denham F, Varese F, Hurley M, Allsopp K: **Exploring experiences of moral injury and distress among health care workers during the Covid-19 pandemic.** *Psychol Psychother* 2023, **96**(4):833-848.
12. Tao H, Nieuwsma JA, Meador KG, Harris SL, Robinson PS: **Validation of the Moral Injury Outcome Scale in acute care nurses.** *Front Psychiatry* 2023, **14**:1279255.
13. Rabin S, Kika N, Lamb D, Murphy D, Am Stevelink S, Williamson V, Wessely S, Greenberg N: **Moral Injuries in Healthcare Workers: What Causes Them and What to Do About Them?** *J Healthc Leadersh* 2023, **15**:153-160.
14. Sherman M, Klinenberg E: **Beyond burnout: Moral suffering among healthcare workers in the first COVID-19 surge.** *Soc Sci Med* 2024, **340**:116471.
15. Thibodeau PS, Nash A, Greenfield JC, Bellamy JL: **The Association of Moral Injury and Healthcare Clinicians' Wellbeing: A Systematic Review.** *Int J Environ Res Public Health* 2023, **20**(13).
16. Li F, Sun L, Jia F: **The impact of moral injury on healthcare workers' career calling: exploring authentic self-expression, ethical leadership, and self-compassion.** *BMC medical ethics* 2025, **26**(1):18.
17. Peng M, Saito S, Guan H, Ma X: **Moral distress, moral courage, and career identity among nurses: A cross-sectional study.** *Nurs Ethics* 2023, **30**(3):358-369.
18. Zheng X, Song J, Shi X, Lu G, Qu Z, Lu X, Chen C: **The effect of professional identity on new nurses' turnover intention: the mediating role of psychological capital and achievement motivation.** *BMC psychology* 2025, **13**(1):924.

19. Rasmussen P, Henderson A, Andrew N, Conroy T: **Factors Influencing Registered Nurses' Perceptions of Their Professional Identity: An Integrative Literature Review.** *Journal of continuing education in nursing* 2018, **49**(5):225-232.
20. Liu Y, Han Y, Xiong L, Ma Q, Mei L, Chong MC, Che CC: **The mediating role of psychological capital in the relationship between job stress and professional identity in Chinese medical interns.** *Work (Reading, Mass)* 2023, **76**(4):1597-1604.
21. Tao J, Wang Y, Chen M, Yan Z, Huang P: **Chain mediating effect of perceived organizational support and resilience on workplace violence and perceived professional identity of emergency nurses: a structural equation model analysis.** *BMC nursing* 2025, **24**(1):769.
22. Hobfoll S, Halbesleben J, Neveu J-P, Westman M: **Conservation of Resources in the Organizational Context: The Reality of Resources and Their Consequences.** *Annual Review of Organizational Psychology and Organizational Behavior* 2018, **5**.
23. Li L, Du Q, Ding H, Sun M, Ni L: **Assessing the categories and influencing factors of the professional identity among new nurses: a latent profile analysis.** *BMC nursing* 2025, **24**(1):648.
24. Xiaohua P: **Perceived organizational support and job burnout among nurses.** *Master's thesis.* Shanghai,China: Fudan university; 2011.
25. Luthans F: **Positive Organizational Behavior: Developing and Managing Psychological Strengths.** *Academy of Management Executive* 2002, **16**:57-72.
26. Tyler D, McCallum RS: **Assessing the Relationship between Competence and Job Role and Identity among Direct Service Counseling Psychologists.** *Journal of Psychoeducational Assessment* 1998, **16**(2):135-152.
27. Mantri S, Lawson JM, Wang Z, Koenig HG: **Identifying Moral Injury in Healthcare Professionals: The Moral Injury Symptom Scale-HP.** *J Relig Health* 2020, **59**(5):2323-2340.

28. Zhizhong W, Koenig HG, Yan T, Jing W, Mu S, Hongyu L, Guangtian L: **Psychometric properties of the moral injury symptom scale among Chinese health professionals during the COVID-19 pandemic.** *BMC Psychiatry* 2020, **20**(1):556.

29. Young Choi J, Hee Lee J: **Factors Affecting Professional Self-Concept among Psychiatric Nurses in South Korea.** *Iranian journal of public health* 2022, **51**(3):552-561.

30. Zhao S, Liang Q, Tao H, Fan S, Xia Y, Zeng L, Wang G, Liu H, Huang H, Xiao J: **Transition shock among nursing interns and its relationship with patient safety attitudes, professional identity and climate of caring: a cross-sectional study.** *BMC nursing* 2024, **23**(1):64.

31. Howle A, Carter G, Reising D: **Contemporary Factors Influencing Professional Identity in Acute Care Nurses: An Integrative Review.** *Journal of advanced nursing* 2025, **81**(10):6134-6154.

32. Chang T, Jiang X, Wei J, Zhao J, Li Z, Li H: **Mediating effects of psychological capital on the relationship between workplace violence and professional identity among nurses working in Chinese public psychiatric hospitals: a cross-sectional study.** *BMJ open* 2023, **13**(1):e065037.

33. Ren Z, Zhang X, Li X, He M, Shi H, Zhao H, Zha S, Qiao S, Li Y, Pu Y *et al*: **Relationships of organisational justice, psychological capital and professional identity with job burnout among Chinese nurses: A cross-sectional study.** *Journal of clinical nursing* 2021, **30**(19-20):2912-2923.

34. Mukherjee A, Saravanan A, Kamaraj A, Radhakrishnan V: **A Correlational Study on Professional Identity and Self-Efficacy Among Nursing Students.** *Cureus* 2024, **16**(8):e67508.

35. Qiu T, Liu C, Huang H, Yang S, Gu Z, Tian F, Wu H: **The mediating role of psychological capital on the association between workplace violence and professional identity among Chinese doctors: a cross-sectional study.** *Psychology research and behavior management* 2019, **12**:209-217.

36. Wu M, Yan J, Qiao C, Yan C: **Impact of Concurrent Media Exposure on Professional Identity: Cross-Sectional Study of 1087 Medical Students During Long COVID.** *Journal of medical Internet research* 2024, **26**:e50057.

37. Bakhshi Zadeh S, Parviniannasab AM, Bijani M, Dehghan A, Zare A: **The nurses' clinical environment belongingness and professional identity: The mediating role of professional values.** *Nursing ethics* 2025, **32**(3):851-863.
38. Wang TT, Yang B, Li YR, Zhang LL, Zhi XX, Wu B, Zhang Y, Zhao Y, Wang MX: **The mediating role of professional identity between work environment and caring behavior: a cross-sectional survey among hospice nurses in China.** *BMC nursing* 2024, **23**(1):874.
39. Cai G, Guo L, Li X: **Perceived organizational support on compassion fatigue among kindergarten teachers: a chain mediation model analysis of professional identity and emotional intelligence.** *BMC psychology* 2025, **13**(1):960.
40. Haischer-Rollo G, Meyer H, McMains KC, Varpio L, Bynum WEt: **How Shame Shaped Me: Exploring the Impact of Shame on Professional Identity Formation in Medical Trainees.** *Academic medicine : journal of the Association of American Medical Colleges* 2025, **100**(7):801-809.
41. Pindek S: **Failing Is Derailing: The Underperformance as a Stressor Model.** *Frontiers in psychology* 2020, **11**:1617.
42. Baldwin KM, Baldwin JR, Ewald T: **The relationship among shame, guilt, and self-efficacy.** *American journal of psychotherapy* 2006, **60**(1):1-21.
43. Anand T, Kandasamy A, Suman LN: **Self-stigma, hope for future, and recovery: An exploratory study of men with early-onset substance use disorder.** *Industrial psychiatry journal* 2022, **31**(2):299-305.
44. Shwartz-Asher D, Grabarski M, Tziner A, Work OSJJo, Organizaciones OP-RDPDITYDL: **Career Don't Stop Believing: Career Empowerment as a Mediator between Hope and Organizational Outcomes.** 2023, **77** 1:0.
45. Griep Y, Hansen SD, Kraak JM: **Perceived identity threat and organizational cynicism in the recursive relationship between psychological contract breach and counterproductive work behavior.** *Economic and industrial democracy* 2023, **44**(2):351-384.
46. Li Y, Zhang R, Kang L, Ma G: **Relationship between retention intention, perceived organizational support, and medical narrative ability among nurses: a cross-sectional multi-center study.** *Frontiers in health services* 2025, **5**:1648464.

47. Ma H, Zhu X, Huang J, Zhang S, Tan J, Luo Y: **Assessing the effects of organizational support, psychological capital, organizational identification on job performance among nurses: a structural equation modeling approach.** *BMC health services research* 2023, **23**(1):806.
48. Tian L, Wu A, Li W, Huang X, Ren N, Feng X, Zhang Y: **Relationships Between Perceived Organizational Support, Psychological Capital and Work Engagement Among Chinese Infection Control Nurses.** *Risk management and healthcare policy* 2023, **16**:551-562.
49. Greenblatt-Kimron L, Peled-Avram M, Gur A: **The mediating role of psychological capital in the relationship between moral injury and resilience among mental health professionals during wartime.** *Psychiatry research* 2026, **360**:117068.
50. Qiu H, Jing J, Ma Z, Fu Y, Liu D, Zhang H, Liu J, Chen C: **The relationship between organizational commitment, psychological capital, positive coping styles, and perceived professional benefit among new nurses: a longitudinal study.** *BMC nursing* 2025, **24**(1):886.
51. Liu X, Li C, Yan X, Shi B: **Psychological capital has a positive correlation with humanistic care ability among nurses.** *Frontiers in psychology* 2022, **13**:955627.
52. Xu J, Stark AT: **A conceptual model of nurses' workplace social capital: a theory synthesis.** *BMC nursing* 2021, **20**(1):148.
53. Gon R, Wu Y, Liu Y, Yang R, Zhang Y, Xing L: **Influence of Group Training Based on Psychological Capital Theory on Nursing Staff's Occupational Benefits and Job Satisfaction in an Infusion Preparation Center.** *Alternative therapies in health and medicine* 2023, **29**(3):186-192.
54. Kelley ML, Strowger M, Chentsova VO, Bravo AJ, Gaylord SA, Burgin EE, Vinci C, Ayers KL, Agha E: **Mindfulness to Manage Moral Injury: Rationale and development of a live online 7-week group intervention for veterans with moral injury.** *Contemporary clinical trials communications* 2022, **30**:101011.

55. Zhang R, Wang X, Chen J, Zhang S, Li Y: **The serial mediating effects of moral resilience and moral courage on the relationship between moral injury and positive coping style in Chinese nursing interns.** *Frontiers in psychology* 2025, **16**:1652127.
56. Ayvat P, Ayvat AG, Bilek G, Oner O, Sehitoglu Alpagut G, Sonmez OF: **Second-victim experience in anesthesia and intensive care settings: Organizational gaps, support preferences, and recommendations for action - a cross-sectional study.** *Medicine* 2025, **104**(30):e43375.