Original article

Clinical adjustment among nursing students in the clinical learning environment and associated factors at Hue University of Medicine and Pharmacy

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Abstract

Background: Clinical adjustment is increasingly recognized as a key indicator of nursing students' successful transition into clinical practice and has important implications for learning outcomes and professional development. Although clinical adjustment has received increasing attention in nursing education, little is known about its associated factors among nursing students in Vietnam.

Objectives: To assess clinical adjustment among third-year nursing students and examine factors associated with clinical adjustment during their first clinical placement.

Materials and Methods: A cross-sectional survey was conducted among 161 third-year nursing students at Hue University of Medicine and Pharmacy, Hue University. Participants completed a structured questionnaire that assessed demographic, academic, and clinical learning characteristics, perceived social support, and clinical adjustment using the Clinical Adjustment Scale for Student Nurses (CAS-SN). Factors associated with clinical adjustment were identified through multiple linear regression analysis.

Results: The mean clinical adjustment score was 3.82 ± 0.33, with Professional Growth and Interpersonal Engagement achieved the highest subscale score, whereas Coping and Support Strategies scored the lowest. Multiple linear regression analysis identified four variables significantly associated with clinical adjustment: perceived social support (β = 0.28, $p < 0.001$), positive nurses' attitudes toward students (β = 0.22, $p < 0.01$), confidence in clinical practice skills (β = 0.19, $p = 0.04$), and good academic performance (β = 0.15, $p = 0.03$). The final model explained 33.8% of the variance in clinical adjustment (adjusted R^2 = 30.7%).

Conclusion: Third-year nursing students reported clinical adjustment following their initial clinical placement, as assessed using the CAS-SN. Perceived social support, positive nurses' attitudes toward students, confidence in clinical practice skills, and academic performance were independently associated with clinical adjustment, with perceived social support showing the strongest association. These findings identify supportive relationships, clinical confidence, and academic preparedness as relevant areas for further research and consideration in nursing education during early clinical training.

Keywords: *clinical adjustment; clinical learning environment; clinical education; nursing students; social support.*

1. INTRODUCTION

Clinical education bridges classroom learning and professional practice, allowing nursing students to develop essential clinical competence and professional identity. Clinical adjustment to the clinical learning environment is fundamental to optimizing learning outcomes, professional development, and readiness for future nursing practice [1, 2]. However, adapting to clinical placements can be challenging because of unfamiliar responsibilities, complex healthcare settings, and increasing professional expectations, which may adversely affect students' confidence and learning experience [3].

Successfully responding to these challenges requires effective clinical adjustment, defined as nursing students' cognitive, emotional, behavioral, and interpersonal adaptation to the clinical learning environment [3]. Emerging evidence indicates that students with better clinical adjustment demonstrate greater academic adjustment, improved psychological well-being, and stronger persistence in nursing education, highlighting its importance for successful clinical learning [3, 4].

Stress and anxiety primarily capture psychological and emotional responses to challenging or unfamiliar situations, whereas satisfaction reflects students' evaluations of their clinical experiences. Perceptions of the clinical learning environment, in turn, concern students' appraisals of the physical, psychosocial, organizational, and teaching–learning characteristics

of the clinical context [1, 5, 6]. Clinical adjustment is conceptually broader, referring to students' adaptation across cognitive, emotional, behavioral, professional, and interpersonal domains in response to the demands of clinical practice [3]. Thus, clinical adjustment captures the students' adaptation process itself rather than a single emotional response or an evaluation of the clinical environment.

Clinical adjustment may be shaped by interactions between individual and contextual conditions. Meleis' Transitions Theory conceptualizes successful transition as being influenced by personal, interpersonal, and contextual conditions that facilitate or hinder clinical adaptation to new roles and environments [7]. From this perspective, perceived social support and supportive relationships with clinical nurses may provide interpersonal and contextual resources that facilitate students' adjustment. In addition, Social Cognitive Theory emphasizes the role of perceived self-efficacy in human agency, with individuals' beliefs in their capabilities influencing motivational processes, effort, persistence, and action [8]. Accordingly, students' confidence in performing clinical practice skills may be relevant to their ability to engage with clinical demands and adapt to the clinical learning environment. Academic preparedness may also support students in integrating theoretical knowledge with clinical experiences.

Although these theoretical perspectives provide a basis for considering both individual and environmental factors, empirical evidence regarding clinical adjustment among nursing students remains limited in Vietnam. Existing Vietnamese studies have predominantly examined stress, anxiety, or satisfaction with clinical learning environments rather than clinical adjustment as a multidimensional outcome [9-11]. Therefore, evidence remains insufficient regarding how nursing students adapt to the cognitive, professional, and interpersonal demands of clinical practice and which individual and clinical learning-related characteristics are associated with this adaptation.

Third-year nursing students were selected because, within the four-year Bachelor of Nursing program in our university, they begin their first sustained clinical training after completing the foundational theoretical and skills-based components of the curriculum. This transition provides an important context in which students encounter authentic patient care, professional responsibilities, and interactions with healthcare professionals. Examining clinical adjustment at this stage may therefore provide useful evidence regarding students' adaptation during the early phase of sustained clinical education.

Therefore, this study aimed to assess clinical adjustment among third-year nursing students in University of Medicine and Pharmacy, Hue University and to identify factors associated with clinical adjustment.

2. METHODS

2.1. Study setting

The study was conducted at Hue University of Medicine and Pharmacy, Hue University that offers a four-year Bachelor of Nursing program. Within this program, third-year nursing students begin their first period of sustained clinical training at affiliated healthcare facilities, where they rotate through various clinical departments under the supervision of nurse educators, clinical instructors, and clinical nurses.

Data were collected in October 2025 after participants had completed their first 8-week clinical placement. At the time of the survey, students had gained sufficient exposure to the clinical learning environment and accumulated diverse clinical experiences to meaningfully evaluate their clinical adjustment. Conducting the survey after the initial clinical placement ensured that participants had experienced direct patient care, interdisciplinary collaboration, and the academic, professional, and interpersonal demands of clinical practice.

2.2. Study design

This was a cross-sectional analytical study reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.

2.3. Sample size and sampling

The study population comprised third-year undergraduate nursing students enrolled in a four-year Bachelor of Nursing program at Hue University of Medicine and Pharmacy, Hue University. Eligible participants were full-time third-year nursing students who were undertaking clinical placements at affiliated healthcare facilities during the study period and voluntarily agreed to participate. Students who were absent during data collection or returned incomplete questionnaires were excluded.

The required sample size was estimated using G*Power version 3.1.9.7 for multiple linear regression analysis (F-test: Fixed model, R^2 deviation from zero), assuming an effect size (f^2) of 0.15, a significance level (α) of 0.05, a statistical power of 0.95, with seven predictors. The minimum required

sample size was 153 participants.

A convenience sampling method was employed by inviting all eligible students to participate. Of the 174 eligible students, 169 voluntarily agreed to participate, yielding a response rate of 97.1%. After excluding eight questionnaires with incomplete responses, data from 161 participants were included in the final analysis, exceeding the minimum required sample size.

2.4. Theoretical framework

The present study was informed by two complementary theoretical perspectives used primarily to contextualize the observed associations. Meleis' Transitions Theory provides a framework for understanding clinical placement as a transition in which students encounter changes in roles, relationships, expectations, and clinical environments, with social support representing an important facilitating condition [7]. Social Cognitive Theory provides a complementary perspective for interpreting the role of students' confidence in their clinical practice skills. These perspectives were used to guide the interpretation of the findings rather than to establish causal relationships among the study variables [8].

2.5. Data collection

Data were collected using a structured self-administered questionnaire developed based on the study objectives. The questionnaire consisted of two sections.

The first section collected participants' demographic, academic, and clinical learning-related characteristics. Demographic and academic variables included age, gender, academic performance, and engagement in part-time clinical practice outside academic hours. Clinical learning-related variables included self-confidence in clinical practice skills, nurses' attitudes toward students during clinical practice, satisfaction with clinical practice, and perceived social support during clinical practice. Perceived social support was measured using the Social Support Scale for Nursing Students in Clinical Practice developed by Park and Park (2023). The scale consists of 17 items across three domains: support from family and friends, support from school, professors and clinical instructors, and support from senior nursing students. Items are rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher mean scores indicating greater perceived social support. The original instrument demonstrated excellent internal consistency (Cronbach's $\alpha = 0.93$) [12].

The second section assessed clinical adjustment using the Clinical Adjustment Scale for Student Nurses (CAS-SN), developed by Labrague et al. (2024). The CAS-SN comprises 15 items across three domains: professional development and interpersonal engagement, clinical competence and confidence, and coping strategies and support. Responses are rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher mean scores indicate better clinical adjustment. The original scale demonstrated excellent internal consistency (Cronbach's $\alpha = 0.91$) [3].

Permission to use the original English versions of the CAS-SN and the Social Support Scale for Nursing Students in Clinical Practice was obtained from the respective original authors. The instruments were translated and culturally adapted into Vietnamese following the guidelines proposed by Cruchinho *et al.* [13]. The translation process included forward translation into Vietnamese, reconciliation of the translated versions, back-translation by an independent bilingual translator blinded to the original instruments, and comparison with the original versions to ensure semantic and conceptual equivalence.

Content validity was subsequently assessed by four nursing experts with master's or doctoral degrees in nursing. Each expert independently evaluated the relevance of each item using a four-point relevance scale (1 = not relevant, 2 = somewhat relevant, 3 = quite relevant, and 4 = highly relevant). The item-level content validity index (I-CVI) was calculated as the proportion of experts who rated an item as either 3 or 4, while the scale-level content validity index (S-CVI) was calculated as the average of the I-CVI values across all items. The CAS-SN demonstrated acceptable to excellent content validity, with I-CVI values ranging from 0.75 to 1.00 and an S-CVI of 0.98. The Social Support Scale for Nursing Students in Clinical Practice also demonstrated acceptable to excellent content validity, with I-CVI values ranging from 0.75 to 1.00 and an S-CVI of 0.97. Internal consistency reliability was assessed using the main study sample, yielding Cronbach's α coefficients of 0.83 for the CAS-SN and 0.87 for the Social Support Scale.

Participants completed anonymous self-administered paper-based questionnaires under the guidance of trained research team members. The questionnaires took approximately 15 minutes to complete and were collected immediately to check for completeness. All responses were anonymized, and the data were used solely for research purposes.

2.6. Data analysis

Data were analysed using IBM SPSS Statistics

version 26.0. Descriptive statistics were used to summarize participants' characteristics and study variables. Categorical variables were presented as frequencies and percentages, whereas continuous variables were expressed as means and standard deviations. The distribution of continuous variables was assessed using the Kolmogorov–Smirnov and Shapiro–Wilk tests. Independent-samples *t*-tests, one-way analysis of variance (ANOVA), and Pearson's correlation were used to examine the associations between participant characteristics, study variables, and clinical adjustment. For categorical variables with more than two categories, one-way ANOVA was performed when the relevant assumptions were met, followed by appropriate post-hoc comparisons.

Multiple linear regression was performed to identify factors associated with clinical adjustment. Variables with $p < 0.20$ in the preliminary analyses and variables considered theoretically relevant were included in the regression model. Categorical variables were dummy-coded, with reference categories specified in the Results. Because only two participants reported dissatisfaction with clinical practice (n = 2), this category was not included as a separate category in the regression analysis because of its very small sample size; these participants were retained in the descriptive analyses. Multicollinearity was assessed using tolerance and variance inflation factor (VIF). The assumptions of linearity, independence, homoscedasticity, and normality of residuals were assessed before interpreting the regression model. Unstandardized regression coefficients (B), standard errors (SE), standardized coefficients (β), 95% confidence intervals (CIs), and *p* values were reported. A two-tailed $p < 0.05$ was considered statistically significant.

2.7. Ethical consideration

Ethical approval for the study was obtained from the Institutional Review Board of Hue University of Medicine and Pharmacy, Hue University, on June 30, 2025 (Approval No. H2025/579). Before data collection, all participants received information regarding the study objectives, procedures, voluntary nature of participation, and their right to withdraw at any time without penalty. Informed consent was implied through the voluntary completion and return of the anonymous self-administered questionnaire. All data were collected anonymously and used exclusively for research purposes in accordance with the principles of the Declaration of Helsinki.

3. RESULTS

Table 1. General characteristics of participants (N = 161)

Variables		Frequency (n)	Percentage (%)
Age	Mean ± SD (Range)	20.05 ± 0.22 (20 – 21)	
Gender	Female	152	94.4
	Male	9	5.6
Academic Performance	≤ Average/Pass	49	30.4
	≥ Good	112	69.6
Engagement in part-time clinical practice outside academic hours	Yes	134	83.2
	No	27	16.8
Self-confidence in clinical practice skills	Not confident	25	15.5
	Moderately confident	115	71.4
	Confident	21	13.0
Nurses' attitudes toward students during clinical practice	Neutral	65	40.4
	Positive	96	59.6
Satisfaction with clinical practice	Dissatisfied	2	1.2
	Neutral	48	29.8
	Satisfied	111	68.9
Perceived social support	Mean ± SD (Range)	3.73 ± 0.40 (2.65 – 4.88)	

Among the 161 participants, most were female (94.4%) and had good or higher academic performance (69.6%). Most students reported participating in part-time clinical practice outside academic hours (83.2%).

Regarding clinical learning characteristics, 71.4% reported moderate confidence in their clinical practice skills, 59.6% perceived nurses' attitudes as positive, and 68.9% were satisfied with their clinical practice. The mean perceived social support score was 3.73 ± 0.40 (Table 1).

Table 2. Mean scores of clinical adjustment and its subscales (N = 161)

Variables	Mean ± SD	Min – Max
Clinical Adjustment (15 items)	3.82 ± 0.33	2.93 – 4.80
Factor 1: Professional Growth and Interpersonal Engagement (6 items)	4.19 ± 0.40	3.17 – 5.0
Factor 2: Clinical Competence and Confidence (6 items)	3.65 ± 0.42	2.33 – 4.83
Factor 3: Coping and Support Strategies (3 items)	3.40 ± 0.45	2.00 – 4.33

The mean clinical adjustment score was 3.82 ± 0.33. Among the three dimensions, Professional Growth and Interpersonal Engagement had the highest mean score (4.19 ± 0.40), whereas Coping and Support Strategies had the lowest (3.40 ± 0.45) (Table 2).

Table 3. Association between clinical adjustment and general characteristics of participants (N = 161)

Variables		Clinical Adjustment	p	Post-hoc
Age		r = 0.06	0.48*	
Gender	Female	3.81 ± 0.33	0.26**	
	Male	3.94 ± 0.43		
Academic Performance	≤ Average/Pass	3.73 ± 0.30	**0.02****	
	≥ Good	3.86 ± 0.34		
Engagement in part-time clinical practice outside academic hours	Yes	3.84 ± 0.33	**0.03****	
	No	3.69 ± 0.35		
Self-confidence in clinical practice skills	Not confident[a]	3.62 ± 0.35	**< 0.001*****	b > a (p = 0.01) c > a (p < 0.001)
	Moderately confident[b]	3.83 ± 0.32		
	Confident[c]	4.00 ± 0.25		
Nurses' attitudes toward students during clinical practice	Neutral	3.66 ± 0.31	**< 0.001****	
	Positive	3.93 ± 0.31		
Satisfaction with clinical practice	Dissatisfied[a]	3.50 ± 0.61	**< 0.001*****	c > b (p < 0.001)
	Neutral[b]	3.66 ± 0.29		
	Satisfied[c]	3.89 ± 0.32		
Perceived social support		r = 0.44	**< 0.001***	

** Pearson's correlation, ** Independent-samples t-test, *** One-way ANOVA*

The results in Table 3 indicated that clinical adjustment was significantly associated with academic performance, engagement in part-time clinical practice, self-confidence in clinical practice skills, nurses' attitudes toward students, satisfaction with clinical practice, and perceived social support ($p < 0.05$). No significant associations were observed for age or gender.

Table 4. Multivariable linear regression analysis of factors associated with clinical adjustment (N = 161)

Variables	Unstandardized Coefficients		Standardized Coefficients	95% CI	p	Collinearity Statistics	
	B	SE	β			Tolerance	VIF
Academic Performance (≥ Good vs. ≤ Average/Pass)	0.11	0.05	0.15	0.01 – 0.21	**0.03**	0.93	1.07
Engagement in part-time clinical practice outside academic hours	0.05	0.06	0.06	- 0.07 – 0.17	0.43	0.90	1.11
Self-confidence in clinical practice skills (Moderately confident vs. Not confident)	0.11	0.06	0.15	- 0.02 – 0.24	0.09	0.57	1.76
Self-confidence in clinical practice skills (Confident vs. Not confident)	0.19	0.09	0.19	0.01 – 0.36	**0.04**	0.54	1.87
Nurses' attitudes toward students during clinical practice (Positive vs. Neutral)	0.15	0.05	0.22	0.05 – 0.25	**< 0.01**	0.73	1.37
Perceived social support	0.24	0.06	0.28	0.12 – 0.36	**< 0.001**	0.83	1.21
Satisfaction with clinical practice (Satisfied vs. Neutral)	0.09	0.05	0.12	- 0.17 – 0.19	0.09	0.79	1.26
F = 11.14; p* = < 0.001; R^2 = 33.8%, Adjusted R^2 = 30.7%							

Multiple linear regression analysis showed that perceived social support had the largest standardized association with clinical adjustment (β = 0.28, p < 0.001), followed by positive nurses' attitudes toward students (β = 0.22, p < 0.01), confidence in clinical practice skills (β = 0.19, p = 0.04), and good academic performance (β = 0.15, p = 0.03). The final model explained 33.8% of the variance in clinical adjustment (adjusted R^2 = 30.7%) (Table 4).

4. DISCUSSION

4.1. Clinical adjustment among third-year nursing students

Participants in the present study had a mean clinical adjustment score of 3.82 ± 0.33 on the CAS-SN. Because higher CAS-SN scores indicate better clinical adjustment, this score provides a descriptive indication of students' reported clinical adjustment following the initial clinical placement. Given that higher CAS-SN scores indicate better clinical adjustment, the observed mean score reflects students' reported adaptation across the cognitive, professional, and interpersonal domains assessed by the CAS-SN. However, this finding should be interpreted descriptively, as the CAS-SN does not provide an established cut-off for categorizing clinical adjustment into specific levels. The mean score observed in the present study is comparable to findings reported in previous studies of clinical adjustment among nursing students [3, 4]. One possible explanation is that the survey was conducted after an 8-week clinical placement, during which students may have had opportunities to become more familiar with clinical routines, patient care responsibilities, and interactions with healthcare professionals. Consistent with this explanation, longitudinal evidence suggests that continued clinical exposure promotes the development of clinical competence and facilitates students' adaptation throughout clinical training [14].

The higher score for Professional Growth and Interpersonal Engagement and the lower score for Coping and Support Strategies indicate differences in the pattern of students' reported clinical adjustment across domains. The relatively lower score for Coping and Support Strategies may indicate an area requiring greater attention during early clinical education. Similar patterns have been reported in recent studies: nursing students gradually gain confidence and professional competence as clinical exposure progresses [14], yet continue to experience psychological stress and uncertainty that require

effective coping strategies and supportive learning environments [15, 16]. These findings highlight that clinical adjustment encompasses not only clinical competence but also students' coping and use of supportive resources. This may also explain why perceived social support emerged as the strongest factor associated with clinical adjustment in the present study, a finding discussed in the following section.

4.2. Factors Associated with Clinical Adjustment

Clinical learning environment and support-related factors

The present study found that support-related factors, particularly perceived social support and positive nurses' attitudes toward students, were independently associated with clinical adjustment. Among these factors, perceived social support showed the strongest association with clinical adjustment, indicating that supportive relationships were strongly associated with students' reported clinical adjustment. This finding is consistent with previous studies indicating that emotional, informational, and practical support from clinical instructors, nurse educators, peers, and family is associated with greater confidence, resilience, and coping capacity among nursing students during clinical placements [4, 12, 17]. According to Meleis' Transitions Theory, social support is an important facilitating condition that promotes healthy transitions by helping individuals manage new roles and unfamiliar environments [7]. In the context of clinical education, supportive relationships may be related to lower uncertainty and a greater sense of belonging within the clinical learning environment [7, 18, 19].

Positive nurses' attitudes toward students also remained significantly associated with clinical adjustment after adjustment for other variables. Clinical nurses are often the healthcare professionals with whom students interact most frequently during clinical placements, and their willingness to provide guidance, constructive feedback, and emotional support may be associated with students' learning experiences. Previous studies have shown that supportive relationships with clinical nurses and effective clinical supervision foster students' sense of belonging, professional development, satisfaction with clinical placements, and engagement in clinical learning, whereas unsupportive interactions may negatively affect learning experiences and clinical adaptation [2, 17, 20-22]. These findings highlight the relevance of a supportive clinical learning environment to nursing students' clinical adjustment. In practice, clinical nurses and educators may consider providing clear guidance, constructive feedback, and supportive interactions during students' early clinical placements.

These findings should be interpreted within the context of nursing education at Hue University of Medicine and Pharmacy, Hue University. The four-year Bachelor of Nursing program provides students with foundational theoretical knowledge and skills-based training before they enter sustained clinical education in the third year. At this stage, students move from the structured university learning environment to authentic clinical settings, where they interact directly with patients, clinical nurses, nurse educators, and other healthcare professionals. The initial sustained clinical placement therefore represents an important transition in students' learning experience, requiring them to apply previously acquired knowledge and skills while adapting to new clinical roles, relationships, and expectations. In this context, the associations of clinical adjustment with perceived social support, nurses' attitudes toward students, confidence in clinical practice skills, and academic performance may reflect the interplay between students' prior preparation and the support available within the clinical learning environment.

Individual-related factors

In addition to environmental influences, individual characteristics also played an important role in clinical adjustment. Students with greater confidence in their clinical practice skills had higher clinical adjustment scores. Although the present study assessed self-confidence rather than self-efficacy, this finding is consistent with Social Cognitive Theory, which proposes that individuals who believe in their capabilities are more likely to demonstrate persistence, motivation, and adaptive behaviours when encountering challenging situations [8].

Students who reported greater confidence in performing clinical procedures may also be more engaged in patient care, more likely to seek learning opportunities, and more comfortable communicating with clinical staff. These characteristics may be related to better clinical adjustment. Previous nursing education studies have similarly reported that students with greater clinical confidence demonstrate stronger clinical competence, higher engagement in clinical learning, and more clinical adjustment during clinical placements [2, 3, 14]. Conversely, limited confidence may be associated with greater anxiety or hesitation during patient care, which may also be related to students' clinical

adjustment [15].

Good academic performance was also independently associated with higher clinical adjustment scores. Students with stronger academic achievement are more likely to possess a solid theoretical foundation and effective learning skills, which may support the integration of classroom knowledge with clinical experiences. Similar findings have been reported among psychiatric nursing students, in whom school performance was identified as one of the main factors associated with clinical practice maladjustment, alongside personality and career decision-making self-efficacy [23]. Because clinical adjustment encompasses not only professional growth and interpersonal engagement but also clinical competence and confidence [3], academic preparedness may be associated with clinical adjustment by providing a stronger foundation for applying theoretical knowledge and clinical skills. Overall, the findings indicate that clinical adjustment is associated with both the clinical learning environment and individual preparedness.

The multivariable model explained 33.8% of the variance in clinical adjustment (adjusted R^2 = 30.7%), indicating that the factors examined in this study accounted for a meaningful but incomplete proportion of variation in students' clinical adjustment. This finding suggests that other factors not assessed in the present study may also contribute to clinical adjustment, including characteristics of the clinical learning environment, quality of supervision, psychological resources, interpersonal relationships, and other contextual factors. Therefore, the identified associations should be interpreted as part of a broader set of potential influences rather than as a comprehensive explanation of clinical adjustment.

From an educational perspective, these findings identify several areas that may warrant attention during students' initial clinical placement. Social support may be strengthened through accessible clinical instructors, nurse educators, peers, and other sources of support. Positive nurses' attitudes may be supported through clear communication, constructive feedback, and respectful nurse–student interactions. Students' confidence in clinical practice skills may be addressed through adequate skills preparation and opportunities for supervised practice before and during clinical placement. Academic preparedness may be supported by strengthening the integration of theoretical knowledge and clinical skills before students enter clinical settings. These implications should be interpreted as potential areas for educational attention rather than as evidence that specific interventions would cause improvements in clinical adjustment.

Non-significant findings

Although engagement in part-time clinical practice outside academic hours and satisfaction with clinical practice were significantly associated with clinical adjustment in the univariate analyses, these associations were no longer significant after adjustment for other variables, suggesting that their apparent effects may have been explained by stronger environmental and individual factors. Previous qualitative research indicates that the influence of part-time clinical work on nursing students' professional development is complex. While some students report increased confidence, practical skills, and familiarity with clinical practice, others experience role ambiguity, workload burden, and challenges in balancing employment with academic responsibilities, resulting in inconsistent educational benefits [24]. This finding is also consistent with Meleis' Transitions Theory, which proposes that clinical adjustment is shaped by the interaction of personal, interpersonal, and contextual conditions rather than by any single experience [7]. This perspective is supported by evidence identifying social support, role clarity, and clinical preparedness as key factors influencing nursing students' adjustment during clinical internships [25]. Similarly, no significant associations were observed between age, gender, and clinical adjustment, which may partly reflect the relatively homogeneous characteristics of the study sample, as all participants were third-year nursing students of similar age and educational background. Although examining clinical competence rather than clinical adjustment, Ogunmuyiwa *et al.* likewise reported that age was not a significant predictor, whereas evidence regarding gender remains inconsistent across studies [26]. Collectively, these findings suggest that environmental support and individual preparedness were more closely associated with clinical adjustment than demographic or experiential characteristics in this study

Strengths and limitations

This study has several strengths, including the examination of clinical adjustment among nursing students using the Clinical Adjustment Scale for Student Nurses and the use of culturally adapted instruments with satisfactory internal consistency and a high response rate. Nevertheless, several limitations should be acknowledged. First, although all eligible students were invited to participate,

the study used convenience sampling at a single university, which may introduce selection bias and limits the generalizability of the findings to nursing students in other institutions or regions. Second, the cross-sectional design prevents determination of temporal relationships or causal inferences between the identified factors and clinical adjustment. Reverse causality cannot therefore be excluded; for example, students with better clinical adjustment may perceive greater social support or more positive interactions with clinical nurses. Third, all variables were measured using self-reported questionnaires collected at the same assessment point, which may introduce common method bias and social desirability bias. Fourth, clinical adjustment was assessed after the initial 8-week clinical placement at a single time point; therefore, changes in adjustment over the course of clinical education could not be examined. Future multicentre longitudinal studies with repeated measurements and, where feasible, objective or multi-source measures are needed to further clarify temporal relationships and changes in clinical adjustment.

5. CONCLUSION

The CAS-SN findings describe clinical adjustment among third-year nursing students following their first sustained clinical experience. Perceived social support, nurses' attitudes toward students, confidence in clinical practice skills, and academic performance were independently associated with clinical adjustment, with social support showing the strongest association. These findings suggest that supportive relationships, students' clinical confidence, and academic preparedness warrant consideration in early clinical nursing education and further investigation through longitudinal research.

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Competing interests

The authors declare that they have no competing interests.

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Declaration of Generative AI Use

During the preparation of this manuscript, the authors used generative AI tools for language editing and improving clarity and readability. The authors reviewed and verified all AI-assisted content and take full responsibility for the manuscript.

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