ORIGINAL RESEARCH

Influence of nursing interns' resilience on burnout: Mediating effects of well-being

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ABSTRACT

Objective: This study examined the relationship between well-being, psychological resilience, and burnout among nursing interns in China.

Methods: A cross-sectional study was carried out at 2 tertiary hospitals in Guangdong Province, China. Data were collected from 360 nursing interns using a structured questionnaire, and structural equation modeling was used to analyze the correlation between well-being, resilience, and burnout.

Results: Participants' burnout score was in the upper range (mean [M]=12.748, standard deviation [SD] = 6.654). Burnout was negatively correlated with resilience (r = -0.477, $p < .01$) and well-being (r = -0.573, $p < .01$). Well-being mediated the relationship between resilience and burnout.

Conclusions: Resilience and well-being are inversely correlated with burnout, and well-being mediates the relationship between resilience and burnout. Improving well-being can reduce burnout risk and improve resilience among nursing interns. To prevent burnout among nursing interns, nursing managers should aim to improve their well-being by optimizing the work environment, promoting the cohesion of the nursing team, actively guiding and providing necessary help, and supporting the development of each intern's nursing career.

Key Words: Nursing students, Burnout, Well-being, Resilience, Mediating effect

1. INTRODUCTION

In accordance with the National Nursing Development Plan (2021–2025), the total number of registered nurses in China was more than 4.7 million by the end of 2020. However, the development of China's nursing workforce remains inadequate and there is an insufficient number of nurses to meet the health needs of the population, especially in light of the country's rapid economic and social development.[1] Nursing has always been a sector with a high turnover rate and maintaining a stable nursing workforce is a major challenge for health systems in many countries including China. As high-quality talent poised to enter this sector, nursing interns are an important and valuable human resource in the labor market.[2] However, as newcomers to the clinical work setting, interns encounter a high degree of role stress.[3] When the frequency and duration of stressors exceed their ability to cope, interns may experience premature burnout and resolve to leave nursing education.[4] One study of nursing students in Turkey found that 35% experienced burnout before their internship, with the proportion increasing to 44% after the

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internship.[5] Burnout can result in adverse outcomes for hospitals such as loss of cohesion among staff, reduced work efficiency and job performance, and attrition.[6] Thus, a challenge for hospitals and the medical profession is preventing burnout among nursing interns to ensure the work productivity of nursing staff and the overall quality of nursing care.

Practical clinical experience is an important component of nursing education.[4] In China, all nursing students are required to complete at least 32 consecutive weeks (1280 h) of clinical training in their final year of study.[4] During the training, students encounter many stressful situations that could lead to burnout such as a new environment, difficult patients, and trauma, in addition to having to manage their own fear of making a mistake while knowing that they are being evaluated by instructors.[5] Burnout is a psychological syndrome involving emotional exhaustion, feelings of helplessness, depersonalization, negative attitudes toward work and life, and a reduced sense of personal accomplishment.[7] It was reported that Asian nursing interns (40%) had a higher pooled prevalence of burnout than interns from Europe (23%) and South America (14%).[8] Burnout can also affect interpersonal skills, job performance, career satisfaction, and psychological health.[9] Given the high prevalence and negative impact, effective interventions for burnout are needed, which requires a deeper understanding of the contributing factors.[8]

Psychosocial resilience is a complex phenomenon that is broadly defined as the ability to positively adapt to adversity in a way that promotes growth and well-being. Individuals with a high degree of resilience are more likely to recover from negative experiences and are better able to adapt to their circumstances[6] and maintain a positive attitude when faced with adversity.[6] Total resilience score as measured by the Connor–Davidson resilience scale and characteristics associated with resilience were shown to be significantly and negatively correlated with 3 indicators of burnout—namely, clinical practice stress, social support, and work environment.[1, 10] Training nurses to develop resilience can potentially reduce burnout and increase their retention in the workforce.[12]

Well-being is a subjective concept encompassing life satisfaction, pleasant effects, and unpleasant effects.[13] Resilience and its various dimensions are significantly and positively correlated with well-being,[4] and nursing interns with a high level of resilience were shown to have higher perceived well-being.[13] A high level of resilience may enhance positive intrapersonal and interpersonal strengths and facilitate a sense of well-being.[14] Research on burnout among nurses has shown that there is a significant negative association between happiness and burnout among nurses, indicating that higher levels of happiness correspond to lower burnout scores (both total scores and scores for each subscale).[15] Thus, resilience not only directly impacts the level of burnout of nursing interns, but may also have an indirect effect through happiness.

The present study examined the relationship between psychological resilience and burnout and the role of well-being among nursing interns, a population that is susceptible to burnout. The conceptual basis of the study was the Job Demand-Resource Model (JD-R),[16] which posits that adequate internal psychological resources can help individuals cope more effectively with the work environment, improve their work engagement, and ultimately reduce the risk of burnout. Besides resilience, emotions, personality, cognition, and degree of work engagement are internal work resources that can impact an individual's motivation level in the workplace.[16, 17] We tested the following hypotheses:
(1) There is a significant negative correlation between psychological resilience and burnout among nursing interns.
(2) Well-being plays a mediating role in the relationship between resilience and burnout.

2. METHODS

2.1 Setting and participants

This descriptive study included nursing interns receiving training at 2 tertiary hospitals in Guangzhou, Guangdong Province, China. The minimum sample size to construct a stable model is 200;[18] we therefore aimed to collect at least 200 valid questionnaires. Participants were recruited by convenience and snowball sampling.[19] We contacted and received approval from the director of the nursing department who was responsible for teaching at the hospital. One researcher informed the participants about the study methods and protection of their rights. Questionnaires were distributed to participants after obtaining their informed consent. The structured questionnaire contained 4 sections: demographic characteristics, psychological resilience, well-being index, and burnout. All assessment tools were adapted from published studies. Survey data were collected online by sending an electronic questionnaire via WeChat, a social network widely used in China. A total of 360 participants were surveyed who met the following criteria: 1) nursing student who had been interning for at least 3 months; 2) enrolled in a full-time bachelor or specialist degree program; and 3) gave informed consent and voluntarily participated in the survey.

2.2 Instruments

Demographic characteristics Participants' demographic data included sex, birthplace, educational background, personality type, intern cadres, major selection method, school achieve-

ments, family support for studying nursing, professional satisfaction, duration of the internship, internship hospital level, satisfaction with internship management, satisfaction with nursing teaching, and satisfaction with the internship environment.

2.2.1 *Psychosocial resilience*

The instrument used to assess psychological resilience was a revised version[20] of the Connor–Davidson resilience scale.[21] The scale comprises 3 dimensions and 25 items: resilience (13 items), tenacity (8 items), and optimism (4 items). All items used a 5-point Likert rating scale where 0 represented "Never" and 4 represented "Always". Scores between 0 and 56 indicated a low level of resilience; scores between 57 and 70 indicated moderate resilience; and a score ≥ 71 indicated high resilience. The Cronbach's α of the scale in this study was 0.89. This survey was previously deemed reliable with an internal consistency reliability of 0.94.

2.2.2 *Index of well-being*

The Chinese translation[22] of the Satisfaction with Life Scale[23] consists of 9 items: 8 for overall affective index and 1 for life satisfaction. The scale is used to measure the participant's current level of experienced happiness. All items used a 7-point Likert scale, the first 8 items had equal weight (1 point each), and the last item weighed 1.1 points. The total score for subjective well-being was calculated by averaging the scores of the first 8 items and adding the score of the last item multiplied by 1.1. The total score ranged from 2.1 points (Least happy) to 14.7 points (Most happy), with the midpoint as the average score and a higher score indicating a stronger sense of subjective well-being. The Cronbach's α of the scale in this study was 0.89.

2.2.3 *Burnout*

The burnout scale developed by Maslach[7] and revised by Chaoping Li[37] consists of 15 items categorized into 3 dimensions: emotional exhaustion, cynicism, and reduced personal accomplishment. Emotional exhaustion refers to an individual's perception that all of their emotional resources have been depleted, resulting in a lack of motivation toward work, feelings of frustration, tension, and even fear of work. This section comprised 5 items (e.g., Item 2: "I feel exhausted at the end of the workday"). Cynicism refers to an individual's deliberate distancing from work and work-related individuals, a lack of enthusiasm for and involvement in work, and a skeptical attitude toward the meaning of the work. This section comprised 5 items (e.g., Item 7: "I am not as enthusiastic about work as I used to be"). Reduced personal accomplishment refers to an individual's negative self-evaluation of their ability to perform their job effectively. This section

included 6 items (e.g., Item 15: "I am confident in my ability to complete tasks effectively"). All items used a 7-point Likert scale, where 0 represented "Never" and 6 represented "Always". To facilitate comparison, the reduced personal accomplishment section was reverse scored, with the total score calculated by summing the scores of all items in each dimension and a higher score indicating more severe burnout. The 3 dimensions of this scale had reliability coefficients ranging from 0.67 to 0.87, indicating good validity.

2.3 Data analysis

Statistical analyses of the data were performed using Excel (Microsoft, Redmond, WA, USA), SPSS 22.0 (SPSS Inc, Chicago, IL, USA), and AMOS software (IBM, Armonk, New York, NY, USA). Invalid questionnaires were removed in Excel, leaving 332 valid questionnaires. Descriptive statistics such as mean (M), and standard deviation (SD) were used to describe continuous variables according to whether they showed a normal or non-normal distribution. Frequency and composition ratio were used to describe categorical variables. A multivariate linear regression model was used to identify factors influencing burnout in participants, and Pearson's correlation was used for correlation analyses. Tests were 2-tailed and a p value $< .05$ was considered statistically significant. Structural equation modeling was performed using AMOS software to evaluate the relationships between resilience, burnout, and well-being. The mediating effect of well-being on the association between resilience and burnout was also assessed. Percentile bootstrap confidence intervals (CIs) were calculated based on 5000 samples.

2.4 Ethical considerations

This study was approved by the Ethics Committee of Southern Medical University and was conducted in accordance with the Declaration of Helsinki and American Psychological Association ethical standards. Written, informed consent was obtained from each participant.

3. RESULTS

3.1 Participants' general characteristics

The mean (SD) age of study participants was 21.14 (1.15) years; most (88.3%) were women (see Table 1). Most interns were self-selected nursing majors, 52.1% had > 6 months of nursing internship, and 78.6% were satisfied with the internship environment.

Table 1. Demographic characteristics of the study participants (N = 332)

Variable	n (%)
Sex	
Male	39 (11.7)
Female	293 (88.3)
Birthplace	
Countryside	219 (66.0)
City	113 (34.0)
Education level	
Undergraduate	166 (50.0)
Junior college	166 (50.0)
Personality type	
Extravert	182 (54.82)
Introvert	150 (45.18)
Intern cadres	
Yes	103 (31.0)
No	229 (69.0)
Major selection method	
Autonomy	233 (70.2)
Adjustment	99 (29.8)
Academic achievements	
Upper (top 40%)	143 (43.1)
Medium (40%–60%)	132 (39.7)
Lower (bottom 40%)	57 (17.2)
Family support for studying nursing	
Very supportive	46 (13.9)
Supportive	230 (69.3)
Unsupportive	48 (14.5)
Very unsupportive	8 (2.4)
Professional satisfaction	
Very satisfied	13 (3.9)
Satisfied	212 (63.9)
Dissatisfied	93 (28.0)
Very dissatisfied	14 (4.2)
Duration of internship (months)	
1–3	11 (3.3)
4–6	148 (44.6)
≥7	173 (52.1)
Internship hospital level	
Upper first-class hospital	320 (96.4)
Middle first-class hospital	6 (1.8)
Upper second-class hospital	3 (0.9)
Middle second-class hospital	3 (0.9)
Satisfaction with internship management	
Very satisfied	28 (8.4)
Satisfied	228 (68.7)
Dissatisfied	66 (19.9)
Very dissatisfied	10 (3.0)
Satisfaction with nursing teaching	
Very satisfied	43 (13.0)
Satisfied	242 (72.9)
Dissatisfied	41 (12.3)
Very dissatisfied	6 (1.8)
Satisfaction with the internship environment	
Very satisfied	31 (9.3)
Satisfied	230 (69.3)
Dissatisfied	62 (18.7)
Very dissatisfied	9 (2.7)

3.2 Multivariate linear regression

Considering the absence of multicollinearity among variables, we developed a multivariate linear regression model that included all sociodemographic characteristics as independent variables and burnout as the dependent variable. Intern cadre, professional satisfaction, and satisfaction with internship management were significantly associated with burnout ($p \leq .001$) (see Table 2). The final model explained 43.8% of the variance in burnout ($p \leq .001$).

Table 2. Multivariate linear regression analysis of factors influencing job burnout (N = 332)

Variable	β	t	p
Constant term	−8.616	−5.797	.000
Intern cadres	1.985	3.315	.001
Professional satisfaction	5.114	10.317	.001
Satisfaction with internship management	2.814	5.665	.000

Notes. $R^2 = 0.443$; adjusted $R^2 = 0.438$; F = 87.095; $p < .001$.

3.3 Correlation analysis

Nursing interns perceived themselves as having a relatively high level of well-being (M = 10.038, SD = 2.674). Resiliency was moderate (M = 58.581, SD = 15.282) whereas burnout score was in the upper range (M = 12.748, SD = 6.654). Burnout was negatively correlated with resilience (r = -0.477, $p \leq .01$) and well-being index (r = -0.573, $p \leq .01$), whereas resilience was positively correlated with well-being index (r = 0.581, $p \leq .01$).

3.4 Structural equation model

There was a significant correlation between resilience, burnout, and well-being. The path coefficients for the effects of resilience on the well-being index, resilience on burnout, and well-being index on burnout were 0.64, -0.26, and -0.48, respectively; all values were significant ($p \leq 0.001$) (see Table 3). Our hypothesized model showed a good fit, with minimum chi-squared estimation/degrees of freedom of 3.260, goodness of fit (GFI) of 0.961, adjusted GFI of 0.911, comparative fit index of 0.909, incremental fit index of 0.912, and root mean square error of approximation of 0.083. All of these values met the model fit requirements and confirmed the mediating effect of well-being on the relationship between resilience and burnout (see Figure 1). Specifically, the indirect effect and 95% CI—calculated using a bootstrapping method with 5,000 resamples—did not include 0 (95% CI: -0.424, -0.199), indicating that the mediating effect was significant (see Table 4). This result further supported the hypothesis that well-being impacted the association between resilience and burnout.

Table 3. Normalized path coefficients

Path	Normalized path coefficient	SE	CR	p
Resilience → Well-being	0.637	0.040	10.598	≤ .001
Well-being → Burnout	−0.477	0.373	−6.975	≤ .001
Resilience → Burnout	−0.265	0.252	−3.800	≤ .001

Notes. CR, composition ratio; SE, standard error.

4. DISCUSSION

The mean burnout score of participants in this study (13) was lower than the values reported in previous studies of nurses or undergraduate students.[2, 24] This could be related to the high proportion of interns (70%) who were satisfied with the internship management. Multiple linear regression models showed that intern cadres, professional satisfaction, and satisfaction with internship management were highly predictive of burnout. That is, nursing interns who served as intern cadres had a lower level of burnout, possibly because they had more opportunities for interaction and communication with teachers and were frequently organizing and participating in various activities that involved interacting with others. This allowed them to receive information from external sources and thus have a richer educational experience, which not only helped them establish a social support system but also enhanced their internal integration ability.[18] Interns who were less satisfied with the nursing profession had higher levels of burnout.[25] In China, many pre-medical students transfer to the nursing program because their grades do not meet the standards of their major, with the result that a nursing degree is not highly regarded.[26] Therefore, measures should be implemented in nursing education to improve interns' sense of professional satisfaction and self-worth such as emphasizing professional ideology and strengthening their role definition and social support system.[2, 27] Additionally, a positive clinical practice environment and favorable work characteristics can lower burnout and improve nursing service quality.[28] By improving the work environment and increasing internship management satisfaction, the incidence of occupational burnout among nursing interns can be reduced.
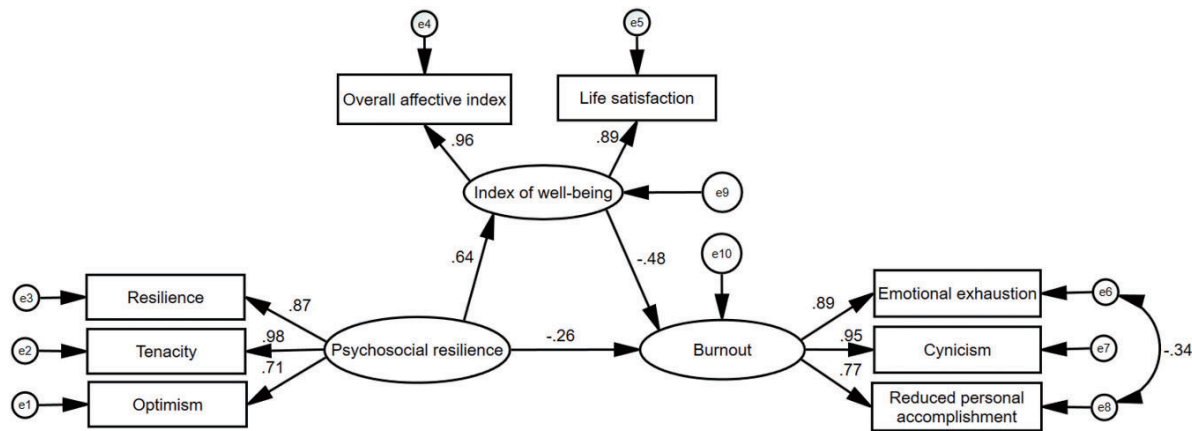
Figure 1. Estimation of the structural model with standardized coefficients

Table 4. Bootstrap test of the mediating effect of well-being on the relationship between resilience and burnout

Item	Standardized effect (β)	Standard error	Bootstrap 95% confidence interval
Gross effect	−0.568	0.062	[−0.699, −0.416]
Direct effect	−0.265	0.088	[−0.425, −0.077]
Indirect effect	−0.304	0.057	[−0.424, −0.199]

Notes. Data are based on 5000 bootstrap samples.

According to the JD-R model, burnout results from an imbalance between job resources and demands.[29] Resilience is a personal resource that can motivate individuals to actively overcome difficulties, maintain optimism in challenging situations, and balance the negative effects of work demands.[30] Based on the JD-R model, we hypothesized that burnout among nursing interns could be reduced by increasing their resilience. The results of our analyses confirmed the negative correlation between resilience and burnout, consistent with previous work.[31] It is well known that resilience can be learned and developed later in life; given that it can reduce burnout, nursing interns would benefit from strategies

to increase resilience such as building positive relationships, maintaining positivity, cultivating emotional intuition, and ensuring work-life balance.[32]

In the JD-R model, well-being influences the relationship between resilience and burnout. We found that resilience impacted burnout among nursing interns directly but also indirectly through well-being. That is, a high degree of well-being can synergize with resilience to reduce burnout. It has been reported that nursing students' well-being during clinical internships had a significant effect on learning outcomes, retention, and attrition.[33] Interns with a high score on the well-being index were better able to enjoy their studies, leading to self-confidence and excitement, an interest in new topics or situations, and a high level of energy and motivation to succeed in clinical practice.[34] Well-being is a holistic concept that includes mental, emotional, spiritual, and psychological dimensions and is highly correlated with resilience.[35] A high level of resilience has been identified as a strong predictor of well-being,[36] which was supported by our study. As such, there is a need for educational strategies to develop and enhance resilience among nursing students, especially during clinical internships. For example, as physical activity has been suggested as an intervention to improve nursing trainees' well-being,[34] exercise could be incorporated into the learning environment and encouraged among students, interns, and young professionals as a part of good nursing practice.

Various factors were found to directly or indirectly contribute to burnout among nursing interns, including intern cadre, professional satisfaction, and satisfaction with internship management. Resilience and well-being were inversely correlated with burnout, and well-being was found to mediate the relationship between resilience and burnout. Thus, promoting well-being can potentially improve resilience and reduce burnout in nursing interns. Based on these findings, hospital nursing managers can improve the stability of the nursing team and the well-being of nursing interns by helping the latter respond to work needs and providing emotional and organizational support, which can alleviate occupational fatigue, increase interns' satisfaction with the nursing profession, and reduce their risk of burnout.

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AUTHORS CONTRIBUTIONS
Juan li was responsible for study design and revising. Minrui Li was responsible for data collection. Junli Ye rafted the manuscript and Prof. Huimin Zhai revised it. All authors read and approved the final manuscript. All authors made substantial contributions to the conception or design of the work.

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The authors declare that there is no conflict of interest.

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No additional data are available.

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