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Personality preferences and stress perception among nursing students in different nursing programmes: a cross-sectional study

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Abstract

Background Understanding personality preferences is crucial for guiding healthcare education and the stress management strategies of nursing students. While stress in nursing education has been well studied, its relationship with personality preferences, particularly in clinical settings, has been underexplored. This study aims to investigate the relationship between personality preferences and stress perception among nursing students in three different nursing programmes.

Methods This cross-sectional study recruited 780 nursing students. We used structured questionnaires to collect data on demographics, personality preferences, and stress perception. The Myers–Briggs Type Indicator (MBTI) was used to measure personality preferences across four dimensions: extraversion/introversion, sensing/intuition, thinking/feeling, and judging/perceiving. The Chinese version of the MBTI and the Nurse Stress Checklist were also employed. Statistical analyses included descriptive statistics, one-way analysis of variance, and independent t-tests.

Results Three common personality preferences were identified: extraversion, intuition, feeling, and perceiving; introversion, sensing, thinking, and judging; and introversion, sensing, feeling, and judging. The findings indicate that stress was significantly related to personality preferences. There were significant differences in the stress scores and the extraversion/introversion and thinking/feeling subscales. However, no significant differences in stress levels were observed across different nursing programmes.

Conclusions Each personality trait exhibited specific stress coping mechanisms. Addressing students' stress is crucial because it can lead to academic burnout and attrition. This study's findings can inform strategies to reduce stress while accommodating students' personality traits, ultimately enhancing student success in nursing programmes.

Keywords Personality preference, Stress perception, Nursing education, Nursing students

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Background

Stress among nursing students is a critical concern due to its significant impact on their well-being and academic performance. Nursing students face higher stress levels compared to other student populations because they must balance the demands of classroom instruction and unpredictable clinical situations. Factors such as academic work overload, fear of causing medical errors, and academic and clinical staff performance expectations contribute to this stress burden [1–3]. While stress in nursing education has been widely studied, limited research has examined how personality preferences influence stress perception and coping mechanisms, particularly in different nursing programs. Understanding the relationship between personality traits and stress is crucial for developing effective stress management strategies, which can improve nursing competencies and retain the workforce in the field of nursing.

Research indicates that psychological well-being positively affects job performance by enhancing employee engagement [4]. Personality traits, being stable and predictable characteristics, can influence a student's approach to classroom and clinical instruction, their ability to retain knowledge, and their overall stress levels [5]. Since personality preferences determine how individuals process information and manage stress, identifying these traits among nursing students may provide valuable insights into targeted interventions that promote resilience and academic success. Therefore, exploring how different personality types affect stress perception and management among nursing students can lead to tailored interventions that improve their well-being and academic outcomes.

In Taiwan, nursing education is divided into two major pathways: university/college and technical/vocational programs. University/college programs grant a baccalaureate of science degree in nursing, while technical/vocational programs offer a five-year associate degree in nursing. Nursing students are required to complete 1,016 h of clinical placement in approved teaching hospitals to register as nurses in Taiwan. These placements help students gain practical experience, develop a sense of belonging to the nursing profession, and improve their socialization skills and professional role confidence [6]. However, variations in program structure may result in differing stress levels among students, particularly in relation to their personality preferences and coping mechanisms. Examining these differences could offer insights into how nursing curricula can be adapted to better support students with varying personality profiles.

Stress is defined as the interaction between a stimulus and a response that affects an individual's physiological, psychological, and spiritual aspects [7]. Nursing students' stressors include academic workload, clinical rotations, and relationships with staff nurses [8, 9]. These stressors are common across various countries, such as the United States, Australia, and Spain [10–12]. The awareness of stress effects can reduce nurse attrition and promote patient care quality [11]. Therefore, equipping students with essential stress-coping skills is integral to their education to prevent burnout and early job attrition [13, 14]. However, the effectiveness of stress management strategies may vary depending on students' personality preferences, further emphasizing the need to investigate this relationship.

Cultural values also play a role in shaping personality preferences. For instance, an extrovert/sensing preference is common in the United States, while the model type for Chinese individuals is introvert/sensing/thinking/judging (ISTJ) [15, 16]. Gender differences impact preference combinations, with females showing a greater tendency toward feeling preferences [17]. Personal characteristics, such as personality preferences, significantly influence how individuals perceive and manage stressful situations [18]. Distress, a negative appraisal of a situation, decreases well-being and is moderated by individual physiological characteristics, which account for differences in resilience [19, 20]. However, personality preferences are also correlated with stress levels [21]. Research suggests that introverted students experience higher academic stress than their extroverted counterparts; however, few studies have specifically examined this association in nursing education. A study in the United Kingdom found that medical students with introverted personalities reported greater stress and lower career satisfaction than those with extroverted traits [22]. These findings suggest that incorporating personality-based interventions into nursing education could improve students' ability to manage academic and clinical stress effectively.

Identifying students' personality preferences can improve teaching strategies tailored to individual learning styles, resulting in better academic performance [23]. Considering individual differences in how students interpret and respond to stress is essential for understanding the relationship between personality and stress. While some studies have explored how different personality preferences affect stress coping in nurses and students [24, 25], a research gap remains in understanding how these preferences influence stress perception among nursing students enrolled in different nursing programs. To address this gap, this study aims to examine the relationship between personality preferences and stress perception among nursing students across three distinct nursing programs in Taiwan.

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Methods

Design and participants

This descriptive and exploratory study aimed to examine personality preferences among nursing students enrolled in different programs, utilizing the Chinese translation of the MBTI-M instrument [26], and to investigate whether these preferences predict perceived stress levels assessed by the self-report NSC [27]. The study employed random cluster sampling to select participants from three distinct nursing programs located in northern Taiwan. A total of 780 nursing students participated in the study, comprising 395 from a two-year baccalaureate program, 184 from a four-year baccalaureate program, and 201 from a five-year associate degree program.

Data collection

Participants were selected using random cluster sampling from classes consisting of approximately 50 students at each grade level within the three nursing programs. Data collection took place in classrooms at times convenient for the participants. Before distributing the questionnaires, the researchers provided a clear explanation of the study's objectives and procedures to the students. Each participant received a coded packet containing a demographic survey along with the two self-report instruments (MBTI-M and NSC). Upon completing the questionnaires, students sealed the packets and deposited them in a designated box in the research assistant's office for later collection and analysis.

Ethical consideration

This study received ethical approval from the university's institutional review board (Ethical Approval Code: 202002514B0). Prior to the commencement of data collection, a researcher thoroughly explained the study's design, objectives, and potential risks and benefits to the nursing students. Verbal informed consent was obtained from all participants, emphasizing the voluntary nature of their participation, the confidentiality of their data, the anonymity of research data, and their right to decline participation or withdraw from the study at any stage without facing any negative consequences.

Instrumentation

The Myers-Briggs Type Indicator, Form M (MBTI-M), developed by Myers et al., is a widely-used forced-choice psychometric tool designed to evaluate individual personality preferences [28]. It categorizes personality along four primary dimensions: extraversion/introversion (E/I), sensing/intuition (S/N), thinking/feeling (T/F), and judging/perception (J/P). These dimensions combine to generate 16 distinctive personality types. The Chinese version of the MBTI-M, which was employed in this study, has been validated as reliable and robust, with Cronbach's α coefficients ranging from 0.91 to 0.92 [29].

The dimension of extraversion/introversion (E/I) is how an individual selects to experience the world. An extrovert is attracted to the external world of people and things and appears more interactive, whereas an introvert is attracted to the internal world of thoughts and ideas and feels a need for solitude to think things through after dealing with the external world [28].

The sensing/intuition (S/N) dimension indicates an individual's preference for perceiving the world. An individual whose preference is for sensing takes a practical approach to the world based on sensory input. An intuitive individual perceives the world based on responses to personal interactions, rapport and experiences that provide opportunities [28].

The thinking/feeling (T/F) dimension preference affects an individual's decisions about the world. A person, whose preference is thinking, approaches their environment based upon logic and causal thinking, which contrasts with a feeling-type person who prefers to rely on value judgments in decision-making. A thinker is more likely to err in favour of truth and fairness, whereas a person more attuned to feelings may more likely value interpersonal harmony [28].

The judging/perception (J/P) dimension is used to assess what is most important about the world. A judging individual identifies what is most important at a particular point in time and then arranges their agenda to meet their goals; however, they are more rigid about staying on schedule. An individual who prefers perception is more receptive to adapting their schedule when the need arises, which allows them to be more flexible, impulsive and receptive to change [28].

The original MBTI-M was translated for use in multiple countries, including China [26]. The Chinese version was demonstrated as a reliable, valid [29], and accurate instrument for Chinese students, with strong content, criterion, and construct validity [30]. Cronbach's α, a common statistic for demonstrating the appropriateness of the tests and scales that researchers construct or adapt for their intended research purposes, was 0.91 or 0.92 for the Chinese version [26]. The MBTI-M has been used in previous studies to effectively assess students' personality preferences [31]. Additionally, information on the Myers and Briggs Foundation website illustrates many pioneering MBTI studies conducted with high school and college students. These initial studies, as well as ongoing data collected by colleges and universities in the United States, indicate that personality type affects student learning [32].

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The Chinese version of the Nurse Stress Checklist (NSC), developed by Taiwanese researchers Tsai and Chen [27] was completed by participants to assess stress levels. The NSC comprises 47 items measured on a 4-point Likert scale (0 = never, 1 = sometimes, 2 = often, and 3 = always), with higher scores indicating higher stress levels (score range = 0–141). The NSC questionnaire encompasses four domains: personal interactions (18 items), work concerns (13 items), competency (11 items), and domestic concerns (5 items) [27]. The questionnaire covers nurses' interactions with their environment, professional competency, and psychosocial responses to dilemmas they have encountered. The Cronbach's alpha values for the NSC for personal response, job concerns, competency, and internal concern categories were 0.94, 0.91, 0.86, and 0.84, respectively [27]. The NSC has demonstrated good internal consistency and reliability for each domain (Cronbach's alpha ≥ 0.84) and an overall internal consistency of 0.93 [27]. Previous research has confirmed the reliability and validity of the 47-item Chinese version of the NSC [33], which was thus adopted in this study.

Data analysis

The completed questionnaires were meticulously scored using the MBTI-M and NSC instruments. Descriptive statistics, such as frequencies, percentages, ranges, means, standard deviations (SD), and modes, were computed using the Statistical Package for the Social Sciences version 22.0 (SPSS 22.0). The relationships between personality preferences and perceived stress levels were examined using a combination of statistical methods. Specifically, a one-way analysis of variance (ANOVA) was employed to compare means across more than two groups, while an independent two-tailed Student's t-test was utilized for comparisons between two groups. The significance level for all statistical tests was set at $p < 0.05$.

Results

A total of 780 questionnaire packets were collected. However, data from 12 participants were excluded due to incomplete MBTI-M or NSC questionnaires. Of the 768 participants analyzed, 759 were female (97.3%), reflecting the higher enrollment of female students in nursing education programs [34]. The mean age of participants was 20.9 years (SD: 3.5; range: 17–46 years). Table 1 provides an overview of the participants' demographic information.

Personality preferences

The MBTI-M revealed that the three most frequent personality combinations among the nursing students were ENFP ($n = 94$; 11.9%), NSTJ ($n = 76$; 9.6%), and ISFJ

Table 1 Participants' demographic profiles

Characteristic	*n*	%
Gender		
Female	759	97.3
Male	21	2.7
Marital status		
Single	754	96.7
Married	25	3.2
Divorced	1	.1
Nursing work experience (years)		
None	576	73.8
< 1	114	14.6
1–5	55	7.1
> 5	35	4.5
Missing	12	

$N = 780$. Missing data included 12 participants who did not finish the questionnaires completely

($n = 70$; 8.8%). The most prevalent pairs of indicators were N/F ($n = 266$; 34.1%), E/N ($n = 255$; 32.7%), and S/J ($n = 250$; 32.1%), while the least frequent were S/P ($n = 91$; 11.7%), T/P ($n = 121$; 15.5%), and E/S ($n = 139$; 17.8%).

Stress and personality preferences

Nursing students with the INFP personality preference had significantly higher mean NSC scores (68.57 [SD = 19.05]) compared to those with other personality preferences ($p < 0.01$). The overall average NSC score among the nursing students was 58.46 (range = 0–141). NSC scores did not significantly differ among the three programs ($p > 0.05$). The mean NSC scores were 58.50 (SD = 18.00) for the five-year program, 57.19 (SD = 18.14) for the four-year program, 61.14 (SD = 19.92) for the day-time two-year program, and 57.32 (SD = 18.94) for the evening two-year program. Table 2 presents the distribution of NSC scores among different MBTI personality preferences.

We examined whether NSC scores differed between pairs of personality preferences on the MBTI-M for nursing students. Scores did not differ between S/N and J/P. However, one-way analysis of variance demonstrated that NSC scores were significantly associated with extrovert/introvert and thinking/feeling subscale scores, which were significantly higher for students who were identified as I compared with E ($p < 0.001$) and F compared with T ($p < 0.01$). Table 3 presents an overview of the MBTI-M personality dichotomies and the NSC scores, along with the 95% confidence interval for the mean, across different nursing programmess.

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Table 2 Personality preferences for MBTI-M and NSC scores among participants (*N* = 780)[a]

MBTI personality preferences	n	Scores on the NSC			
		Mean[b]	SD	Min	Max
ENFJ	69	56.12	18.34	12	100
ENFP	94	57.49	19.69	13	108
ENTJ	48	53.67	16.56	16	99
ENTP	44	52.39	18.18	23	86
ESFJ	42	57.48	18.15	25	98
ESFP	21	57.67	18.95	35	94
ESTJ	62	51.05	19.89	17	98
ESTP	14	54.93	24.00	26	98
INFJ	56	60.95	18.39	23	97
INFP	47	**68.57**	19.05	35	115
INTJ	39	56.08	17.42	20	88
INTP	42	61.31	18.49	20	102
ISFJ	70	61.79	16.97	21	101
ISFP	35	62.49	18.69	28	108
ISTJ	76	61.82	16.89	23	100
ISTP	21	60.86	19.21	22	98
Total	780	58.46	18.77	12	115

Abbreviations: *MBTI-M* Myers–Briggs Type Indicator (Form M), *NSC* Nurse Stress Checklist, *SD* Standard deviation, *E* Extroversion, *F* Feeling, *I* Introversion, *J* Judging, *N* Intuition, *P* perceiving, *S* Sensing, *T* Thinking

[a] Data missing for 12 participants with incomplete MBTI-M questionnaires

[b] Bold text indicates the highest score

Discussion

Our study predominantly comprised female nursing students, reflecting the gender distribution of the global nursing workforce, including that of Taiwan [34]. The prevalent personality preferences identified among our participants were ENFP, ISTJ, and ISFJ, aligning with previous research indicating that nursing students often exhibit sensing and judging personality traits [35]. These preferences suggest that nursing students typically approach problem-solving methodically, utilizing organizational skills to structure their study routines, and rely on empirical evidence and logic to reinforce their learning processes [26].

Our findings revealed a significant association between personality preferences and NSC scores, suggesting a correlation between specific personality traits and stress levels among nursing students. In particular, students with introversion/extroversion (I/E) and thinking/feeling (T/F) preferences demonstrated higher NSC scores. This finding is consistent with research by Ozer and Reise, which suggests that individual personality traits can predict responses to stressful situations [36]. However, due to the limited representation of male nursing students in this study, further research is necessary to determine whether these relationships are consistent across genders. Prior studies suggest that male nursing students encounter unique stressors related to their minority status in the field, including societal perceptions, gender stereotypes, and limited peer support. Addressing these challenges through gender-sensitive interventions is crucial for fostering an inclusive and supportive learning environment. A growing body of research indicates that male nursing students often report feelings of isolation in predominantly female academic settings, which can heighten stress levels and contribute to reduced retention rates [37]. To mitigate these concerns, nursing programs should implement structured mentorship initiatives that pair male students with experienced male faculty members or senior male nursing students. These programs can offer role modeling and peer support, enhancing students' sense of belonging. Additionally, fostering inclusive classroom discussions that address and challenge gender biases in nursing may create a more supportive educational climate. In clinical placements, assigning male students to diverse preceptors could provide them with exposure to professional role models of different genders, thereby broadening their career perspectives and reinforcing their professional identity.

A longitudinal study conducted among nursing students in Sweden, with a one-year post-graduation follow-up, highlighted a significant increase in burnout attributed to academic stress. This was strongly linked to diminished occupational mastery, reduced research utilization in clinical settings, and heightened intentions of leaving the profession [38]. These findings underscore the critical implications of stress on nursing practice, suggesting that highly stressed nurses may experience diminished effectiveness in their roles and encounter challenges in career advancement. Given these risks, targeted stress management interventions during nursing education are essential to improve student well-being and ensure long-term workforce sustainability [39].

Efforts to promote gender diversity in nursing programs must also consider recruitment strategies to increase male enrollment. Research suggests that outreach programs emphasizing leadership opportunities, career advancement potential, and the technical aspects of nursing can attract more male applicants [37]. Additionally, developing targeted scholarships and financial incentives for male students entering nursing may encourage broader participation. Furthermore, integrating gender inclusivity training into faculty development programs can help educators create a more equitable and supportive learning environment for male nursing students, reducing barriers to entry and retention.

While this study identifies a correlation between personality preferences and stress levels among nursing

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Table 3 MBTI-M personality dichotomies and NSC scores with the 95% confidence interval for the mean in different nursing programmes (N = 780)[a]

MBTI personality dichotomies		Five-year ADN n = 201	Four-year BSN n = 184	Two-year BSN (day programme) n = 178	Two-year BSN (evening programme) n = 217	All participants n = 780
E	n (%)	103 (51.2)	85 (46.2)	90 (50.6)	116 (53.5)	394 (50.5)
	95% CI	51.60–58.65	51.45–58.81	51.91–60.82	50.59–57.67	53.24–56.99
I	n (%)	98 (48.8)	99 (53.8)	88 (49.4)	101 (46.5)	386 (49.5)
	95% CI	58.56–65.52	55.19–62.73	62.37–69.67	57.43–64.53	60.08–63.68
p value		0.006**	0.154	0.001**	0.008**	< 0.001**
S	n (%)	87 (43.3)	84 (45.7)	75 (42.1)	95 (43.8)	341 (43.7)
	95% CI	55.51–62.99	54.07–62.50	55.85–64.49	53.81–61.63	56.80–60.78
N	n (%)	114 (56.7)	100 (54.3)	103 (57.9)	122 (56.2)	439 (56.3)
	95% CI	54.51–61.33	52.89–59.65	57.79–65.90	53.63–60.38	56.44–59.98
p value		0.604	0.454	0.582	0.786	0.671
T	n (%)	93 (46.3)	73 (39.7)	93 (52.2)	87 (40.1)	346 (44.4)
	95% CI	53.76–60.67	50.95–59.22	54.81–62.99	50.19–58.62	54.54–58.48
F	n (%)	108 (53.7)	111 (60.3)	85 (47.8)	130 (59.9)	434 (55.6)
	95% CI	55.98–63.22	55.12–62.03	59.32–67.86	56.11–62.42	58.25–61.79
p value		0.350	0.202	0.117	0.063	0.009**
J	n (%)	119 (59.2)	113 (61.4)	117 (65.7)	113 (52.1)	462 (59.2)
	95% CI	54.80–61.29	52.84–59.41	56.93–63.50	52.70–59.80	56.03–59.34
P	n (%)	82 (40.8)	71 (38.6)	61 (34.3)	104 (47.9)	318 (40.8)
	95% CI	55.15–63.17	54.40–63.37	56.94–68.89	54.82–62.15	57.43–61.76
p value		0.667	0.316	0.391	0.387	0.162

Abbreviations: *MBTI-M* Myers–Briggs Type Indicator (Form M), *NSC* Nurse Stress Checklist, *ADN* Associate degree in nursing, *BSN* Bachelor of science in nursing, *95% CI* 95% Confidence interval, *E* Extroversion, F Feeling, *I* Introversion, *J* Judging, *N* Intuition, *P* Perceiving, *S* Sensing, *T* Thinking

[a] Data missing for 12 participants with incomplete MBTI-M questionnaires

* p < 0.05

** p < 0.01

students, it is important to acknowledge its limitations, which preclude establishing causal relationships. Thus, we cannot definitively conclude that specific personality preferences directly influence stress levels. Future studies employing longitudinal research designs and more prominent, more diverse participant samples are needed to explore these associations more comprehensively.

Given the low representation of male students in nursing programs, future research should focus on understanding their unique stressors and experiences. Qualitative methods, such as focus groups or in-depth interviews, could provide deeper insights into the challenges faced by male nursing students and inform the development of targeted interventions. Addressing gender-specific barriers in nursing education will help create a more inclusive and supportive environment for all students.

Effective stress reduction strategies among nursing students can mitigate attrition rates and enhance the quality of care delivery [40]. Stress is an inherent aspect of nursing education, and personality differences influence individual coping mechanisms. Research indicates that identifying stress triggers can empower nursing students with valuable coping skills, such as problem-solving strategies and stress management techniques, to mitigate stressors [41]. Recognizing personality preferences as integral components of student learning environments can enable nursing faculty to develop targeted interventions that enhance resilience and academic success. Faculty members should remain cognizant that personality preferences may evolve as students transition from academic settings to clinical practice, requiring adaptable teaching approaches that cater to these changes.

Furthermore, self-care and personal development play a critical role in stress management. The study by Hensel and Laux [42] highlights that students who engaged in self-care practices, such as maintaining healthy interpersonal relationships and developing emotional resilience, experienced lower stress levels and a stronger sense of professional identity. Since stress can impact academic performance, career satisfaction, and workforce

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retention, integrating structured self-care training and resilience-building programs into nursing curricula is essential. Future research should explore the effectiveness of incorporating self-care and mindfulness-based interventions into nursing education to improve students' ability to manage stress across diverse personality types and educational settings.

By drawing comparisons with global research, this study underscores the universal relevance of personality-based stress management strategies and highlights the importance of integrating culturally adaptive interventions. In addition, addressing gender disparities in nursing education through tailored support programs and inclusive recruitment initiatives is vital for fostering a diverse and resilient nursing workforce. Enhancing gender diversity in nursing education not only benefits male students but also contributes to a more inclusive, representative, and effective healthcare system.

Limitations
Several limitations must be considered when interpreting the findings of this study. Firstly, the research was conducted at a single institution, which may restrict the generalizability of the results to the broader nursing student population in Taiwan. Secondly, the study included a limited representation of male nursing students, potentially limiting the applicability of the findings across genders within the nursing profession. Thirdly, while the NSC was employed to measure self-perceived stress among participants, it was initially developed to assess stress specifically in clinical nursing contexts; therefore, caution should be exercised when interpreting NSC results in the context of nursing education settings. Furthermore, selection bias may have been introduced due to the exclusion of participants with incomplete questionnaires, which might have affected the overall findings. Additionally, cultural factors—such as local societal values and educational norms—may influence how stress and personality preferences are perceived and reported, thereby limiting the generalizability of the results to other cultural contexts. Lastly, the cross-sectional design of this study precludes the determination of causality. It does not allow for assessing changes in stress perception over time, underscoring the need for longitudinal research.

Conclusions
Identifying the association between personality preferences and NSC scores as indicators of stress can benefit and strengthen various types of learners [36]. Understanding these differences among nursing students may enhance nursing education outcomes. Our findings suggest that evaluating and considering personality preferences should be integral to developing effective teaching strategies. To implement this, nursing programs should introduce personality assessments early in the curriculum and integrate customized stress management techniques, such as structured self-reflection for introverts and peer collaboration exercises for extroverts.

Future research should further explore the impact of personality-based stress management strategies on nursing students. Particularly, studies examining gender differences in personality preferences, with a focus on male nursing students, could help inform more inclusive educational policies and support systems. Moreover, exploring methods to attract students with diverse MBTI domain combinations to the nursing profession is recommended. Incorporating case-based learning, simulation exercises, and guided journaling tailored to specific personality traits may enhance students' stress resilience and coping mechanisms. Faculty training should also emphasize adapting instructional methods to accommodate diverse personality-driven learning styles.

Reducing stress among nursing students is essential for increasing nurse retention and reducing burnout as they transition into professional practice [13, 14, 43]. Mentorship programs that pair students with mentors who share similar coping styles can provide individualized support, fostering resilience and professional growth. Additionally, nursing institutions should implement structured wellness initiatives, including relaxation techniques, resilience workshops, and adaptive self-care plans designed to align with students' personality traits.

Integrating personality-based stress management strategies into nursing curricula is critical for improving student well-being, enhancing academic performance, and preparing future nurses for the complex demands of healthcare practice. By embedding these strategies into coursework, clinical training, and faculty mentoring, nursing programs can proactively equip students with the skills to manage stress effectively, ensuring long-term professional success and sustainability within the nursing workforce.

Implications for research, policy, and practice
This study identified three common personality preferences—ENFP, ISTJ, and ISFJ—that should be considered in nursing education. Recognizing the role of personality traits in stress perception and coping mechanisms can enhance teaching methodologies in both classroom and clinical settings. Educators can leverage this knowledge to design personalized instructional strategies, such as flexible online learning, project-based assignments, or self-paced clinical simulations that foster knowledge acquisition and skill development. By aligning teaching approaches with students' personality preferences, educators can create more engaging learning environments

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that enhance motivation and support career progression in healthcare management.

Beyond education, these findings have significant implications for nursing practice and policy. Understanding how personality traits influence stress responses can help healthcare institutions develop targeted interventions that promote psychological well-being, reduce burnout, and enhance overall job satisfaction. Hospitals and clinical settings could implement personality-based mentorship programs and support networks that provide tailored stress management resources for nurses. For instance, introverted nurses may benefit from structured self-reflection and mindfulness programs, whereas extroverted nurses might find peer support groups and collaborative problem-solving more effective.

Additionally, healthcare policymakers can integrate personality-informed strategies into workplace mental health initiatives, ensuring that interventions address diverse coping styles within the nursing workforce. By incorporating personality assessments into professional development programs, institutions can create more adaptive work environments that enhance resilience and job retention. A structured, personality-based approach to stress management may contribute to a healthier, more productive nursing workforce, ultimately improving patient care outcomes and reducing staff turnover.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12909-025-06960-y.

Supplementary Material 1.

Authors' contributions
Y. S. Li: Study design, data collection and analysis, writing of the initial manuscript, and review of the manuscript. Y. S. Li and B. H. Yang: Data collection and analysis, finalization of manuscript, and review of the manuscript. Y. S. Li, H. C. Tseng, B. H. Yang, W. P. Yu, and M. E. C. Mills: Supervision of study and revisions to the manuscript. The authors read and approved the final manuscript.

Data availability
The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
Ethical approval for this study was obtained from the Chang Gung University Institutional Review Board (No. 202002514B0). Informed consent was secured from all the students prior to their participation in the study. All methods were carried out in accordance with relevant guidelines and regulations.

Consent for publication
Agree to publish: Not applicable.

Competing interests
The authors declare no competing interests.

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