Journal of Integrative Nursing and Palliative Care (JINPC)

Original Article

Volume 6 | Issue 1 | Page 73-82

Coping and Resilience as Mediators in the Relationship Between Parenting Styles and Academic Procrastination Among Chinese Nursing Undergraduates: A Cross-Sectional Analysis

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Abstract

Academic procrastination among nursing students can undermine learning engagement, contribute to higher dropout rates, and compromise the quality of nursing education. Understanding the factors that influence procrastination is therefore essential. This study explored whether coping strategies and resilience serve as mediating factors in the link between parenting styles and academic procrastination in undergraduate nursing students. A cross-sectional survey was administered to 683 nursing undergraduates in China from March to May 2022. Participants completed questionnaires assessing parenting styles, coping strategies, resilience, and academic procrastination. Data were analyzed using descriptive statistics, Pearson correlations, and mediation analyses via Hayes' PROCESS Macro in SPSS 25.0. Positive parenting styles were associated with lower levels of academic procrastination, both directly and indirectly through three mechanisms: increased use of positive coping strategies, reduced reliance on negative coping strategies, and enhanced resilience. Negative parenting styles were linked to higher academic procrastination directly and indirectly through greater use of negative coping strategies and lower resilience. The mediating effects accounted for notable proportions of the total relationships. Interventions aiming to reduce academic procrastination in nursing students should consider not only parenting influences but also students' coping approaches and resilience levels, promoting strategies that strengthen positive coping and resilience.

Keywords: Academic procrastination, Coping strategies, Resilience, Parenting styles, Nursing students

Introduction

Procrastination is a maladaptive behavior in which individuals voluntarily delay planned tasks without a clear justification [1, 2]. Academic procrastination, a specific form of procrastination in educational settings, involves postponing study-related tasks. It is prevalent among medical students, with rates ranging from 13.8% to 49.9% [3, 4]. Research has demonstrated that academic procrastination can lead to poorer academic performance, negative learning attitudes, and adverse emotional outcomes, including anxiety, depression, and even suicidal tendencies [5–11]. For nursing students specifically, procrastination can hinder the acquisition of essential knowledge and skills, which may ultimately affect the quality of nursing education and the preparation of a competent workforce [12]. With global nursing shortages and increasing challenges in recruiting and retaining qualified nurses [13, 14], addressing academic procrastination among nursing students is essential. Understanding its underlying risk factors and mechanisms can inform strategies to foster effective learning, resilience, and professional development in nursing education worldwide.

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Received: 17 January 2025; **Accepted:** 21 March 2025; **Published:** 30 June 2025

How to Cite This Article: Hong J, Jun H, Tao Q, Wen T, Hui Y. Coping and Resilience as Mediators in the Relationship Between Parenting Styles and Academic Procrastination Among Chinese Nursing Undergraduates: A Cross-Sectional Analysis. J Integr Nurs Palliat Care. 2025;6(1):73-82. https://doi.org/10.51847/4D1QGh2ZwY

Background

Parenting styles and academic procrastination

Bronfenbrenner's ecological systems theory posits that family, as the most immediate system in an individual's life, exerts a strong influence on development [15]. Parenting style, reflecting consistent parental attitudes, beliefs, and behaviors, shapes the parent-child relationship and can impact how children approach challenges [16-18]. Empirical evidence suggests that different parenting styles are associated with varying coping strategies [19, 20]. For instance, negative or authoritarian parenting has been linked to higher levels of procrastination, while positive or supportive parenting is associated with lower procrastination [21, 22]. Milgram *et al.* reported that autocratic maternal behavior contributes to life-related procrastination, whereas autocratic paternal behavior is associated with academic procrastination [23]. Similar patterns have been observed in Chinese student populations [24]. Although the association between parenting style and procrastination has been explored in general college students, few studies have focused specifically on nursing undergraduates [25, 26]. In China, nursing undergraduates constitute a critical segment of the healthcare workforce, particularly in hospitals and community care settings, where there is a high demand for nurses with advanced education [27, 28]. Investigating how parenting styles influence academic procrastination in this population is therefore timely and important.

The potential mediating role of coping style

Coping refers to the cognitive and behavioral strategies individuals employ to manage stress, commonly categorized as positive or negative coping styles [29]. Parenting styles can shape how individuals respond to stress; for example, parental rejection often leads to defensive or hostile coping behaviors, whereas supportive parenting fosters constructive coping strategies [30–32]. Prior research shows that positive coping, such as problem-solving and seeking support, is associated with better outcomes, whereas negative coping correlates with adverse outcomes [33, 34]. These findings suggest that coping style may mediate the relationship between parenting style and academic procrastination.

The potential mediating role of resilience

Resilience is defined as an individual's capacity to adapt to changing circumstances and recover from stress [35, 36]. It serves as a key personal resource in coping with challenges [37]. Parenting style plays a critical role in the development of resilience, with supportive parenting enhancing resilience and negative parenting undermining it [38–40]. Moreover, resilience has been negatively associated with academic procrastination, indicating that students with higher resilience are less likely to delay academic tasks [41]. Thus, resilience may function as an important mediator in the pathway linking parenting styles to academic procrastination.

Aims

Drawing from prior research, we hypothesize that both coping style and resilience may function as intermediary mechanisms linking parenting style to academic procrastination in undergraduate nursing students. This study therefore examines the following propositions **(Figure 1)**:

1. **Hypothesis 1:** Parenting style exerts a direct influence on academic procrastination among nursing undergraduates.
2. **Hypothesis 2:** The relationship between parenting style and academic procrastination is partially mediated by students' coping styles.
3. **Hypothesis 3:** Students' resilience acts as a mediator in the association between parenting style and academic procrastination.

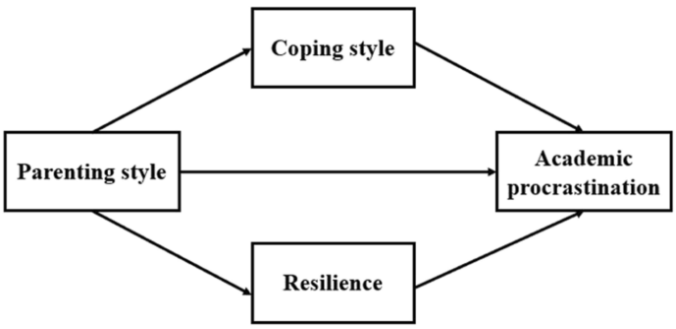

Figure 1. The proposed theoretical mediation model

Materials and Methods

Study design

This study employed a cross-sectional survey design, conducted between March and May 2022.

Participants

Participants were recruited through convenience sampling from two undergraduate nursing programs in Henan Province, China. Inclusion criteria required participants to be: (1) full-time nursing undergraduates in Years 1–3, and (2) willing to participate with a clear understanding of the study purpose. Students who did not complete the entire questionnaire for any reason were excluded from the study. Equation $N = 4U\alpha^2S2/\delta^2$ was used to calculate the sample size [42]. $S = 0.51$ is calculated from the presurvey, the allowable error δ is set to 0.1, and α is set to 0.05, so $N = 4 \times 1.96^2 \times 0.51^2/0.1^2 \approx 400$.

Sample size and data collection

To account for potential sampling error and incomplete questionnaires, a total of 687 questionnaires were distributed. After removing four incomplete responses, 683 valid questionnaires were included in the final analysis. According to Bentler and Chou [43], the sample size should exceed ten times the number of observed variables, indicating that our sample was sufficient for testing the hypothesized models.

Prior to data collection, the study procedures and questionnaire content were discussed with the psychological services departments of the participating universities. Paper questionnaires were administered in classroom settings, with approximately 50 students per session, and required 15–20 minutes to complete. No incentives were provided. Participants were assured that responses would remain anonymous and confidential, and that the data would be used solely for research purposes. Ethical approval was obtained from the Institutional Review Board of Henan Provincial Key Laboratory of Psychology and Behaviour (Reference: 20220107001), and all procedures adhered to the Declaration of Helsinki.

Instruments

Demographic questionnaire

Participants provided basic demographic information, including age, gender, and home location.

Chinese version of the parenting bonding instrument (PBI)

The PBI, developed by Parker [44] and adapted for Chinese populations by Yang [45], contains 46 items split into Mother (PBI-M) and Father (PBI-F) versions, each with 23 items. The scale assesses three dimensions: care, control, and encouragement of autonomy. Care and encouragement of autonomy were classified as positive parenting, while control was considered negative parenting. Items are rated on a 4-point Likert scale (1 = very inconsistent, 4 = very consistent). In this study, Cronbach's α was 0.873 overall, 0.940 for positive parenting, and 0.842 for negative parenting.

Short coping style scale (SCSS)

Developed by Xie [46], the SCSS measures positive and negative coping strategies with 20 items. Positive coping (12 items) captures strategies such as "trying to see the good side of things," while negative coping (8 items) reflects behaviors like "hoping a miracle will change the situation." Responses are rated on a 4-point Likert scale (1 = not at all, 4 = often). In this sample, Cronbach's α values were 0.805 for positive coping, 0.742 for negative coping, and 0.812 overall.

Connor-davidson resilience scale (CD-RISC, Chinese Version)

The CD-RISC, developed by Connor and Davidson [47] and adapted to Chinese populations by Yu [48], contains 25 items across three dimensions: tenacity, strength, and optimism. Each item is rated on a 5-point Likert scale (0 = never, 4 = almost always). Previous studies in China reported high reliability (Cronbach's α = 0.91), which was confirmed in this study (α = 0.91).

Aitken procrastination inventory (API)

The API, developed by Aitken [49], evaluates long-term academic procrastination in college students. It consists of 19 items, with responses on a 5-point Likert scale (1 = completely inconsistent, 5 = completely consistent). Certain items (2, 4, 7, 11, 12, 14, 16, 17, 18) are reverse-scored. Sample items include "I always start things at the last minute." Higher scores indicate greater academic procrastination. In this study, Cronbach's α was 0.818.

Statistical analyses

All analyses were conducted using IBM SPSS Statistics 25.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize participants' demographic characteristics, with continuous variables presented

as means and standard deviations, and categorical variables reported as frequencies and percentages. The Kolmogorov–Smirnov test was applied to assess the normality of continuous data.

Pearson correlation coefficients were calculated to examine the relationships among parenting style, coping style, resilience, and academic procrastination. Harman's single-factor test was performed to assess potential common method bias arising from self-reported measures [50]. Mediation analyses were conducted using PROCESS version 4.1 (Model 4) developed by Hayes [51], with bootstrapping (5,000 resamples) to estimate 95% confidence intervals (CIs) for indirect effects. Covariates in the models included gender, age, home location, academic year, and family structure. Effects were considered statistically significant if the 95% CI did not include zero.

This study adhered to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines [52] to ensure transparent and rigorous reporting.

Validity, reliability, and rigour

All instruments employed in this study had previously been adapted and validated for Chinese populations, demonstrating satisfactory reliability and validity. Prior to data collection, all investigators received training on participant registration, ensuring completeness of questionnaires, and adhering to ethical research standards. To minimize potential self-report bias, participants' identities were kept strictly confidential. Additionally, to enhance the rigor and accuracy of the statistical analyses, a statistics professor reviewed and verified the data processing procedures.

Results and Discussion

Common method bias

Harman's single-factor test was conducted to assess common method variance. A total of 29 factors with eigenvalues greater than 1 were extracted, with the first factor accounting for 15.06% of the total variance—well below the recommended 40% threshold [53]. These results indicate that common method bias is unlikely to have significantly influenced the study findings.

Participant characteristics

A total of 683 nursing undergraduates completed the survey. Among them, 152 (22.3%) were male and 531 (77.7%) were female. Participants' ages ranged from 17 to 24 years, with a mean of 19.84 years (SD = 1.19). Regarding residential background, 36.7% were from towns and 63.3% from villages. Year of study was distributed as follows: 42.8% freshmen, 34.1% sophomores, and 22.8% juniors. Only children represented 14.1% of the sample, while the majority (85.9%) came from families with multiple children **(Table 1)**.

Table 1. Demographic characteristics of undergraduate nursing students. ($N = 683$)

Variable	N = 683	%
Gender, n (%)		
Male	152	22.3
Female	531	77.7
Age, M (SD)	19.84 (1.19)	—
Grade		
Grade 1	294	43.1
Grade 2	233	34.1
Grade 3	156	22.8
Home Location		
Town	251	36.7
Village	432	63.3
Only child in family		
Yes	96	14.1
No	587	85.9

Descriptive statistics and variable relationships

Descriptive statistics, including means and standard deviations, alongside Pearson correlation coefficients for all variables, are summarized in **Table 2**. Results indicated that higher levels of positive parenting were linked to greater use of positive coping strategies ($r = 0.203$, $p < 0.01$) and higher resilience ($r = 0.264$, $p < 0.01$), while being associated with lower negative coping ($r = -0.155$, $p < 0.01$) and reduced academic procrastination ($r = -0.289$, $p < 0.01$). In contrast, negative parenting showed a positive relationship with negative coping ($r = 0.213$, $p < 0.01$) and academic procrastination ($r = 0.243$, $p < 0.01$), and a small negative association with resilience ($r = -0.078$, $p < 0.01$). Resilience itself was inversely correlated with academic procrastination ($r = -0.293$, $p < 0.01$). Moreover, students who engaged more frequently in positive coping exhibited lower procrastination ($r = -0.260$,

$p < 0.01$), whereas higher reliance on negative coping corresponded with greater academic procrastination ($r = 0.283$, $p < 0.01$).

Table 2. Means, standard deviations, and correlations of the study variables ($N = 683$)

Variables	Mean ± SD	1	2	3	4	5	6	7	8	9	10	11
PSC	2.16 ± 0.51	1										
PSCL	0.78 ± 0.48	-.320**	1	c								
PSEA	2.19 ± 0.50	.524**	-.456**	1								
PPS	2.18 ± 0.45	.941**	-.416**	.781**	1							
PCS	3.02 ± 0.43	.189**	-0.065	.161**	.203**	1						
NCS	2.38 ± 0.55	-.160**	.213**	-.096*	-.155**	0.044	1					
Tenacity	3.37 ± 0.55	.223**	-0.053	.179**	.234**	.525**	-0.06	1				
Strength	3.60 ± 0.53	.251**	-.131**	.215**	.270**	.550**	-.093*	.755**	1			
Optimization	3.37 ± 0.56	.182**	-0.009	.123**	.182**	.438**	0.068	.564**	.621**	1		
Resilience	3.45 ± 0.49	.250**	-.078*	.202**	.264**	.577**	-0.055	.949**	.901**	.727**	1	
AP	2.55 ± 0.50	-.274**	.243**	-.223**	-.289**	-.260**	.283**	-.265**	-.317**	-.154**	-.293**	1

Abbreviations: PSC Parenting style-care, *PSCL* Parenting style-control, *PSEA* Parenting style- encourage autonomy, *PPS* Positive parenting style, *PCS* Positive coping style, *NCS* Negative coping style, *AP* Academic procrastination; $P < 0.05$, ** $P < 0.01$

Mediation analysis of positive parenting style on academic procrastination

The analysis **(Figure 2)** indicated that students who experienced higher levels of positive parenting reported lower academic procrastination ($B = -0.323$, $p < 0.001$). Introducing the potential mediators—positive coping, negative coping, and resilience—revealed that the negative association between positive parenting and procrastination remained significant, suggesting that these factors partially mediate the relationship (positive coping: $B = -0.276$, $p < 0.001$; negative coping: $B = -0.250$, $p < 0.001$; resilience: $B = -0.279$, $p < 0.001$).

Further examination of the pathways showed that positive parenting predicted greater use of adaptive coping strategies ($B = 0.197$, $p < 0.001$), which were associated with lower procrastination ($B = -0.241$, $p < 0.001$). At the same time, positive parenting was linked to reduced reliance on maladaptive coping ($B = -0.194$, $p < 0.001$), and higher negative coping scores were related to increased procrastination ($B = 0.227$, $p < 0.001$). Additionally, positive parenting was positively associated with resilience ($B = 0.284$, $p < 0.001$), which in turn was negatively related to procrastination ($B = -0.259$, $p < 0.001$).

Overall, these results suggest that the influence of positive parenting on academic procrastination operates both directly and indirectly, with positive coping, negative coping, and resilience serving as partial mediators. The proportions of direct and indirect effects are detailed in **Table 3**.

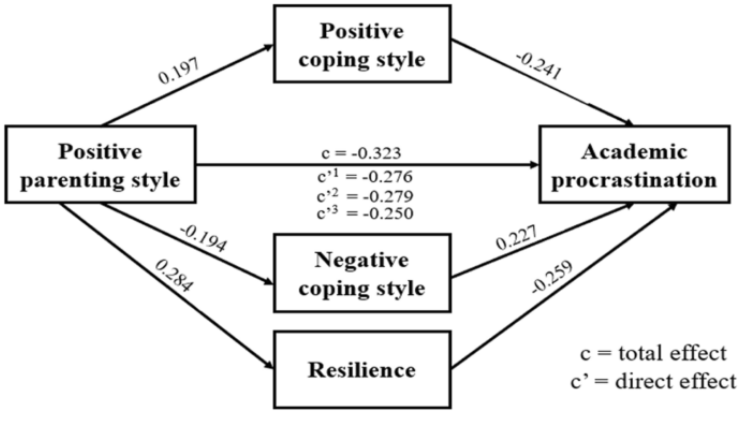

Figure 2. The mediating effect of coping style and resilience between positive parenting style and academic procrastination

Table 3. Total, direct and indirect effects of Parenting Style on academic procrastination

Path	Effect Type	Effect	Boot SE	Boot LLCI	Boot ULCI	Relative Mediation Effect
PPS → PCS → AP	Direct	-0.276	0.043	-0.358	-0.190	85.39%
	Indirect	-0.048	0.013	-0.074	-0.025	14.71%
	Total	-0.323	0.041	-0.404	-0.242	—

PPS → NCS → AP	Direct	-0.279	0.042	-0.360	-0.195	86.36%
	Indirect	-0.044	0.013	-0.071	-0.021	13.64%
	Total	-0.323	0.041	-0.404	-0.242	—
PPS → Resilience → AP	Direct	-0.250	0.043	-0.331	-0.166	77.28%
	Indirect	-0.074	0.016	-0.107	-0.044	22.82%
	Total	-0.323	0.041	-0.404	-0.242	—
NPS → NCS → AP	Direct	0.201	0.039	0.124	0.276	78.23%
	Indirect	0.056	0.014	0.032	0.086	21.73%
	Total	0.257	0.040	0.179	0.335	—
NPS → Resilience → AP	Direct	0.229	0.039	0.154	0.304	89.07%
	Indirect	0.028	0.013	0.004	0.055	10.93%
	Total	0.257	0.040	0.179	0.335	—

Abbreviations: PPS Positive parenting style, *PCS* Positive coping style, *AP* Academic procrastination, *NCS*, Negative coping style, *NPS* Negative parenting style, *Boot LLCI* the lower limit confidence interval of effects estimated by Bootstrap Method, *Boot SE* the standard error of effects estimated by Bootstrap method, *Boot ULCI* the upper limit confidence interval of effects estimated by Bootstrap method

Mediation analysis of negative parenting style on academic procrastination

As depicted in **Figure 3**, negative parenting style was positively associated with academic procrastination (B = 0.257, p < 0.001). When the mediators—negative coping and resilience—were included separately in the model, the relationship between negative parenting and procrastination remained statistically significant (negative coping: B = 0.201, p < 0.001; resilience: B = 0.229, p < 0.001), indicating partial mediation.

Further examination revealed that negative parenting was linked to greater reliance on maladaptive coping strategies (B = 0.247, p < 0.001), which were in turn positively associated with academic procrastination (B = 0.226, p < 0.001). In contrast, negative parenting was associated with lower levels of resilience (B = −0.094, p < 0.001), and higher resilience was related to reduced procrastination (B = −0.299, p < 0.001).

These findings suggest that the influence of negative parenting on academic procrastination occurs both directly and indirectly, with negative coping and resilience acting as partial mediators. Table 3 provides the proportion of direct and indirect effects relative to the total effect.

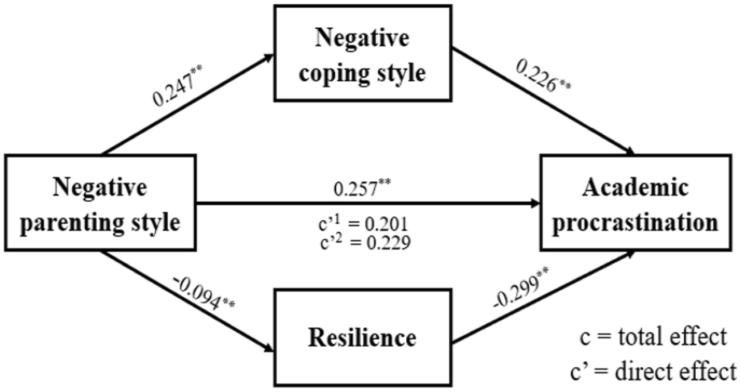

Figure 3. The mediating effect of negative coping style and resilience between negative parenting style and academic procrastination

This study investigated how coping style and resilience mediate the relationship between parenting style and academic procrastination in nursing undergraduates. Specifically, we examined the associations among parenting style, coping mechanisms, resilience, and academic procrastination, as well as the pathways through which these variables influence one another.

Firstly, our findings indicate that positive and negative parenting styles are significant predictors of academic procrastination in opposite directions: positive parenting is associated with lower procrastination, whereas negative parenting predicts higher procrastination, supporting Hypothesis 1. This aligns with prior research [24, 54]. As a key component of the family microsystem, parenting style exerts a profound influence on individual personality, behavior, and attitudes [55, 56]. Academic procrastination, as a behavioral tendency, is shaped in part by the family environment. Students raised in supportive and nurturing families are more likely to receive encouragement and understanding, which fosters constructive approaches to learning challenges and results in lower procrastination. In contrast, students exposed to consistent rejection or punitive parenting may experience frustration and helplessness, leading to negative attitudes toward academic tasks and higher levels of procrastination [54].

Secondly, our results reveal that positive parenting not only directly reduces academic procrastination but also exerts indirect effects via positive and negative coping styles. Conversely, negative parenting increases procrastination both directly and indirectly through negative coping. These findings support Hypothesis 2.

Positive parenting appears to facilitate the development of adaptive coping strategies, reinforcing students' beliefs in their own effort and ability as determinants of academic success. On the other hand, negative parenting tends to promote maladaptive coping, fostering perceptions that academic outcomes are controlled by luck or external circumstances, which discourages active engagement in learning [57]. This highlights the critical role of the family environment in shaping coping strategies, a key determinant of adolescents' physical and mental development [19]. Prior studies have similarly demonstrated that coping style mediates the influence of parenting on various behavioral outcomes [57, 58]. In the present study, coping style emerged as a significant pathway linking parenting style to academic procrastination, emphasizing its dual role as both a product of parental influence and a predictor of student behavior.

Thirdly, resilience was also identified as a partial mediator in the relationship between parenting style and academic procrastination, supporting Hypothesis 3. Specifically, positive parenting was associated with higher resilience, which in turn was linked to lower procrastination, while negative parenting reduced resilience, thereby contributing to higher procrastination. Resilience represents a key personal resource for managing stress and adapting to challenges [59]. In the context of nursing education, students frequently encounter academic and clinical difficulties. High-resilience individuals are better able to cope with stress, adjust their learning strategies flexibly, and remain engaged in their studies. Conversely, students with lower resilience struggle to manage pressure and often fail to regulate their learning behaviors, leading to higher procrastination [60]. Resilience enhances self-esteem, self-efficacy, and psychological endurance, enabling students to resist short-term temptations and devote more cognitive resources to academic tasks, thereby reducing procrastination [61]. As highlighted by Cleary [62], resilience is essential for nursing students to succeed in both learning and clinical practice. These findings underscore the potential of resilience-focused interventions, such as individual or group counseling, to strengthen students' capacity to cope with stress and mitigate academic procrastination.

Implications for nursing education

The findings of this study have both theoretical and practical significance for addressing academic procrastination among nursing undergraduates. Several recommendations can be drawn. First, parents should adopt positive and democratic parenting approaches, offering affirmation, encouragement, and praise while minimizing criticism, rejection, or punitive behaviors. Such supportive parenting can foster students' motivation and engagement in their studies, reducing procrastination.

Second, nursing educators should create a supportive learning environment that promotes student participation in classes and extracurricular activities. Interventions such as individual or group counseling can help students cultivate resilience and adaptive coping strategies, empowering them to manage academic and personal challenges effectively.

Third, nursing students themselves can benefit from developing structured study habits, improving time management skills, and incorporating relaxation techniques—such as exercise or music—to alleviate stress and mitigate procrastination. Finally, educational institutions can involve psychological professionals to provide training aimed at enhancing resilience and positive coping skills, thereby improving academic efficiency and reducing procrastination behaviors.

Limitations

Despite the significance of these findings, several limitations should be acknowledged. First, the cross-sectional design limits causal inferences, highlighting the need for longitudinal studies to explore the temporal relationships among parenting style, coping, resilience, and academic procrastination. Second, all data were self-reported, which may introduce recall or reporting biases. Although common method bias was not detected, future research could employ multiple data sources, such as peer or instructor reports, to enhance reliability. Finally, the sample was drawn from only two universities, limiting the generalizability of the findings. Future studies should include more diverse populations across different cultural and educational contexts to validate and extend these results.

Conclusion

Amid a global nursing shortage, strategies to reduce student attrition and enhance the quality of nursing education are urgently needed. This study demonstrated that coping style and resilience not only directly influence academic procrastination among nursing students but also partially mediate the relationship between parenting style and procrastination. These findings underscore the importance of interventions that foster positive coping strategies and resilience in nursing undergraduates, offering a foundation for the development of targeted programs to mitigate academic procrastination and improve overall educational outcomes.

Acknowledgments: None

Conflict of interest: None

Financial support: None

Ethics statement: None

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