Research Square

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Coping Styles as a Mediator between Psychological Resilience and Psychological Distress in Perimenopausal Nurses: Evidence from China

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Abstract

Objectives

This research was designed to investigate the effect of psychological resilience on psychological distress Chinese nurses in perimenopause, alongside exploring the potential mediating role that coping strategies may play within this association.

Methods

A study utilizing a cross-sectional design was carried out in Sichuan Province, China, in November 2022. In total, 514 perimenopausal nurses were evaluated through the Kessler Psychological Distress Scale, the Connor–Davidson Resilience Scale, and the Simplified Coping Style Questionnaire. Structural equation modeling was used to test coping style as a mediator between resilience and mental distress.

Results

The psychological resilience of perimenopausal nurses demonstrated a negative predictive effect on psychological distress. Coping style served as a partial mediator in the connection between psychological distress and resilience, with the mediating influence of positive coping being more prominent. Pearson's correlation analysis indicated that psychological resilience was positively associated with positive coping styles ($r = 0.583$, $p < 0.01$), but negatively link with psychological distress ($r = -0.584$, $p < 0.01$) and negative coping ($r = -0.221$, $p < 0.01$). Furthermore, psychological distress showed a negative correlation with positive coping ($r = -0.604$, $p < 0.01$) and a positive correlation with negative coping ($r = 0.435$, $p < 0.01$).

Conclusion

These results suggest that enhancing the level of mental resilience and adopting positive coping styles may be effective measures to reduce the psychological distress of perimenopausal nurses.

Background

Perimenopause[1] is a transitional period during which women move from the fertile phase to the non-fertile phase, extending until one year following the final menstrual cycle and generally occurring between 40 and 55 years of age. As ovarian function gradually diminishes and the estrogen regulatory system becomes impaired, women in the perimenopausal stage are at increased risk not only for conditions such as cardiovascular disease, diabetes, stroke, and Alzheimer's disease[2], but also for experiencing varying levels of psychological distress.

In general, occupational stress can lead to psychological distress[3]. Chinese nurse are faced with a variety of stressors such as high-intensity, high-risk work, and complex interpersonal relationships, which lead to their widespread psychological distress[4]. Higher levels of psychological distress can seriously affect their quality of life and work performance[5]. In addition, according to the stress-emotion theory, individuals who perceive work pressure will experience negative emotional responses[6]. Perimenopausal nurses, who are often at the end of their careers, face complex pressures such as the degradation of physical function, family role pressures, concerns about retirement and unemployment, and the implementation of the postponement policy. Perimenopausal nurses could experience higher levels of psychological distress because of these stresses. Clinical nurses play an indispensable role in medical services. Their physical and mental health is positively correlated with nursing quality, patient health, quality of life, and human resource costs of healthcare institutions[7]. Thus, psychological distress among perimenopausal nurses cannot be ignored, and it is essential to focus on their physical and mental health.

Psychological distress is the non-adaptive psychological function changes that occur when individuals face stressful events[8–10], mainly reflected in mental symptoms such as depression, anxiety, and stress, and physical symptoms like insomnia and cognitive impairment. So far, there are many researches on protective factors related to psychological distress[11, 12]. Psychological resilience is a very important variable among the many protective factors[13]. Psychological resilience refers to an individual's ability or quality to successfully adapt and maintain mental health in the face of stressors (e.g., adversity, tragedy, threat)[14], which is a potential protective factor that can reduce psychological problems and directly predict the level of psychological distress[15]. Previous studies have indicated that psychological resilience contributes to improved mental well-being, particularly by alleviating symptoms of psychological distress and buffering the adverse effects of stress on mental health[16, 17].

Coping style is the behavioral approach individuals use to response to stressful events, involving cognitive regulatory methods and strategies[18]. Existing studies have shown that coping strategies have been identified as individual factors that improve resilience[12]. Individuals with lower levels of resilience are inclined to engage in maladaptive coping when confronted with stress, whereas those with higher resilience are inclined to utilize constructive coping strategies. Additionally, positive coping style can effectively manage stress and negative life events, thereby reducing psychological problems and improving quality of life[19, 20]. However, a negative coping style can shorten the level of mental health[21]. The role of coping style as an intermediary variable affecting individual mental health has been confirmed[22–24].

In summary, we advance the following hypotheses: (1) psychological resilience among perimenopausal nurses exerts a direct influence on psychological distress, with a negative association expected between the two; and (2) psychological resilience indirectly impacts the degree of distress through coping strategies (the hypotheses are illustrated in Fig. 1). Currently, there are few studies that explore the interplay of psychological resilience, coping style, and psychological distress in perimenopausal nurses. This study therefore centers on this group to investigate how psychological resilience shapes distress

while assessing the mediating role of coping styles. The objective of this study is to provide a theoretical basis for hospital administrators to formulate intervention strategies for perimenopausal nurses experiencing psychological distress.

Methods

1.1 Design. This cross-sectional investigation was documented in accordance with the STROBE reporting guidelines for observational studies[25].

1.2 Participants and Sampling. The study was carried out across five tertiary hospitals in Chengdu, Sichuan Province, China, between November 2022 and June 2023. Perimenopausal nurses were recruited for this study utilizing a convenience sampling method. Eligibility for study participation required meeting the following criteria: (a) fulfillment of the WHO Perimenopause Study Group's definition of perimenopause[26]: 40~55 years old, and occurrence of menstrual disturbances: a change of ≥7 days in the length of two adjacent menstrual cycles within 10 menstrual cycles, or menopause within 1 year; (b) registered nurse: working as a clinical nurse for ≥5 years; (c) informed consent: volunteered for this study. Exclusion criteria as follows: (a) developing a serious bodily disease, such as cancer; (b) menopause more than 1 year ago or regular menstruation within the past 12 months without any signs of menopause; (c) currently taking antipsychotic drugs, such as anxiolytics and antidepressants. According to the Kendall[27], a study typically requires a sample size that is five to ten times the number of independent variables in the model. In our study, a total of 24 variables were included. The sample size was estimated using the formula: N= variables*10. Accounting for an anticipated 20% nonresponse rate, a minimum of 300 participants was deemed necessary. Ultimately, 548 questionnaires were disseminated, from which 514 usable responses were collected, with an effective retrieval rate of 93.8%.

1.3 Measures

1.3.1 Participants' sociodemographic characteristics. A researcher-developed questionnaire was utilized to gather participants' information, including age, education level, marital status, spouse's health status, suffer from chronic disease, professional title, years of work experience, work department, personality traits, and negative life events (within the past year).

1.3.2 Psychological distress. The levels of psychological distress were evaluated using the 10-item Kessler Measure of Psychological Distress (K10)[28]. The Chinese version of K10[29] was employed to assess the frequency of non-specific mental health symptoms, including anxiety and stress, experienced by participants over the past four weeks. The total score ranges from 0 to 50, with higher scores reflecting greater levels of psychological distress. The scale uses a 5-point Likert format and classifies distress into four levels: none (<15), mild (≥16), moderate (≥22), and severe (≥30). The scale of Cronbach's α was 0.92 in present study.

1.3.3 Psychological resilience. The assessment of psychological resilience was conducted by employing the Connor–Davidson Resilience Scale (CD-RISC)[30]. The Chinese version of the CD-RISC scale[31] comprises three dimensions: strength (e.g., adaptability to change), tenacity (e.g., persistence when facing adversity), and optimism (e.g., finding humor in situations), totaling 25 items. It primarily assesses individuals' capacity to recover from stressful events in the past month. Higher total scores reflect greater resilience when confronting stress. The scale of Cronbach's α was 0.90 in the current study.

1.3.4 Coping style. Participants' coping strategies were evaluated using the Simplified Coping Style Questionnaire (SCSQ)[32]. This scale measures cognitive and behavioral responses to stress and adversity, comprising two dimensions: positive coping (12 items) and negative coping (8 items), for a total of 20 items. Taller scores on the positive coping subscale show a greater likelihood of employing constructive coping strategies, whereas taller scores on the negative coping subscale reflect a stronger tendency to rely on negative coping approaches. The Chinese SCSQ[33] exhibited strong internal consistency in the present investigation, with a Cronbach's α of 0.774.

1.4 Data collection procedures. A star survey questionnaire was utilized in our study. Firstly, a total of 30 perimenopausal nurses who satisfied the inclusion and discharge criteria were selected for pre-investigation. The results showed that it took 5-10 minutes to complete a questionnaire. Cronbach's α coefficients for the CD-RISC, SCSQ and K10 separately were 0.919, 0.843 and 0.910, demonstrating good internal consistency. The final questionnaire was developed after debugging, testing reliability and validity, and adjusting questionnaire items based on initial electronic questionnaire responses. Simultaneously, team members received training in relevant knowledge. Before the investigation, the purpose, methods, and significance were explained to research subjects, and uniform guidance was provided for each scale. After obtaining informed consent from the investigating agency and research subjects, responses were collected anonymously. Throughout the survey, consistent explanations were provided for questions individuals did not understand. After completing the survey, two researchers independently reviewed, summarized, cross-checked, and randomly verified 10% to 20% of the surveys. Questionnaires were excluded if they had short completion times, missing items, obvious logical errors, identical responses, or the same IP address.

1.5 Statistical analysis. Analyses were performed using SPSS 25.0. Continuous variables were summarized as mean ± standard deviation according to data type and normality test results, while categorical variables were expressed as frequencies and percentages (%). Pearson's correlation analysis was conducted to assess the relationships among psychological distress, psychological resilience, and coping styles. Structural equation modeling was conducted using AMOS 25.0, with parameters estimated via the Maximum Likelihood (ML) method. The bias-corrected bootstrap procedure with 5,000 resamples was applicable to ensure robust estimation. Statistical significance was set at $p < 0.05$ (two-tailed).

1.6 Ethics Statement. This investigation was carried out in full compliance with the ethical guidelines set forth in the Declaration of Helsinki. The research process adhered rigorously to the fundamental ethical principles of voluntariness, non-maleficence, justice, and privacy protection. Written informed consent was duly secured from all participating subjects. Furthermore, ethical approval for the study was granted by the Medical Ethics Committee of the Affiliated Hospital of Chengdu University of Traditional Chinese Medicine, Sichuan Province, China (Approval No. 2023KL-098).

Results

2.1 The demographic characteristics of the participants. Among the 514 participants, 49.6% of perimenopausal nurses were aged between 45 and 50 years. Most had an associate degree or lower (54.86%), were married (84.82%), had a healthy spouse (70.43%), were senior nurses (58.17%), had been working for 20 to 30 years (60.12%), and worked in surgical departments (23.35%). Extroverted and introverted perimenopausal nurses constituted 35.02% and 23.73%, respectively. Only 14.6% of perimenopausal nurses reported experiencing negative life events within the past year (Table 1).

TABLE1 Sociodemographic characteristics and univariate analyses of factors related to participants' psychological distress scores (n=514)

Variables	n (%)	Psychological distress scores (M± SD)	*t/F*	*P*	LSD test
Age			0.686	0.504	
40–45	203(39.50)	2.66±0.83			
46–50	255(49.60)	2.57±0.82			
51–55	56(10.90)	2.58±0.91			
Education level			0.363	0.717	
Associate degree or less	282(54.86)	2.63±0.86			
Bachelor degree or above	232(45.14)	2.60±0.81			
Marital status			0.666	0.573	
Unmarried	33(6.42)	2.77±0.79			
Married	436(84.82)	2.62±0.83			
Divorced	38(7.39)	2.50±0.95			
widowed	7(1.36)	2.51±0.63			
Spouse's health status			7.364	0.001	b–a,c
Health[a]	362(70.43)	2.55±0.78			
Suffer from chronic disease[b]	86(16.73)	2.92±1.01			
uninvolved[c]	66(12.84)	2.61±0.81			
Professional title			0.577	0.562	
Nurse	65(12.65)	2.62±0.83			
Senior nurse	299(58.17)	2.59±0.81			
Nurse supervisor or above	150(29.18)	2.68±0.88			
Years of work experience			0.617	0.540	
–20	83(16.15)	2.60±0.75			
20–30	309(60.12)	2.65±0.84			
–30	122(23.73)	2.55±0.87			
Department			1.045	0.395	
Internal department	106(20.62)	2.61±0.87			

Surgical department	120(23.35)	2.62±0.80			
Emergency department	52(10.12)	2.56±0.84			
Intensive care unit	47(9.14)	2.56±0.84			
Gynecology and Pediatrics department	85(16.54)	2.48±0.81			
Surgery	24(4.67)	2.53±0.73			
Outpatient clinic and Others	80(15.56)	2.75±0.87			
Personality traits			2.125	0.120	
Introverted	122(23.73)	2.71±0.87			
Extroverted	180(35.02)	2.66±0.85			
Unclear	212(41.25)	2.53±0.79			
Negative life events (within 1 year)			-4.08	0.000	b□a
No[a]	438(85.40)	2.56±0.82			
Yes[b]	76(14.60)	2.97±0.82			

NOTE: superscript letters denote significant intergroup differences decided by one-way ANOVA with LSD post hoc comparisons.

Suffer from chronic disease: hypertension, diabetes, coronary heart disease, etc.

Negative life events (within 1 year): medical disputes, marital crisis, death of family members, traffic accidents, death of children, etc.

2.2 Scores and pearson's correlation analysis. The mean psychological resilience score of perimenopausal nurses was 64.01 ± 10.39. The average scores for positive coping, negative coping, and psychological distress were 24.05 ± 3.93, 12.25 ± 2.93, and 26.17 ± 8.34, respectively. The prevalence of psychological distress was 92.8% (477/514). Pearson's correlation analysis manifested that psychological resilience exhibited a significant positive relationship with positive coping ($r = 0.583$, $p < 0.01$), while it was inversely related to psychological distress ($r = -0.584$, $p < 0.01$) and negative coping ($r = -0.221$, $p < 0.01$). Moreover, psychological distress revealed a significant negative association with

positive coping (r = −0.604, p < 0.01) and a positive association with negative coping (r = 0.435, p < 0.01), as presented in Table 2.

TABLE2 Descriptive statistics and variable correlations(n=514)

	M(SD)	1	2	3	4	5	6	7
1. PD	36.30(4.15)	1						
2. PC	24.05(3.93)	-0.604**	1					
3. NC	12.25(2.93)	0.435**	-0.299**	1				
4. strength	19.68(3.94)	-0.526**	0.513**	-0.182**	1			
5. optimism	10.71(2.32)	-0.427**	0.434**	-0.147**	0.527**	1		
6. tenacity	33.61(5.77)	-0.520**	0.524**	-0.213**	0.658**	0.523**	1	
7. PR	64.01(10.39)	-0.584**	0.583**	-0.221**	0.864**	0.714**	0.922**	1

PR, psychological resilience; PD, psychological distress; PC, positive coping style; NC, negative coping styles. **□p□0.01.

2.3 Mediation effect analysis. We discovered that the structural equation model exhibited a good fit to the data (x^2/df=1.634□RMSEA=0.035□GFI=0.964□IFI=0.988□CFI=0.988□TLI=0.985□AGFI=0.950). The results indicated statistically significant associations among psychological resilience, coping style, and psychological distress. Results are presented in Table 3 and FIG 2. Psychological resilience demonstrated a significant negative direct influence on distress (β = −0.440, p < 0.001). In addition to, psychological resilience was a significant positive predictor of positive coping (β = 0.655, p < 0.001) and significantly and negatively predicted negative coping (β = −0.270, p < 0.001). Positive coping, in turn, was a significant negative predictor of psychological distress (β = −0.263, p < 0.01), whereas negative coping positively predicted distress (β = 0.254, p < 0.001). These findings support the rejection of the null hypotheses for both Hypotheses 1 and 2.

The findings indicated that coping styles significantly mediated the relationship between psychological resilience and psychological distress. The total indirect effect was −0.241, which accounted for 35.39% of the overall effect. The direct effect of psychological resilience on psychological distress was −0.44 (95% *CI*: −0.559, −0.325), while the total indirect effect was −0.241 (95% *CI*: −0.312, −0.162). Specifically, the indirect pathway through positive coping yielded a coefficient of −0.172 (Bootstrap 95% *CI*: −0.223, −0.116), suggesting that positive coping served as a mediator between resilience and distress, explaining 25.26% of the total effect. The path coefficient for the indirect influence of psychological resilience on distress via negative coping strategies was -0.069 (Bootstrap 95% *CI*: -0.089, -0.046), suggesting that negative coping served a notable mediating function in the correlation between psychological resilience and distress, contributing 10.13% to the overall effect.

TABLE3 Relationships among paths structural equation modeling (n=514)

Paths	Effect	95%bias-correctd *CI*	Proportion(%)
Total effect: PR→PD	-0.681	-0.741, -0.611***	100
Direct effect: PR→PD	-0.44	-0.559, -0.325***	64.61
Total indirect effect	-0.241	-0.312, -0.162***	35.39
Indirect effect 1: PR→PCS→PD	-0.172	-0.223, -0.116***	25.26
Indirect effect 2: PR→NCS→PD	-0.069	-0.089, -0.046***	10.13

PR, psychological resilience; PD, psychological distress; PCS, positive coping style; NCS, negative coping styles. CI, confidence interval. ****P* < 0.001.

Discussion

The psychological resilience score of perimenopausal nurses was (64.01±10.39), higher than previously reported values[34]. Nurses older than 40 years exhibit better mental resilience, consistent with previous findings[35]. This may be attributed to perimenopausal nurses' extensive work experience, exposure to greater pressure and adversity, optimism, enthusiasm for work and life, and a strong sense of mission. Such nurses are not only willing to accept challenges in nursing but also tend to adopt a positive cognitive approach to pressure, facilitating personal growth after stressful events[36].

Our results indicated that the psychological distress score was significantly higher than that of general perimenopausal women[37](20.44±5.78) and general nurses[4](23.72 ± 7.22). This may be attributed to the physiological propensity of perimenopausal women to easily experience anxiety, depression, insomnia, and other psychological distress symptoms due to estrogen deficiency[8, 9]. In this study, 87.35% of perimenopausal nurses held senior or higher professional titles, often serving as department managers or administrative leaders. Consequently, they face greater work intensity and complex interpersonal relationship pressures compared to ordinary nurses, leading to prolonged mental tension and a higher likelihood of psychological problems. Additionally, our investigation focused on perimenopausal nurses in tertiary hospitals with high patient flow, who are responsible for managing more urgent and critical cases compared to those in ordinary hospitals. Furthermore, the psychological distress rate among perimenopausal nurses was 92.8%, aligning with previous studies[38]. It indicates that perimenopausal nurses experience a high level of psychological distress. This study revealed that participants scored higher on positive coping styles compared to negative ones, which aligns with prior studies[23], indicating that perimenopausal nurses in our sample tended to employ positive coping strategies to manage pressure. This inclination may stem from their ability to draw on work experience, social support, and other factors to employ a positive coping effectively, thereby enhancing their adaptation to job demands.

We found that psychological resilience of perimenopausal nurses could directly affect the level of psychological distress, and the two were negatively correlated, which verified hypothesis 1.The finding consistent with previous research[39]. Psychological resilience has a protective effect on a person's mental health and happiness[40, 41]. Individuals with high psychological resilience excel in positively coping with stressful events, which reduces stress and mitigates negative emotion, thereby alleviating symptoms of psychological distress. Conversely, individuals with low resilience tend to perceive stress as threatening, leading to heightened anxiety, fear, and withdrawal behaviors, thereby increasing levels of psychological distress[17]. This finding underscores the need to focus on enhancing the psychological resilience of perimenopausal nurses and to implement targeted resilience training, thereby strengthening their capacity to adapt to stress and alleviating psychological distress.

Coping style functioned as a mediator in the relationship between psychological distress and resilience, thereby supporting Hypothesis 2. Comparable outcomes have been documented in previous studies[42]. The structural equation model in this study further revealed that both positive and negative coping styles served as mediators in the association between psychological resilience and psychological distress among perimenopausal nurses, accounting for 25.26% and 10.13% of the effect, respectively. In the face of life crisis, individuals adopt different coping styles, which will have completely different influences on an individual’s psychological well-being[43]. This study found that the positive coping style can relieve the psychological distress of perimenopausal nurses, but the negative coping style can increase the psychological distress of this group. Positive coping style reflects an individual's propensity towards maintaining a positive emotional state, which is helpful to the development of events, thereby reducing the occurrence of diseases and psychological problems.

Perimenopausal nurses with positive coping style can effectively utilize coping resources during stress, rapidly adjusting to the physical and psychological changes associated with the perimenopausal period, thereby mitigating the adverse impact of stressors on mental health. As the psychological resilience level decreases among perimenopausal nurses, they are linked to adopt negative coping styles, resulting in higher levels of psychological distress. When psychological needs are unmet, they are more likely to resort to avoidance and other negative coping styles[44]. Nurses with inadequate mental resilience and poor stress assessment tend to resort to escapism and fear difficulties, adopting negative coping strategies that fail to effectively address underlying issues, leading to the accumulation of negative emotions and compromising mental health. These findings suggest that managers ought to enhance training programs for perimenopausal nurses on coping strategies, help them accurately recognize and effectively manage stressors and challenges, and foster psychological resilience to alleviate psychological distress.

Furthermore, this study found that perimenopausal nurses who employed positive coping strategies were negatively correlated with psychological distress and positively associated with mental resilience, whereas their negative coping styles showed positive correlations with both psychological distress and mental resilience. This result is consistent with prior studies[45, 46]. Low resilience and negative coping styles can lead to post-traumatic stress and job burnout[47], thereby compromising medical service

quality and endangering mental health. Additionally, personality traits significantly influence coping styles and psychological distress[48], nurses with negative personalities are more susceptible to psychological challenges[42].

3.1 Implication for Nursing Management. The findings in our study hold substantial implications for facilitating the mental health of perimenopausal nurses and promoting healthy aging. Meanwhile, the results of our study suggest that hospital managers can improve the psychological resilience of perimenopausal nurses by carrying out positive cognitive emotion regulation intervention strategies from the perspective of positive psychology[24], encouraging them to take positive coping styles to solve problems and protecting mental health from the adverse impact of stressors.

3.2 Limitations. First, although it explored the connection among psychological strain, coping strategies, and mental resilience in perimenopausal nurses, causal inferences could not be drawn, which warrants investigation in future studies. Second, all information was acquired through self-administered questionnaires, which may have introduced reporting bias. Finally, the sample size was limited to tertiary hospital in one city, which may not generalize to other regions of China. Thus, future studies should include participants from diverse hospitals and regions to validate these findings.

Conclusion

This research explored the link between psychological resilience, coping style, and strain among perimenopausal nurses, revealing that coping strategies significantly mediated the association between resilience and strain. The results manifested that perimenopausal nurses exhibited a high incidence of psychological strain and tended to utilize positive coping strategies to handle stress. These findings highlight the importance for healthcare administrators to closely monitor the mental well-being of perimenopausal nurses and provide support in managing psychological strain.

Declarations

Author contributions

Chunfang Cheng: Conceptualization, Data curation, Writing - original draft, Writing – review & editing.

Ziqi Zhou: Conceptualization, Data curation, Formal analysis, Writing - review & editing. **Jie Yun:** Conceptualization, Data curation, Formal analysis, Writing – original draft, Writing – review & editing.

Jialin Wang: Data curation, Writing – review & editing.

All authors read and approved the manuscript.

Data Availability Statement

Research data are available from the corresponding author upon reasonable request.

Ethics Statement

Ethical approval for this research was granted by the Medical Ethics Committee of the Affiliated Hospital of Chengdu University of Traditional Chinese Medicine, Sichuan Province, China (No.2023KL-098).

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Conflicts of Interest

The authors declare no conflicts of interest.

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Figures

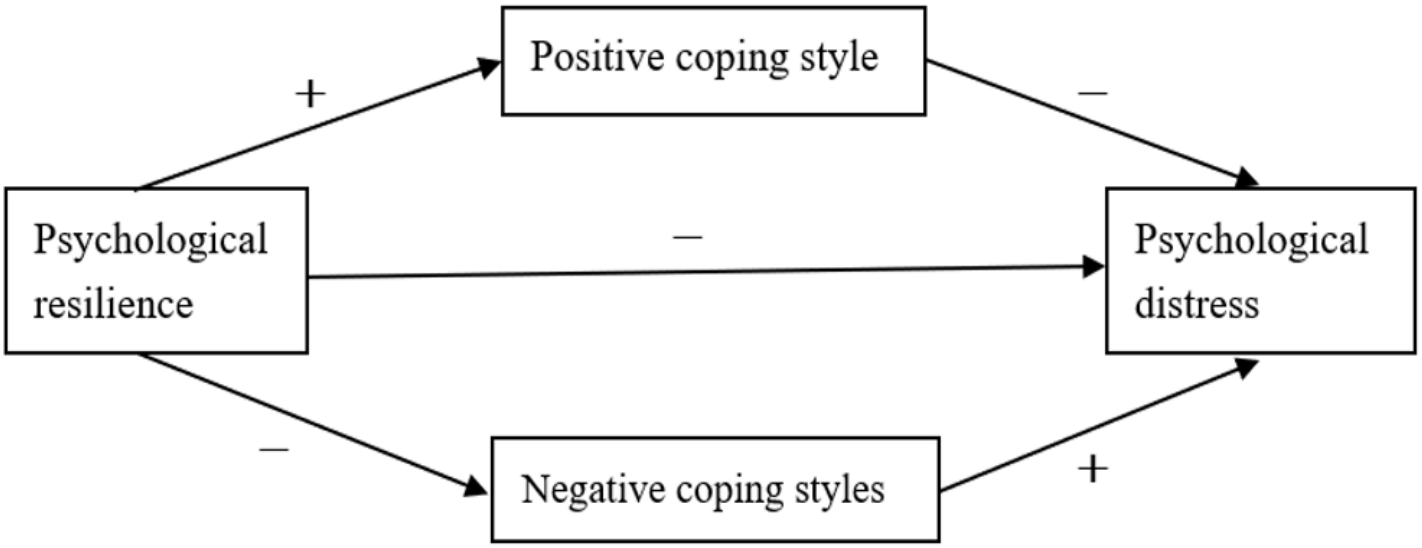


Figure 1

The conceptual framework and hypothesis.

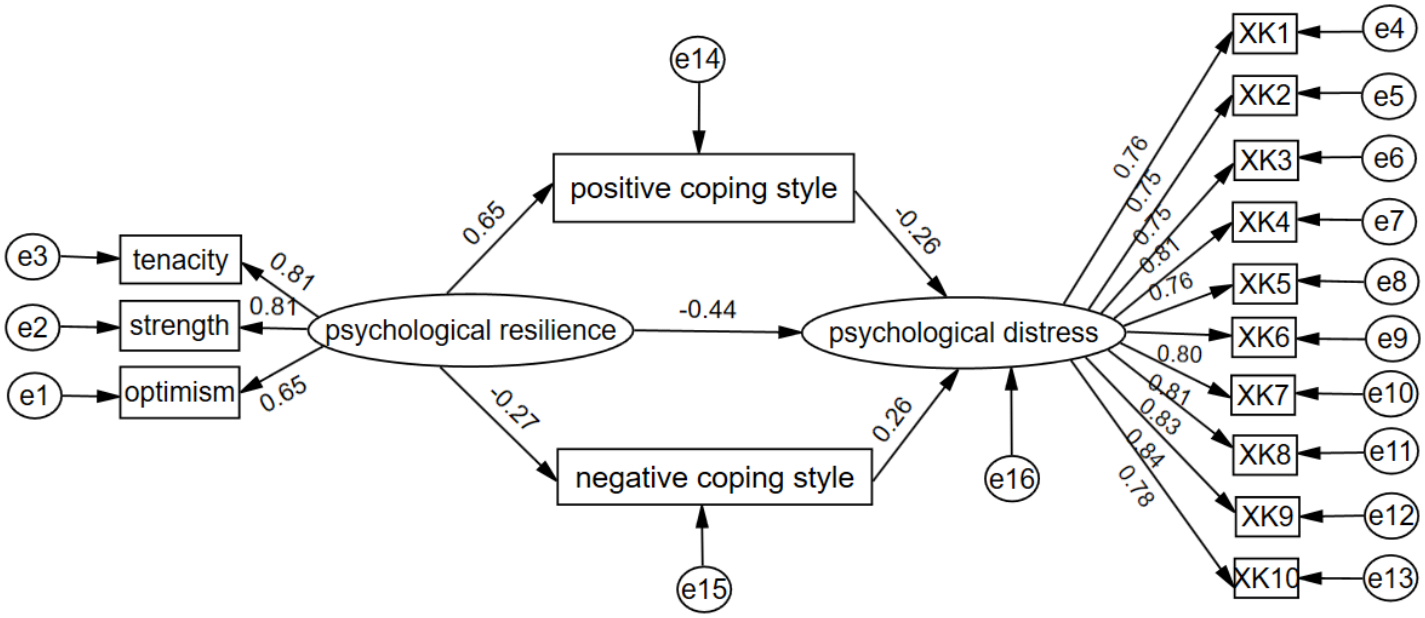


Figure 2

Structural equation modeling outcomes on psychological distress, resilience, and coping strategies