



**ORIGINAL RESEARCH:  
EMPIRICAL RESEARCH - QUANTITATIVE**

# The effect of resilience and self-efficacy on nurses' compassion fatigue: A cross-sectional study

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## Abstract

**Aim:** To measure the prevalence of compassion fatigue among Chinese clinical nurses and to examine the effects of resilience and self-efficacy on compassion fatigue.

**Design:** A cross-sectional descriptive survey was conducted in accordance with the STROBE guidelines.

**Methods:** Participants were recruited from three tertiary hospitals in central China from October 3 to December 15, 2019, using convenience sampling. Clinical nurses ( $n = 992$ ) from different nursing departments completed the General Information Questionnaire, Professional Quality of Life Scale, Connor-Davidson Resilience Scale, and General Perceived Self-Efficacy Scale. Descriptive statistics, t-tests, one-way analysis of variance, Pearson or Spearman's correlation analyses, and multiple linear regression models were used.

**Results:** Nurses experienced moderate levels of compassion fatigue (burnout and secondary traumatic stress). Resilience and self-efficacy were significantly negatively correlated with burnout but not with secondary traumatic stress. Linear regression analysis showed that resilience, self-efficacy, exercise, and physical conditions were the main predictors of burnout. Only physical conditions and marital status significantly predicted secondary traumatic stress.

**Conclusion:** Nurses are vulnerable to compassion fatigue in China. Resilience and self-efficacy significantly negatively predicted nurses' compassion fatigue. Physical conditions, healthy lifestyles, and social support are also important factors for compassion fatigue.

**Impact:** Our findings can be used to generate targeted intervention and coping strategies for nurses to improve their resilience and self-efficacy to alleviate compassion fatigue.

## KEYWORDS

burnout, compassion fatigue, healthy lifestyle, nurses, nursing, resilience, self-efficacy

## 1 | INTRODUCTION

Healthcare providers experience severe work-related stress because of the heavy emotional burden of caring for suffering patients (Sinclair et al., 2017). Among healthcare providers, nursing is a stressful and compassionate profession (Zhang et al., 2018). Nurses empathetically support patients with pain, loneliness, disease, and even death. They provide comfort, help, and presence to those with critical physical, mental, emotional, and spiritual needs (Ariapooran, 2014; Lombardo & Eyre, 2011). Nurses experience compassion fatigue (CF) due to repeated exposure to highly stressful and emotional situations (Jarrad et al., 2018). CF has a series of physiological, social, emotional, spiritual, and cognitive effects on nurses, threatening their existential integrity (Nolte et al., 2017). The effects include high rates of anxiety and depressive disorders, increased clinical errors, and decreased productivity, quality of care, and level of job satisfaction (Balinbin et al., 2020; Cross, 2019). Therefore, it is particularly important to pay attention to compassion fatigue to maintain the mental health of nurses.

### 1.1 | Background

CF refers to the process wherein caregivers empathetically bear the pain of the recipient, which reduces caregivers' own energy or interest (Barnett et al., 2019). CF among nurses can be explained as a cumulative and progressive absorption process of patients' pain and suffering formed through caring interactions with patients and their families (Jarrad et al., 2018). Based on a widespread conceptual model (Stamm, 2002), CF consists of two constructs: burnout and secondary traumatic stress. Evidence suggests that nurses are at a great risk of experiencing CF, generally at different levels. In Australia, nurses experience a moderate level of burnout (53%) and secondary traumatic stress (49%) (O'Callaghan et al., 2020), which is similar to the results in the United States (Wijdenes et al., 2019). Other studies indicate different results—Wang and Tian found that the proportion of nurses experiencing moderate CF ranges from 70% to 80% (Tian et al., 2018; Wang et al., 2020). Psychiatric nurses and oncology nurses suffer from severe CF (Arimon-Pages et al., 2019; Tian, Chen, et al., 2017; Tian, Shi, et al., 2017). CF is gradually becoming a serious problem that can affect nurses' physical and psychological health, performance, job satisfaction, and quality of care (Kelly et al., 2015). Thus, investigating the prevalence of CF among nurses and their related factors is warranted to prevent CF among the nursing population.

Research has examined the influencing factors of CF. Some studies have found that demographic characteristics (Zhang et al., 2018), work-related factors (Tian, Chen, et al., 2017; Tian, Shi, et al., 2017; Wang et al., 2020), degree of exposure to traumatic events (Fukumori et al., 2020; Tian, Chen, et al., 2017; Tian, Shi, et al., 2017), and psychological factors (Barnett & Ruiz, 2018) are affected nurses' CF. Some studies suggest that resilience, social support, sense of control, and meaningful recognition are

negatively correlated with CF (Cetrano et al., 2017; Tian et al., 2018). Among them, resilience and self-efficacy are considered important psychological factors affecting individuals' mental health, and they play an important role in the occurrence of CF (Karami et al., 2017).

Resilience is the internal motivation of an individual to mobilize other resources in the face of adversity or setbacks, and quickly adapt and recover (Henley, 2010). Empirical studies have shown that resilience is a key factor in helping individuals cope with stress or adversity effectively and develop problem-solving skills to recover from negative events (Rushton et al., 2015; Zhang et al., 2017). Research on resilience in nurses indicated that resilience is a critical factor in protecting against work-related stress and is a crucial component for promoting nurses' mental and physical health (McDonald et al., 2013). Alharbi et al. (2020) found that demographic and workplace structural elements are all significant factors affecting resilience to resist CF among Saudi critical care nurses. However, few studies have been conducted to test the direct effect of resilience on CF among nurses, especially in mainland China.

Self-efficacy refers to one's belief and confidence in his/her ability to overcome difficult situations or stressful events (Li et al., 2019). When coping with stressful events, self-efficacy is an important determinant of psychological adjustment (Bandura, 1977). Several studies have been conducted to investigate the relationship between self-efficacy and CF (Pietrantonio & Prati, 2008), however, few involved nurses. In summary, the working pressure of clinical nurses comes from situations where they are exposed to patients' traumatic events and provide excessive empathy for the long term. CF among nurses is an undesirable outcome caused by maladaptation to this pressure. Moreover, resilience and self-efficacy play an important role in individual coping and psychological adjustment in the face of stressful events. Therefore, it is necessary to explore the roles of resilience and self-efficacy in CF.

According to the theoretical path analysis of professional caregivers' quality of life (Stamm, 2002), both secondary traumatic stress and burnout contribute to an increased risk of CF. In addition, work environment, client environment, and personal environment factors have an influence on the development of compassion satisfaction and compassion fatigue (Stamm, 2002). About the psychological stress system (Jiang, 2004), individuals live in the process of interaction and dynamic balance of multiple stress-related factors. When confronted with stressful events, individuals have a stress response as a joint result of environmental and personnel factors. Thus, in accordance with these two theories, being exposed to traumatic events is considered as a stressor, which could lead to CF. During this process, several external factors (work-related environmental factors) and internal factors (personality and social support) affect CF. In this study, resilience and self-efficacy is recognized as individual psychological characteristics and CF is treated as a psychological change. Although there have been several studies on predictors of CF among nurses around the world, limited knowledge exists on the internal factors (resilience and self-efficacy) and external predictive

factors (demographic, work-related factors) of CF among nurses, especially in mainland China. In addition, examining the role of psychological factors in CF of clinical nurses is of great significance, as nurses can learn to effectively use psychological resources to prevent CF. This study also lays the foundation for formulating targeted interventions from a psychological perspective.

## 2 | THE STUDY

### 2.1 | Aims

This study aimed to investigate the level of CF among Chinese nurses and examine the influence of demographic characteristics, work-related factors, resilience, and self-efficacy on CF.

### 2.2 | Design

This study adopted a cross-sectional design. It was executed and reported in accordance with STROBE Statement: guidelines for reporting observational studies (von Elm et al., 2007). We also registered the trial on clinicalTrials.gov PRS, and the ID was NCT04911504.

### 2.3 | Participants

A convenience sample of clinical nurses from different departments was recruited from three tertiary hospitals in central China. The inclusion criteria were as follows: (1) the hospital is a comprehensive hospital, (2) nurses have been registered and are on duty, (3) nurses are currently engaged in clinical practice, and (4) nurses are willing to participate in the study. Nurses who are interns, studying in other hospitals, or who have participated in other relevant studies were excluded from the study.

A fixed model in G power software 3.1 (Faul et al., 2009) was used to calculate the sample size for linear multiple regression. The effect size  $f^2 = 0.15$ ,  $\alpha = 0.05$ ,  $1-\beta = 0.95$ . The study included 15 explanatory variables (13 demographic variables, resilience, and self-efficacy). The sample size was calculated as 199. Considering 20% loss to follow-up rate and sampling error, the sample size was expanded to 239.

### 2.4 | Data collection

#### 2.4.1 | The general information questionnaire

The sociodemographic questionnaire was self-compiled and aimed to collect participants' demographic characteristics such as age, gender, educational level, marital status, working department, years of nursing experience, professional title, employment type, monthly

income, shift work, whether have any children, frequency of exercise and physical conditions.

#### 2.4.2 | Professional quality of life scale (Chinese version; ProQOL-CN)

The Professional Quality of Life Scale was used to evaluate the level of compassion fatigue. The original version was developed by Stamm (2010) and then translated into Chinese by Zheng et al. (2013), which was authorized by Stamm. The scale has 30 items with three subscales: compassion satisfaction (3, 6, 12, 16, 18, 20, 22, 24, 27, 30), burnout (1, 4, 8, 10, 15, 17, 19, 21, 26, 29), and secondary traumatic stress (2, 5, 7, 9, 11, 13, 14, 23, 25, 28). Among items of burnout, items 1, 4, 15, 17, and 29 were reverse scored. Together, these two subscales measure compassion fatigue (Stamm, 2010). A five-point Likert scale was used (1 = "never" to 5 = "very often") (Shen et al., 2015). Higher scores indicated higher levels of compassion satisfaction and higher risk of burnout and secondary traumatic stress, respectively. A score of each subscale lower than 22 indicates a low level of compassion satisfaction, burnout, and secondary traumatic stress; scores between 23–41 indicate an average level, and more than 42 points suggest a high level (Stamm, 2010). Cronbach's alpha for the scale in this study was 0.722.

#### 2.4.3 | Connor-Davidson resilience scale (Chinese version; CD-RISC)

The CD-RISC aimed to measure participants' resilience. Connor and Davidson developed the original version (Connor & Davidson, 2003). Yu et al. (2007) translated it into Chinese after obtaining authorization from the original developers. The Chinese version of the CD-RISC consists of three dimensions (tenacity, strength, and optimism) with 25 items. Participants respond on a five-point Likert scale (0 = "never" to 4 = "almost always") (Yu et al., 2007). The scale can effectively measure resilience among clinical nurses and has good reliability and validity (Guo et al., 2018). The reliability of the CD-RISC among Chinese residents was 0.91 (Yu et al., 2007) and the Cronbach's alpha of the scale in this study was 0.966.

#### 2.4.4 | General Perceived Self-Efficacy Scale (Chinese version; GSES)

The GSES, a scale developed by Scherbaum, was used to measure participants' self-efficacy (Scherbaum et al., 2006). Wang translated the Chinese version (Wang et al., 2001). The scale consists of 10 items assessed using a four-point Likert scale (1 = incorrect to 4 = correct). The total scores range between 10–40, with higher total scores indicating higher levels of self-efficacy. The Cronbach's alpha for the scale in this study was 0.941.

## 2.4.5 | Procedures

Data were collected from October 3 to December 15, 2019. Data collection was completed by a researcher and two research assistants. First, the researchers informed the directors and head nurses from each hospital, the purpose of the study, and obtained their permission to recruit nurses. Thereafter, researchers introduced the contents of the questionnaires to research assistants in the hospital and explained how to complete it. Finally, researchers distributed a Wenjuanxing link (an online crowdsourcing platform in China) involving electronic research questionnaires by scanning a quick response code to research assistants. According to the inclusion criteria, interested nurses could contact the researchers and research assistants in the hospital to participate in the study. Wenjuanxing is a relatively secure platform, and there is no risk of any data breach or leakage by a third party.

## 2.5 | Ethical considerations

This study was approved by the university's institutional review board (IRB) before data collection. The purpose and procedures of the study were explained to the participants before answering the questionnaires. Researchers informed participants of their rights to withdraw from the research at any time. All eligible participants signed an electronic informed consent form before they completed the questionnaires.

## 2.6 | Data analysis

Data analyses were conducted using IBM SPSS Statistics (version 20.0; IBM, Chicago, IL, USA). Descriptive data, including means and standard deviations, frequency, and percentage, were used to analyse demographic information, resilience, and self-efficacy. Pearson's correlation analyses were used for correlations between two variables, and ANOVA analysis and t-test were used to analyse the significance of sociodemographic differences among CFs. Multiple linear regression analysis was used to identify the influence of sociodemographic variables, self-efficacy, and resilience on CF. All statistical tests were two-sided ( $\alpha = 0.05$ ).

## 2.7 | Validity and reliability

The content appropriateness of the measurement was evaluated via expert consultation before the study began. A pilot test including 40 clinical nurses from one hospital was conducted to examine the reliability and validity of the measurements. In the current study, the Cronbach values of the whole scale were above 0.72, indicating good reliability. After data collection, all data were carefully examined and put into SPSS by two researchers independently. Prior to data analysis, researchers were required to check for missing data and outliers.

## 3 | RESULTS

### 3.1 | Sample characteristics

A total of 992 nurses participated in the survey. Fourteen nurses declined to complete the questionnaires. Consequently, only 978 nurses were included in the analyses (valid response rate = 98.6%). Most nurses were female (93.9%), 61.2% of the nurses were married, and participants represented many specialty departments. The other sociodemographic characteristics of the nurses are shown in Table 1.

### 3.2 | Compassion fatigue, resilience, self-efficacy, and their associations

The mean scores of burnout, secondary traumatic stress, and compassion satisfaction were 27.49 (SD 5.31), 27.15 (SD 5.54), and 31.97 (SD 7.20), respectively, which were all at the average level. The average total scores for resilience and self-efficacy were 60.34 (SD 15.97) and 25.43 (SD 5.93), respectively. The detailed descriptive results are shown in Table 2.

As shown in Table 2, 82.8% of nurses reported average levels of compassion satisfaction, 83.2% reported average levels of burnout, and 78.9% reported average levels of secondary traumatic stress. Of the participants, 16.2% and 20.2% indicated low levels of burnout and secondary traumatic stress, respectively. In addition, the percentages of the high levels were 0.6% and 0.8%, respectively. About to the association among the variables, compassion satisfaction was positively correlated with resilience ( $r = 0.559$ ,  $p < .001$ ) and self-efficacy ( $r = 0.469$ ,  $p < .001$ ), and burnout was inversely associated with resilience ( $r = -0.469$ ,  $p < .001$ ) and self-efficacy ( $r = -0.387$ ,  $p < .001$ ). In addition, secondary traumatic stress was not related to resilience ( $r = -0.060$ ,  $p = .060$ ) and self-efficacy ( $r = -0.007$ ,  $p = .827$ ). Detailed information is provided in Table 3.

### 3.3 | Univariate analyses of the factors associated with CF

Through ANOVA analysis and t-test, the results revealed that age, gender, years of nursing experience, professional title, employment type, and physical conditions influenced burnout and secondary traumatic stress. Additionally, the highest education level, income per month, shift work, children, and frequency of exercise influenced burnout. Finally, marital status and department influenced secondary traumatic stress. Detailed data are shown in Table 1.

### 3.4 | Regression analyses examining covariates of compassion fatigue

As mentioned, burnout and secondary traumatic stress differed significantly depending on the demographic variables. Before

TABLE 1 Socio-demographic characteristics of participants and differences among variables (N = 978)

Variables	Category	N	%	Burnout			Secondary traumatic stress		
				M (SD)	t/f	p	M (SD)	t/f	p
Age (years)									
	20–25	215	22	27.12 (5.736)	19.797	$p < .001^*$	26.07 (5.729)	9.136	$p < .001^*$
	26–35	634	64.8	28.12 (4.944)			27.70 (5.522)		
	≥36	129	13.2	25.00 (5.314)			26.23 (4.969)		
Gender									
	Female	918	93.9	27.59 (5.246)	2.315	.021 <sup>*</sup>	27.27 (5.460)	2.343	.022 <sup>*</sup>
	Male	60	6.1	25.95 (6.119)			25.27 (6.470)		
Education level									
	Diploma	3	0.3	33.33 (2.517)	4.985	.002 <sup>*</sup>	35.33 (8.386)	2.300	.076
	Associate degree	119	12.2	26.78 (5.566)			26.94 (5.558)		
	Bachelor degree	784	80.2	27.73 (5.282)			27.17 (5.574)		
	Master degree or above	72	7.4	25.78 (4.839)			26.89 (4.912)		
Marital status									
	Married	599	61.2	27.37 (5.343)	0.675	.509	27.48 (5.280)	3.206	.041 <sup>*</sup>
	Single	366	37.4	27.62 (5.327)			26.57 (5.969)		
	Divorced or separated	13	1.3	28.85 (3.211)			28.08 (3.685)		
Department									
	Medical	271	27.7	28.02 (5.408)	1.208	.282	27.36 (5.533)	2.676	.003 <sup>*</sup>
	Surgical	237	24.2	27.85 (5.121)			27.47 (5.450)		
	Obstetrics and Gynecology	63	6.4	26.84 (5.649)			27.06 (6.180)		
	Pediatrics	29	3.0	27.24 (6.351)			25.72 (4.765)		
	Emergency departments	23	2.4	27.43 (4.747)			26.00 (6.164)		
	ICU	71	7.3	27.94 (4.705)			29.45 (6.030)		
	Operating room	98	10.0	26.69 (4.638)			26.14 (5.091)		
	Outpatient services	54	5.5	26.76 (5.429)			26.13 (5.270)		
	Psychiatry	10	1.0	25.90 (4.202)			23.40 (4.624)		
	Oncology	18	1.8	27.67 (5.303)			26.72 (6.772)		
	Others	104	10.6	26.65 (6.016)			26.88 (5.031)		
Years of nursing experience									
	<2 years	141	14.4	26.23 (5.501)	7.523	$p < .001^*$	25.89 (6.141)	2.724	.019 <sup>*</sup>
	2–5 years	229	23.4	28.28 (5.424)			26.97 (5.602)		
	6–10 years	346	35.4	28.09 (4.984)			27.70 (5.301)		
	11–20 years	202	20.7	27.23 (5.196)			27.41 (5.458)		
	21–30 years	46	4.7	24.13 (5.381)			26.22 (5.320)		
	≥31 years	14	1.4	26.86 (4.975)			28.50 (4.202)		
Professional title									
	Junior RN	202	20.7	26.47 (5.716)	20.519	$p < .001^*$	26.00 (5.763)	5.532	.001 <sup>*</sup>
	Senior RN	512	52.4	28.62 (4.910)			27.76 (5.751)		
	Nurse in charge	237	24.2	26.38 (5.255)			26.93 (4.812)		
	Associate professor or professor nurses	27	2.8	23.26 (4.596)			25.96 (4.345)		
Employment type									
	Formal employed nurse	185	18.9	25.37 (5.164)	19.126	$p < .001^*$	26.05 (5.169)	6.856	.001 <sup>*</sup>
	Personal agent nurse	538	55.0	28.10 (5.159)			27.69 (5.486)		

(Continues)

TABLE 1 (Continued)

Variables	Category	N	%	Burnout			Secondary traumatic stress		
				M (SD)	t/f	p	M (SD)	t/f	p
	Contract employed nurse	255	26.1	27.73 (5.380)			26.79 (5.798)		
Income per month									
	<3000 yuan (US, \$500)	55	5.6	26.75 (5.535)	3.141	.014 <sup>*</sup>	26.64 (5.973)	0.769	.545
	3001–5000 yuan (US, \$500–\$830)	120	12.3	28.40 (5.055)			26.77 (5.949)		
	5001–7000 yuan (US, \$830–\$1160)	254	26.0	27.26 (5.566)			27.22 (5.767)		
	7001–9000 yuan (US, \$1160–\$1500)	329	33.6	27.97 (5.212)			27.51 (5.188)		
	>9001 yuan (US, \$1500)	220	22.5	26.71 (5.146)			26.85 (5.473)		
Shift work									
	Yes	658	67.3	27.90 (5.229)	3.488	.001 <sup>*</sup>	27.25 (5.640)	0.845	.398
	No	320	32.7	26.64 (5.396)			26.93 (5.346)		
Have any children									
	Yes	515	52.7	27.14 (5.297)	–2.175	.030 <sup>*</sup>	27.24 (5.334)	0.585	.558
	No	463	47.3	27.87 (5.312)			27.04 (5.774)		
Frequency of exercise									
	Never	226	23.1	29.19 (5.137)	30.366	$p < .001^*$	27.56 (5.703)	2.400	.091
	Sometimes	668	68.3	27.33 (5.068)			27.15 (5.498)		
	Always	84	8.6	24.13 (5.917)			26.01 (5.387)		
Physical conditions									
	Good	370	37.8	24.95 (5.223)	98.232	$p < .001^*$	25.75 (5.689)	27.680	$p < .001^*$
	General	497	50.8	28.49 (4.670)			27.59 (5.099)		
	Bad	111	11.3	31.44 (4.354)			29.82 (5.707)		

\* $p < .05$ 

regression analyses, we tested the normality of the data on burnout and secondary traumatic stress using the Shapiro-Wilk test of normality. The results indicated that the data on burnout ( $p = .352 > .05$ ) and secondary traumatic stress ( $p = .232 > .05$ ) fit the normal distribution. Regression analyses were conducted, and burnout and secondary traumatic stress were placed as outcome variables, while resilience, self-efficacy, and other sociodemographic variables that reported significant differences were regarded as explanatory variables. The variables were then screened using the stepwise method, and regression analysis was performed (entered  $\alpha = 0.10$ , exited  $\alpha = 0.15$ ). As shown in Table 4, in the burnout model, the results indicated that low levels of resilience and self-efficacy, poor physical conditions, and no physical activity were the main predictors of a high level of burnout ( $F = 127.296$ ,  $p = .000$ ,  $R^2 = 0.344$ , adjusted  $R^2 = 0.341$ ). This means that 34.1% of the variance in burnout was explained by resilience, self-efficacy, physical conditions, and the frequency of exercises. About the secondary traumatic stress model, poor physical conditions and divorce or separation were the main predictors of a high level of secondary traumatic stress ( $F = 31.965$ ,  $p < .001$ ,  $R^2 = 0.369$ , adjusted  $R^2 = 0.062$ ). This means that 6.2% of

the variance in secondary traumatic stress was explained by physical conditions and marital status.

## 4 | DISCUSSION

CF is crucial for nurses' health, safety, and patient care quality. This study explored the role of resilience and self-efficacy in CF (burnout and secondary traumatic stress) and clarified the relationships between the four variables among nurses. Our results aimed to deepen the understanding of improving resilience and self-efficacy to facilitate the development of more mental health-targeted interventions to relieve nurses' CF.

### 4.1 | Status of compassion fatigue, resilience, and self-efficacy

Our study showed that most nurses had average levels of burnout and secondary traumatic stress. Compared to previous research

TABLE 2 Mean and standard deviations of variables (N = 978).

Variables	Mean	SD	Frequency	Percentage
Compassion satisfactory	31.97	7.200		
Low level			85	8.7
Average levels			810	82.8
High level			83	8.5
Burnout	27.49	5.314		
Low level			158	16.2
Average levels			814	83.2
High level			6	0.6
Secondary traumatic stress	27.15	5.545		
Low level			198	20.2
Average levels			772	78.9
High level			8	0.8
Resilience				
Tenacity	30.75	8.536		
Strength	20.44	5.498		
Optimism	9.15	2.783		
Total scores	60.34	15.975		
Self-efficacy	25.43	5.934		

TABLE 3 Pearson's correlations (*p*-values) between variables among nurses (N = 978)

	Resilience ( <i>r</i> , <i>p</i> )	Self-efficacy ( <i>r</i> , <i>p</i> )
Compassion satisfactory	0.559 ( <i>p</i> < .001)*	0.469 ( <i>p</i> < .001)*
Burnout	-0.469 ( <i>p</i> < .001)*	-0.387 ( <i>p</i> < .001)*
Secondary traumatic stress	-0.060 (.060)	-0.007 (.827)

\**p* < .05

among clinical nurses from different nursing departments (Wang et al., 2020), our findings represent similar levels of burnout, lower levels of compassion satisfaction, but higher secondary traumatic stress. However, when compared to oncology nurses, our findings showed higher levels of burnout, lower levels of compassion satisfaction, and similar levels of secondary traumatic stress (Yu et al., 2016). According to a study in Iran (Salimi et al., 2020), nurses in our study had lower levels of compassion satisfaction but higher levels of burnout and secondary traumatic stress, which is also applicable in comparison with American nurses in the emergency department (Hunsaker et al., 2015). The discrepancy can be explained by the fact that different work areas and unit cultures, differences in workload, patient's condition, nurse working experience, and job title can cause different levels of compassion pressure, resulting in different degrees of CF. With the critical requirement of Chinese health policy and the increasing number of patients, the nursing shortage is an obvious problem (Guo et al., 2018). Chinese nurses need more time and capacity to cope with clinical workloads, which can accordingly

affect enthusiasm for work and the relationship with patients. Furthermore, when providing nursing care to patients, nurses provide a certain degree of empathy. When empathy is provided without adequate rest, a series of symptoms of CF are likely to appear. Therefore, it is suggested that Chinese clinical nurses suffer from high levels of CF. Health institutions should pay more attention to this phenomenon and help nurses deal with it.

The status of resilience among clinical nurses in this study was at a moderate level, which was lower than that in Rushton's research (Rushton et al., 2015) conducted in America and Hegney's research (Hegney et al., 2015) with Australian nurses. However, it was consistent with the results of Guo's study (Guo et al., 2019). This may be explained by the shortage of nurses, excessive nursing demands, frustrations of work, and increased workload to nurses can reduce nursing efficiency and decrease job performance, which can further affect nurses' confidence and well-being. Throughout this study, the status of self-efficacy among clinical nurses was lower than that of the study in Iran (Soudagar et al., 2015) but was higher compared to Yao's (2018) findings. Perhaps the difference in working department, working experience, and working environment can explain this situation.

## 4.2 | Predictors of compassion fatigue

In this study, resilience, self-efficacy, and physical condition positively affected burnout. As an individual's ability to protect their mental health, resilience plays a decisive role in the response of individuals under pressure and can help them deal with pressure successfully (Poudel-Tandukar et al., 2019; Richardson, 2002). For clinical nurses who often experience traumatic feelings of patients and compassion pressure for long term, developing resilience has become increasingly important. It has a significant relationship with increased quality of life, effective use of adaptive coping strategies, and better health (Gillespie et al., 2007). In this study, nurses with higher levels of resilience experienced lower levels of burnout, and it is possible that nurses who have high levels of resilience usually remain positive and regard the traumatic experiences of patients they encounter in their work as a normal part of life. This helps them cope with compassion distress more successfully. As a result, they achieve further growth positively and experience less burnout due to patients' trauma and a complex working environment. A previous study also indicated that increased resilience can help nurses reduce emotional exhaustion resulting from patients and increase job satisfaction by assisting nurses in establishing strategies to deal with adversity (Yu et al., 2019). Therefore, nursing managers should implement effective strategies to improve nurses' resilience skills, including education about resilience, and constructing a healthy and harmonious working environment.

Self-efficacy has an important influence on people's feelings, thoughts, and actions. People who have high levels of self-efficacy tend to perform more challenging tasks (Zulkosky, 2009), set higher goals for themselves, sometimes increase their commitment to these

TABLE 4 Multiple linear regression analysis examining covariates of CF ( $n = 978$ )

Outcome variables	Explanatory variables	B	Beta	t	p	F	Adjusted R <sup>2</sup>
Burnout	Resilience	-0.107	-0.323	-9.374	$p < .001^*$	127.296	0.341
	Self-efficacy	-0.105	-0.117	-3.421	.001 <sup>*</sup>		
	Physical conditions	2.532	0.310	11.366	$p < .001^*$		
	Exercise	-0.843	-0.086	-3.184	.002 <sup>*</sup>		
Secondary traumatic stress	Physical conditions	2.050	0.240	7.706	$p < .001^*$	31.965	0.06
	Marital status	-0.968	-0.090	-2.894	.004 <sup>*</sup>		

\* $p < .05$ 

goals, and attain a better outcome (Bandura, 1977). It has been reported that individuals with high levels of self-efficacy tend to adopt positive coping strategies and believe that they are able to complete the tasks and do not feel too much pressure (Zhang & Lu, 2009). Therefore, nurses with high levels of self-efficacy often regard compassion pressure resulting from patients in daily work as opportunities rather than threats. They believe that they can overcome stress rather than avoid them, so they suffer from low burnout. Thus, this finding suggests that appropriate interventions that improve nurses' self-efficacy may reduce burnout.

Sociodemographic variables, including physical conditions and frequency of exercise, had a significant influence on burnout. In this study, we found that 67.3% of clinical nurses had shift work, which was inconsistent with the biological clock of the individual body, causing damage to nurses' physical health. During shift work, nurses experience more work stress and heavy workloads, which usually require good physical conditions. They also spend more time with patients and immerse themselves in negative emotions from patients (Wang et al., 2020). Gradually, their work leads to emotional exhaustion and burnout, no longer with good physical conditions (Yu et al., 2016). Previous studies have indicated that exercise plays an important role in the management of stress and anxiety (Subramaniapillai & Mehala, 2014). About nurses, participating in physical exercises regularly could reduce their physical and emotional stress from patients during clinical work, avoid burnout, and remain active in clinical practice much longer. However, they tend to have less time and frequency to exercise, as they choose more time to rest rather than exercise after the shift work. Given the excessive workload, maintaining good physical conditions, and exercising regularly are beneficial for improving burnout.

Clinical nurses are often exposed to patients who experience traumatic events and tend to experience secondary traumatic stress. The results of this study showed that physical conditions and marital status can significantly predict secondary traumatic stress. Some studies have indicated that nurses who have damaged physical health caused by poor sleep are prone to experiencing secondary traumatic stress (Quinal et al., 2009). Mind-body interaction (MBI) is based on the procedures of Walker and Avant, which refer to the holistic association and interactive process between wisdom, thinking, belief, and physiological reactions, which critically affect health (Chen et al., 2015). Thus, poor physical

conditions can affect nurses' mental state during job performance. Thus, nurses were more likely to experience stress in patients' trauma and ultimately leading to secondary traumatic stress. A previous study also showed that social support from family members could moderate the relationship between occupational stress and the mental-physical health of nurses (Jones, 2008). Nurses who have been married can communicate with their partners when experiencing traumatic stress to regulate their emotions. Therefore, good social support from family members can result in positive attitudes towards work and less secondary traumatic stress.

### 4.3 | Limitations

This study has several limitations. First, the causal relationships among variables should be interpreted with caution because of the cross-sectional design. Future studies should be longitudinal in nature to explore causal relationships among the variables. Second, the participants in this study were recruited from three tertiary hospitals in central China through convenience sampling, which may generate selection bias and limit the generalizability of the findings. Future research should consider expanding the sample's geographical scope. Third, this study analysed internal factors (resilience and self-efficacy) as explanatory variables of compassion fatigue. Further studies are recommended to consider more internal factors, such as social support, personality traits, coping styles, etc. Therefore, future longitudinal research should be conducted to explore the long term and dynamic compassion fatigue of clinical nurses.

## 5 | CONCLUSION

This cross-sectional study enriches our knowledge about the role of resilience and self-efficacy in influencing nurses' compassion fatigue. The current study has demonstrated that resilience, self-efficacy, and demographics (physical conditions, frequency of exercise, and marital status) can significantly predict nurses' level of compassion fatigue. In the future, we need to pay more attention to these risk factors (low level of resilience and self-efficacy, poor



physical conditions, and insufficient physical activity) to identify high-risk groups of compassion fatigue, to achieve accurate prediction. Nursing administrators should realize the value of resilience and self-efficacy and provide targeted interventions to improve nurses' resilience and self-efficacy to effectively alleviate their compassion fatigue. Moreover, good physical conditions, healthy lifestyles, and good social support are also recommended.

## 5.1 | Relevance to clinical practice

In this study, clinical nurses from China reported moderate levels of compassion fatigue. Resilience, self-efficacy, and demographic characteristics (frequency of exercise and physical conditions) were the main predictors of burnout. Coping strategies to improve resilience and self-efficacy, such as education about resilience and self-efficacy and learning positive coping skills and attitudes, should be implemented by nursing administrators. Physical conditions and marital status significantly contributed to secondary traumatic stress in this study, indicating that optimizing a good working environment, cultivating a healthy lifestyle, and enjoying a harmonious relationship with family members will contribute to the reduction of secondary traumatic stress. In addition, for clinical nurses, maintaining a healthy body in the face of a complex working environment also needs to be considered.

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## CONFLICTS OF INTEREST

No conflict of interest has been declared by the authors.

## AUTHOR CONTRIBUTIONS

Study design: Jingping Zhang, Jie Zhang; Data collection: Xiao Wang, Tianqing Xu, Yuchen Wu, Jie Zhang, Yifei Li, Yiping Chen, Juan Li; Data analysis: Jie Zhang, Tianqing Xu; Study supervision: Jingping Zhang, Xiao Wang; Manuscript writing: Jie Zhang; Critical revisions for important intellectual content: Huiyuan Li, Jie Zhang, Juan Li, Xiao Wang, Tianqing Xu.

## ETHICS APPROVAL

This study was approved by Central South university's Institutional Review Board (IRB) [No: E202027] before data collection.

## PEER REVIEW

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