

Relationship between COVID-19 stress and Chinese nurses' turnover intention: The effect of psychological security and psychological well-being

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Abstract: Due to the coronavirus disease 2019 (COVID-19) pandemic, many employees have shown high turnover intention, mainly because of the enormous psychological stress generated, especially among medical personnel. In this study, the relationship between COVID-19 stress and turnover intention was examined by performing hierarchical regression analysis, common method bias analysis, and confirmatory factor analysis of data obtained from 319 nurses. The results of the study show that COVID-19 stress had a significant direct effect on nurses' turnover intention, and psychological security and psychological well-being mediated the relationship between COVID-19 stress and nurses' turnover intention. Furthermore, psychological security and psychological well-being played a sequential mediating role in the relationship between COVID-19 stress and nurses' turnover intention. These findings suggest that hospital managers should provide supportive resources to help nurses cope with COVID-19 stress, increase psychological security and psychological well-being, and thus reduce nurses' turnover intentions.

Keywords: Chinese nurse, COVID-19 stress, Turnover intention, Psychological security, Psychological well-being

1. Introduction

Classified by the World Health Organization (2020) as a pandemic, coronavirus disease 2019 has caused enormous damage to the global economy, society and the environment. China has experienced a wave of infections in early 2023, which has brought enormous stress to organizations and individuals, especially nurses who are fighting on the front line and thus facing substantial work challenges. Research has shown that during the COVID-19 pandemic, frontline nurses widely experienced significant mental health problems^[1], including fear, anxiety, depression, and stress^[2]. Due to increased stress and a lack of effective support, many nurses choose to resign^[3], but nurses who choose to stay may also have high turnover intention^[4]. Some studies have noted that the fear of COVID-19 increases the turnover intention of nurses^[5] and that nurses' perception of COVID-19 risk affects turnover intention through work-family conflict^[6]. Nurses' turnover intention also increases significantly when COVID-19-related discrimination is perceived^[7]. The COVID-19 pandemic alters nurses' psychological resilience, thereby affecting their turnover intentions^[8]. Furthermore, it leads to excessive job demands and a turbulent work environment, increasing nurses' stress and resulting in turnover intentions^[9]. However, few studies have analyzed the relationship between COVID-19 stress and turnover intention and the mechanisms behind this relationship. The purpose of this study is to investigate whether and how COVID-19 stress affects nurses' turnover intention and to help managers formulate relevant policies to reduce nurse turnover intention, improve work efficiency, and reduce the turnover rate.

The contributions of this study are as follows. First, due to the COVID-19 pandemic, exploring the impact of the resulting stress on the turnover intention of nurses extends the research on the antecedents of turnover intention in crisis situations. Second, by introducing two mediating variables, i.e., psychological security and psychological well-being, the mechanism between COVID-19 stress and nurses' turnover intention was revealed, and the psychological mechanism of nurse turnover intention was refined. Finally, this study provides a theoretical basis for hospital managers to make staff management decisions in crisis situations.

2. Theoretical basis and research assumptions

2.1. COVID-19 stress and turnover intention

The COVID-19 pandemic has created many mental health issues for medical personnel. Nurses experience greater COVID-19 stress due to their higher perceived risk of COVID-19 infection, as they are frequently exposed to high-risk work environments and infected patients [10]. Some studies have confirmed that stress similar to the COVID-19 pandemic can cause psychological issues such as anxiety, depression, and social withdrawal [11] and thus have an important impact on individual psychological function and well-being [12]. Turnover intention refers to an individual's intention to leave an organization after careful consideration or an individual's consideration of leaving an organization to seek other job opportunities [13] and is usually regarded as the last step before turnover behavior. When COVID-19 first emerged, study found that approximately 8% of the nurses surveyed indicated an intention to leave their current job [14], and those in COVID-19 wards had significantly higher turnover intention than did nurses in non-COVID-19 wards [15]. During the COVID-19 pandemic, there have been many factors that have affected nurses' turnover intention, for example, occupational stress, epidemic fear, resilience, and COVID-19 discrimination [16].

According to the transactional model of stress and coping (TMSC), if individuals are stressed, they will adopt distancing and avoidance strategies [17]. Some studies shows that job stress is an important factor affecting turnover intention [18]. When nurses perceive COVID-19 stress at work and current measures do not adequately relieve stress, they will choose to withdraw from work to avoid falling into greater uncertainty. Nurses are undoubtedly one of the groups who have experienced the greatest job stress during the COVID-19 pandemic. A study also confirmed that nurses' job stress during COVID-19 is an important predictor of turnover intention [19]. Therefore, this study hypothesizes that:

H1: COVID-19 stress has a significant positive impact on the turnover intention of nurses.

2.2. The mediating role of psychological security

Psychological security refers to employees' beliefs that their self-image, role and status will be fairly evaluated when they present themselves as they are at work [20]. When an employee is free to express himself or herself in an organization without fear of negative consequences, he/she feels safe [21]; in contrast, when an employee cannot express himself or herself freely in an organization, he/she may become fearful of negative results, and he/she will feel insecure.

During the COVID-19 pandemic, nurses have had to directly face the threat brought by COVID-19, have had to spend abundant energy dealing with various emergencies at work, and at the same time have had to prevent themselves from being infected, all of which consume many psychological resources [22]. However, a strong sense of responsibility has driven nurses to stick with their jobs under the stress of COVID-19 [23], objectively increasing the requirements of nurses at work. Because an individual's resources such as time and energy are limited, nurses feel psychologically insecure when individual resources are insufficient to meet high job demands. The conservation of resources (COR) theory argues that people strive to acquire and retain their key resources [24]. Individuals who feel insecure in an organization will lose valuable psychological resources. To cope with this stress, employees mainly show emotional exhaustion [25] and organizational deviation [26]. Defensive measures include job withdrawal. Therefore, this study hypothesizes that:

H2: COVID-19 stress reduces psychological security, which in turn leads to an increase in turnover intention.

2.3. The mediating role of psychological security

Psychological well-being refers to the security of a person's psychological functioning and includes factors such as self-acceptance, positive relationships with others, environmental control, autonomy, personal growth, and purpose in life [27]; it encompasses the beauty of life [28] and involves the satisfaction of competency, relationship, and autonomy needs [29]. According to the COR, individuals use the key resources they have to deal with stressful situations, and they actively construct and protect their own resources to deal with possible future stressful situations [30].

During the COVID-19 pandemic, nurses have been in a high workload and stressful environment for a long time, and many are worried about being infected and have been in a state of stress, which consumes

their time, knowledge, and psychological resources. Furthermore, they are unable to replenish their resources in a timely manner, thus failing to possess the resources required for their competency, relationship and autonomy needs, thereby reducing psychological well-being. Some studies have also confirmed the psychological distress^[31] and emotional exhaustion^[32] caused by COVID-19 stress to nurses; these factors consume a large number of psychological resources, thereby reducing psychological well-being. Employee well-being can reduce job burnout, improve work efficiency, and have an important impact on the survival and development of an organization^[33]. From a management practice perspective, happy employees have better performance and a lower turnover rate^[34], whereas those with lower psychological well-being have a higher turnover rate. Low psychological well-being means that individuals cannot meet self-competence, relationship and autonomy needs, and nurses with low psychological well-being may choose escape methods to alleviate the pain of unmet basic needs, for example higher turnover intention. Therefore, this study hypothesizes that:

H3: COVID-19 stress increases turnover intention by reducing psychological well-being.

2.4. The sequential mediating roles of psychological security and psychological well-being

When an employee is free to express himself or herself in an organization without fear of negative consequences, he/she feels safe. To cope with the stress of COVID-19, nurses have to consume more resources, and if these resources cannot be effectively replenished, then nurses will not have enough resources to present themselves. Furthermore, the COVID-19 pandemic has increased the complexity of nursing care, and nurses may not have sufficient knowledge, skills and competency resources to handle certain tasks. These 2 stressful situations cause nurses to feel insecure. A lack of security at work means the loss of key psychological resources, resulting in emotional exhaustion when dealing with stress, and organizational deviation due to decline in employees' self-regulation ability. These factors can lead to the creation of adverse psychological states, reducing psychological well-being and thus increasing the likelihood of leaving a job. Therefore, this study hypothesizes that:

H4: COVID-19 stress reduces nurses' psychological security, further reduces psychological well-being and increases turnover intention.

3. Method

3.1. Sample selection and data collection

This study collected questionnaires from 2 large hospitals in eastern and southern China. China's eastern and southern regions, characterized by high concentrations of economic activity and population, embody features representative of the country's diverse areas. Moreover, these two hospitals are large public general hospitals, which hold a leading position in China's healthcare system and possess high similarity and representativeness. Therefore, they can effectively reflect the working conditions and cultural background of Chinese nurses. We contacted the heads of the nursing departments of these two hospitals in advance, providing a detailed explanation of the study's purpose, anonymity, and data confidentiality, and obtained their support and assistance. All participants voluntarily participated in the study with informed consent. The department heads invited nurses to complete the questionnaires using an online questionnaire collection system. A total of 350 questionnaires were distributed. After excluding the questionnaires with the same answers, contradictory options and unreasonable logic, 319 questionnaires were included in the analysis, for an effective recovery rate of 91%. Among the respondents with valid questionnaires, females accounted for 93.7%; the most common age was 30-39 years (46.7%); the vast majority (72.1%) had a bachelor's degree; and the most common work experience was 11-20 years (33.9%).

3.2. Measurement

The scales for the main variables in this study were obtained from papers published in authoritative journals, and the "translation-back translation" procedure was adopted to ensure the linguistic integrity and intelligibility of scale items^[35]. All items on the scales were scored using a 5-point Likert scale, with 1 indicating strongly disagree and 5 indicating strongly agree.

COVID-19 stress: This scale was adapted from the 14-item stress scale compiled by Cohen et al. (1983)^[36]. In this study, considering the actual work situation faced by nurses, 6 items were selected to measure nurses' COVID-19 stress (for example, "I am very disturbed due to the COVID-19 pandemic").

In this study, the Cronbach's alpha coefficient for this scale was 0.923.

Turnover intention: The scale developed by Scott, CR et al. (1999) [37] was used; the instrument includes 4 items (for example, "I would prefer another more ideal job than the one I now work in"). In this study, the Cronbach's alpha coefficient of the scale was 0.815.

Psychological security: The scale developed by Li Ning and Yan Jin (2007) [38] was used; the instrument includes 5 items. To better measure the psychological security that affects turnover intention, we revised the original scale using expert opinions. There were 3 measurement items in the revised scale (for example, "My work environment is full of various potential threats"). In this study, the Cronbach's alpha coefficient of this scale was 0.781.

Psychological well-being: The scale developed d by Zheng, XM. et al. (2015) [39] was used; the instrument includes 6 items (for example, "I am good at flexibly arranging my time so that I can complete all the work"). In this study, the Cronbach's α coefficient of the scale was 0.946.

Control variables: Some studies have shown that demographic variables can affect the turnover intention of nurses; therefore, in this study, gender, age, education and years of work were used as control variables.

4. Results

4.1. Descriptive statistical analysis

The mean, standard deviation and Pearson correlation coefficient of each variable are shown in Table 1. As seen in Table 1, COVID-19 stress was significantly negatively correlated with psychological security ($r=-0.360$, $p<0.01$) and psychological well-being ($r=-0.429$, $p<0.01$), and significantly positively correlated with turnover intention ($r=0.422$, $p<0.01$). Psychological security was significantly positively correlated with psychological well-being ($r=0.402$, $p<0.01$) and significantly negatively correlated with turnover intention ($r=-0.515$, $p<0.01$). Psychological well-being was significantly negatively correlated with turnover intention ($r=-0.501$, $p<0.01$). The above results preliminarily support the hypothesis of this study; therefore, regression analysis can be carried out.

Table 1: Descriptive statistics and correlations between study variables.

	M	SD	1	2	3	4	5	6	7
1. Gen	1.94	0.24							
2. Age	2.89	0.94	0.148**						
3. Edu	2.74	0.48	0.102	0.048					
4. Ten	3.47	1.12	0.224**	0.863**	0.075				
5. CS	2.78	0.86	-0.131*	0.013	-0.011	0.033			
6. PS	3.78	0.87	0.142*	0.091	0.046	0.103	-0.360**		
7. PW	3.82	0.68	0.099	0.140*	0.077	0.138*	-0.429**	0.402**	
8. TI	2.21	0.84	-0.156**	-0.217**	0.053	-0.218**	0.422**	-0.515**	-0.501**

Note: CS=COVID-19 stress, PS=Psychological security, PW=Psychological well-being, TI=Turnover intention, ** $p<0.01$; * $p<0.05$

4.2. Confirmatory factor analysis

In this study, AMOS was used to test the goodness-of-fit of the measurement model. The analysis results are shown in Table 2. The fitting values of the models all fall within the recommended range. To ensure the content validity of the scales, the scales used in this study are all mature scales published by authoritative journals. Confirmatory factor analysis of the latent variables indicated that the standardized factor loading values for measurement items of the 4 factors of COVID-19 stress, psychological security, psychological well-being and turnover intention were all greater than the critical value of 0.5. As seen in Table 3, the combined reliability (CR) values of the 4 variables were all higher than the critical value of 0.8. The average variation extraction (AVE) of each latent variable was greater than the critical value of 0.5, indicating that each variable has good convergent validity. The square root of the AVE values of the 4 latent variables was greater than the correlation coefficient between the variable and other variables; therefore, there is a good discriminant validity between the 4 variables.

Table 2: Goodness-of-fit indices of the measurement model.

Goodness-of-fit index	χ^2	$(\chi^2)/df$	CFI	IFI	NFI	RMSEA
Measurement model	364.094	2.528	0.949	0.950	0.920	0.069

Table 3: Reliability and validity test results for the scales.

Variable	1	2	3	4	Combined reliability
1. COVID-19 stress	0.811				0.92
2. Psychological security	-0.360**	0.782			0.82
3. Psychological well-being	-0.429**	0.402**	0.867		0.95
4. Turnover intention	0.422**	-0.515**	-0.501**	0.736	0.82

Note: The bold numbers along the diagonal are the square roots of the AVE values; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

4.3. Common method bias analysis

In this study, a common method factor test was used to test the measurement model for common method bias. After adding the common method factor, confirmatory factor analysis was performed with all items of the 4 variables. The test results were as follows: Δ RMSEA=0.016, Δ NFI=0.028, Δ IFI=0.025, Δ CFI=0.025, and Δ TLI=0.025; the change value of the RMSEA fitting index did not exceed 0.05, and the change value of the NFI, IFI, CFI and TLI fitting indexes was less than the standard of 0.05. Based on the results of the above analysis, there is no serious common method bias problem in this study.

4.4. Hypothesis testing

In this paper, the mediation effect was tested using the three-step method. As seen in Table 4, (1) in Model 2, COVID-19 stress had a significant positive effect on the turnover intention of nurses ($\beta=0.421$, $p < 0.01$), H1 was supported; (2) in Model 5, COVID-19 stress was significantly negatively correlated with psychological security ($\beta=-0.353$, $p < 0.01$); and (3) in Model 3, after adding psychological security, psychological security was significantly negatively correlated with nurses' turnover intention ($\beta=-0.394$, $p < 0.01$), and the effect of COVID-19 stress was reduced ($\beta=0.281$, $p < 0.01$). The above analysis results suggest that psychological security plays a partial mediating role between COVID-19 stress and nurses' turnover intention, H2 was supported. Similarly, it can be verified from Model 2, Model 6 and Model 4 that psychological well-being also plays a partial mediating role, H3 was supported.

Table 4: Multiple linear regression analysis results.

Variable	TI				PS	PW
	M1	M2	M3	M4	M5	M6
Gen	-0.126*	-0.063	-0.035	-0.061	0.071	0.007
Age	-0.129	-0.091	-0.091	-0.069	0.001	0.060
Edu	0.078	0.079	0.090*	0.102*	0.027	0.061
Ten	-0.084	-0.145	-0.107	-0.110	0.096	0.094
CS		0.421**	0.281**	0.263**	-0.353**	-0.431**
PS			-0.394**			
PW				-0.365**		
R ²	0.070	0.243	0.375	0.348	0.148	0.211
Adjusted R ²	0.058	0.231	0.363	0.335	0.135	0.199
F	5.915	20.081**	31.191**	27.740**	10.911**	16.773**

Note: CS=COVID-19 stress, PS=Psychological security, PW=Psychological well-being, TI=Turnover intention, ** $p < 0.01$; * $p < 0.05$

To further verify the mediating effect of psychological security and psychological well-being, the 95% confidence interval (CI) method was adopted to test the mediating role of psychological security and psychological well-being. The results as seen in Table 5 show that psychological security had a significant mediating effect between COVID-19 stress and turnover intention (indirect utility value=0.1172, 95% CI=[0.0623, 0.1899]>0), H2 was further supported; psychological well-being had a significant mediating effect between COVID-19 stress and turnover intention (indirect utility value=0.0922, 95% CI=[0.0452, 0.1459]>0), H3 was further supported; and the sequential mediating

effect of psychological security and psychological well-being was significant (indirect utility value=0.0289, 95% CI=[0.0115, 0.0551]>0), H4 was supported.

Table 5: The mediating effect of variables.

Paths	Indirect effect	Mediating effect	
		95% CI	
COVID-19 stress → Psychological security → Turnover intention	0.1172	0.0623	0.1899
COVID-19 stress → Psychological well-being → Turnover intention	0.0922	0.0452	0.1459
COVID-19 stress → Psychological security → Psychological well-being → Turnover intention	0.0289	0.0115	0.0551

5. Discussion

5.1. Theoretical contributions

This study offers several significant theoretical contributions. First, it extends the literature on nurse turnover intention by examining the impact of pandemic-induced stress in crisis situations, thereby expanding our understanding of turnover antecedents. Second, it advances psychological security research by investigating its role during the COVID-19 pandemic, particularly focusing on healthcare professionals facing substantial psychological threats. Third, this study elucidates the mechanism through which COVID-19 stress influences nurse turnover intention. While previous research has identified work-family conflict, emotional exhaustion, and job burnout as factors affecting nurse turnover [19,48], this study reveals a novel pathway: COVID-19 stress disrupts nurses' psychological security, diminishes psychological well-being, and consequently increases turnover intention. This mechanistic insight enriches our understanding of stress-induced turnover in healthcare settings.

5.2. Management implications

This study yields several practical implications for hospital management. The findings demonstrate that COVID-19 stress increases turnover intention through diminished psychological security, suggesting the need for comprehensive support systems. Hospital administrators should implement stress-mitigation strategies, including optimized work schedules, adequate protective equipment, and psychological support services. Additionally, enhancing psychological security requires institutional support through professional development opportunities, clear career advancement pathways, and competitive compensation packages. To promote psychological well-being, hospitals should focus on creating supportive work environments that foster team cohesion, facilitate effective cross-departmental communication, and align with nurses' professional identities.

5.3. Limitations and prospects

Several limitations warrant consideration. First, while this study examines turnover intention in healthcare settings, it does not fully account for the Chinese cultural context, where collectivism and relationship-oriented dynamics significantly influence workplace behavior. The interplay between cultural factors and COVID-19 stress merits further investigation. Second, the cross-sectional design limits causal inference regarding the relationships among study variables. Future research would benefit from longitudinal or experimental approaches to establish causality. Third, the reliance on self-reported data may introduce common method bias. Future studies should consider multiple data sources and mixed-method approaches to enhance methodological rigor. These limitations present opportunities for future research to deepen our understanding of healthcare worker turnover in crisis situations.

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