

## Research article

# Development and psychometric testing of the clinical adjustment scale for student nurses (CAS-SN): A scale for assessing student nurses' adaptation in clinical settings

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## ABSTRACT

**Background:** Nurse education is critical for preparing student nurses for clinical practice, but the transition to clinical settings poses numerous challenges. A standardized scale to assess student nurses' adjustment in the clinical area is lacking in the Philippines.

**Objective:** This paper described the development and evaluation of the Clinical Adjustment Scale for Student Nurses (CAS-SN).

**Design:** An exploratory sequential research design.

**Settings:** Nursing schools in three government owned universities in the Philippines.

**Methods:** Expert panels and field pretesting established content and face validity. Inter-item and inter-total correlations and Cronbach's  $\alpha$  were used to assess the reliability of the scale. Construct validity was evaluated using exploratory factor analysis (EFA). Criterion validity was evaluated with established measures.

**Results:** The CAS-SN comprises 15 items across three subscales: (1) Professional Growth and Interpersonal Engagement, (2) Clinical Competence and Confidence, and (3) Coping and Support Strategies

Reliability was excellent and the validity was satisfactory, with significant correlations with academic adjustment, psychological distress, and dropout intention.

**Conclusion:** The CAS-SN was found to be a valid and a reliable for assessing student nurses' clinical adjustment.

**Implications for nurse education:** The CAS-SN provides a structured framework to assess and monitor student nurses' clinical adaptation, enhancing our understanding of their competence, resilience, and professional identity development. Its integration into nurse education programs can significantly improve the assessment of clinical learning experiences and contribute to better student learning outcomes.

## 1. Introduction

Clinical training is a fundamental component of nursing education, serving as a critical link between theoretical learning and practical application for student nurses (Lee et al., 2023). It provides a unique opportunity for nursing students to put their classroom knowledge into practice, hone essential clinical skills, and immerse themselves in real-world healthcare settings (Woo & Newman, 2020). This experiential learning environment enables students to engage with diverse patient

populations, observe and participate in patient care activities, and collaborate with multidisciplinary healthcare teams (Pienaar et al., 2022; Zhang et al., 2022). Through hands-on experiences, students gain invaluable insights into the complexities of patient care, ethical decision-making, and effective communication with patients, families, and healthcare professionals (Jaganath et al., 2022). Moreover, it fosters the development of clinical judgment and problem-solving abilities, which are essential attributes for competent and compassionate nursing practice (Labrague, 2024).

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Transitioning to the clinical setting is daunting for nursing students, necessitating adaptation to new environments, responsibilities, and clinical demands (Hampton et al., 2020). Challenges include managing patient care, adapting to diverse clinical settings, and collaborating within healthcare teams (Loureiro et al., 2024). Emotional stressors such as witnessing distressing patient conditions and grappling with ethical dilemmas profoundly affect students' emotional well-being and clinical adjustment (Panda et al., 2021). The shift from classroom to clinical settings demands rapid adaptation to new routines, roles, and patient care expectations, compounded by the need for effective communication and empathetic care (McCloughen et al., 2020; Loureiro et al., 2024). The importance of clinical adjustment has been further underscored by the challenges posed during the COVID-19 pandemic. Nursing students have faced unprecedented circumstances, including heightened infection control measures, limited patient interactions, and shifts in clinical placements (Labrague, 2023). These factors have not only intensified the existing stressors of clinical practice but also necessitated rapid adaptation to new healthcare protocols and technologies, impacting students' clinical learning experiences and professional preparedness (Yazici and Ökten, 2022).

Successful clinical adjustment is crucial for nursing students as it enhances their ability to deliver competent and compassionate care, thereby improving patient outcomes (Woo and Newman, 2020). Conversely, poor clinical adjustment can lead to significant stress, anxiety, and emotional exhaustion among students, affecting their confidence, academic performance, and potentially leading to attrition from nursing programs (Rodríguez-García et al., 2021; Hwang and Kim, 2022). While numerous studies have explored the challenges and experiences of nursing students during clinical rotations (Rodríguez-García et al., 2021; Panda et al., 2021), there remains a notable absence of a standardized tool to assess their clinical adjustment in the Philippines.

Unlike existing scales that predominantly focus on academic adjustment, such as the Chinese College Student Adjustment Scale (CCSAS) (Xiaoyi et al., 2005), the Student Adaptation to College Questionnaire (SACQ) (Baker and Siryk, 1989), the Campus Life Adaptation Scale (Park and Kim, 2019), and the Adaptation to College Life Scale (ACLS) (Aladağ et al., 2003), there is a clear need for a tailored instrument that specifically evaluates the unique challenges and adaptations required in clinical settings. For instance, the CCSAS assesses adaptation across various domains such as interpersonal relationships, learning, and emotional adaptation (Xiaoyi et al., 2005), but does not address the specific nuances of clinical practice environments that are crucial for nursing students. The SACQ, while valuable for assessing personal and social adjustment in academic contexts (Baker and Siryk, 1989), lacks specificity regarding the clinical skills and professional competencies required in nursing practice. Similarly, the Campus Life Adaptation Scale focuses on nursing undergraduates' adaptation to campus life (Park and Kim, 2019), which may not fully capture the complexities of clinical adaptation. The ACLS, although measuring social, emotional, personal, academic, and university environment adjustment among university students (Aladağ et al., 2003), does not adequately address the clinical skills development and professional adaptation unique to nursing education.

Developing a standardized scale to measure student nurses' adaptation in clinical settings is essential for several reasons. First, it will provide nurse educators with a comprehensive tool to systematically evaluate students' adaptation to clinical environments, identifying both facilitators and barriers to their clinical adjustment. Additionally, it will enable support strategies to enhance students' clinical learning experiences, ultimately contributing to improved student outcomes and preparedness for professional practice. Therefore, this study aimed to fill the existing gap in the literature by developing and validating a scale tailored specifically to assess student nurses' adaptation in clinical settings. By addressing the unique challenges and requirements of clinical practice, this scale seeks to provide a robust framework for assessing and enhancing students' clinical adjustment, thereby advancing nursing

education and practice.

### 1.1. Research aim

This study was undertaken to develop and psychometrically test the Clinical Adjustment Scale for Student Nurses (CAS-SN), to comprehensively assess clinical adjustment among student nurses during their clinical placements.

## 2. Methods

### 2.1. Study design

The research utilized an exploratory sequential mixed methods design, a well-suited approach when there is limited existing knowledge on the research topic (Kettles et al., 2011). This design combines qualitative and quantitative methods in two distinct phases. In the qualitative phase, data were gathered through interviews to gain valuable insights into the concept or phenomenon and identify key themes related to the research topic. This phase helps to develop a theoretical framework or inform the development of measurement instruments. In the subsequent quantitative phase, the newly developed scale was evaluated on a larger sample to assess its reliability and validity (Ivanova et al., 2006). This sequential process ensures that the quantitative measures are grounded in the qualitative findings, providing a comprehensive understanding of the research topic and ensuring that the developed scale accurately reflects the underlying constructs.

### 2.2. Study procedure

#### 2.2.1. Item generation

Based on the recommendations made by Boateng et al. (2018) for scale development, this study adopted a systematic approach to construct the scale. The process incorporated both inductive and deductive methods to generate items for the desired scale. Initially, a deductive approach was undertaken, through a thorough review of relevant literature. Through this literature review, a pool of 12 initial items was established, reflecting the key dimensions of the concept under investigation. To further deepen our understanding beyond theoretical perspectives, individual interviews using an inductive approach were conducted (see Table 1 for the interview questions). This qualitative phase involved 10 student nurses, aiming to gain deeper insights into their experiences of clinical adjustment during their placements. Participants were encouraged to share both positive and negative experiences, providing specific instances or examples that highlight their interactions and challenges in clinical settings. The interviews with these students were analyzed through content analysis, revealing four key themes. These included perceptions of clinical competence, reflecting on students' readiness and skills. Adaptation to clinical environments emerged as another theme, detailing how students adjusted to diverse settings. Emotional and psychological challenges were highlighted, illustrating the stress management and emotional aspects of clinical practice. Support and mentorship were emphasized for their positive impact on students' learning and adjustment experiences.

Through qualitative content analysis of the individual interviews, a set of 18 new items was generated. These items, along with those initially identified from the literature review, underwent rigorous review, comparison, and contrast to ensure their relevance and alignment with the research objectives. The integration of both deductive and inductive methods in item generation allowed for a comprehensive exploration of the concept, ensuring the scale captured the diverse experiences of clinical adjustment among student nurses.

#### 2.2.2. Content validity and face validity

The panel involved in the content validation process of the clinical

**Table 1**

## Interview questions.

1. Could you describe a specific challenge you faced during your clinical rotations and how you adapted to overcome it?
2. What support or resources do you feel would have been helpful in facilitating your adjustment to the clinical setting as a student nurse?
3. How do you perceive your level of confidence and preparedness in applying theoretical knowledge to practical situations during your clinical experiences?

adjustment scale for nursing students comprised a team of 10 senior nurse faculty members with extensive clinical and academic experience, each possessing over a decade of tenure in nursing education. Content validity was assessed using the Content Validity Index (CVI) at both the item level (I-CVI) and the scale level (S-CVI/average). Each panel rated both the relevance and clarity of each item using a four-point scale, which ranged from “not relevant” to “highly relevant” with scores of 1 to 4, respectively. The I-CVI for each item was calculated by dividing the number of experts who rated the item as either 3 or 4 points by the total number of experts. An I-CVI value above 0.79 indicated that an item was relevant and appropriate for inclusion in the scale, while an I-CVI between 0.70 and 0.79 suggested the need for item revisions. Items with an I-CVI below 0.70 were considered for elimination from the scale. The overall content validity of the scale was determined by calculating the S-CVI/average, which represented the average I-CVI score across all items. To meet the criterion for an acceptable scale, the S-CVI/average needed to be 0.90 or higher (Yusoff, 2019). A field pre-testing was conducted by administering the draft survey items to a sample of 20 students to examine the face validity of the scale. The pretest was undertaken to ensure that the items in the newly developed scale were relevant and easily understood by the intended respondents before implementing the survey on a larger scale.

### 2.2.3. Construct validity

To evaluate the construct validity of the developed scale, an exploratory factor analysis (EFA) was conducted, guided by the 5-step process outlined in the framework by Williams et al. (2010). EFA is a statistical technique used to identify the underlying relationships between measured variables and to uncover the latent structure (factors) of a set of observed variables (Fabrigar and Wegener, 2012). This process helps in determining the number of factors and the loading of each variable on the factors, ensuring that the scale accurately measures the intended constructs. The 5-step process involved formulating the objectives of the factor analysis, designing the analysis, testing assumptions, formulating and assessing the factors, and interpreting and refining the factorial model. By following this structured approach, the analysis provided a robust evaluation of the scale's construct validity, ensuring that it effectively captures the underlying dimensions of the research topic. For the analysis technique, a principal component analysis with varimax rotation was employed, and the number of factors was determined based on eigenvalues of 1 or more.

### 2.2.4. Criterion validity

To assess criterion validity, concurrent validity was examined using three established self-report scales: the Perceived Stress Scale (PSS), the Inventory of New College Student Adjustment (INCA), and a two-item measure for dropout intention. Correlations between scores on the developed scale and scores on these criterion measures were computed. High correlations with the PSS and INCA scales would indicate that the developed scale accurately measures stress levels and adjustment difficulties among new college students, respectively. Similarly, a significant correlation with the dropout intention measure would suggest that the developed scale effectively predicts students' intentions to dropout.

### 2.2.5. Reliability

Two measures were employed to assess the reliability of the scale: inter-item/inter-total correlation and Cronbach's  $\alpha$ . Cronbach's  $\alpha$ , a widely used measure ranging from 0 to 1, was employed to assess the internal consistency of the scale items (Bonett and Wright, 2015).

Higher Cronbach's  $\alpha$  scores ( $>0.70$ ) indicated sufficient reliability, suggesting that the items consistently measured the intended construct. In addition, the inter-item/inter-total correlation, calculated using Pearson's  $r$  coefficient, provided insights into item redundancy within the scale. The optimal range for inter-item correlation varies across studies; some suggest it should fall between 0.20 and 0.40 (Piedmont and Hyland, 1993), while others propose it should not exceed 0.70 and should not be lower than 0.30 (Boateng et al., 2018). In this study, the cut off score for inter-item/inter-total correlation was set from 0.20 to 0.70. This range was chosen to ensure an appropriate level of item coherence while avoiding excessive redundancy or duplication.

### 2.3. Participants

This study included a sample of 303 junior and senior student nurses from three nursing schools in the Philippines. The sample size was determined based on the initial pool of 30 items generated through inductive and deductive methods. As a rule of thumb, there should have been at least 10 respondents for each item of the scale (DeVellis and Thorpe, 2021). Participants were selected regardless of gender and were currently enrolled in nursing programs at the universities during the study period. Freshman and sophomore students without clinical experience were excluded from the study to focus on students with practical exposure in clinical settings. Initially, 400 students were invited to participate, resulting in a response rate of approximately 76 %.

### 2.4. Instrumentations

Three self-report scales were used including the Perceived Stress Scale (PSS), the Inventory of New College Student Adjustment (INCA), and a two-item measure for dropout intention.

To measure psychological stress in student nurses, the Perceived Stress Scale (PSS) developed by Cohen et al. (1994) was employed. The PSS comprised 4 items and examined life stress on a five-point Likert scale, which ranged from “never” to “often.” Sample items included questions like “In the last month, how often did you feel that you were unable to control the important things in your life?” and “In the last month, how often did you feel confident about your ability to handle your personal problems?”. The PSS was found to be valid and reliable with an internal consistency value of 0.87.

The Inventory of New College Student Adjustment (INCA), developed by Watson and Lenz in 2018, was a 14-item scale used to evaluate student nurses' adjustment to college life. This scale included two sub-scales: Belief in Self (8 items) and Supportive Network (6 items). Participants rated their agreement level with each statement on a 4-point scale, ranging from strongly disagree (1) to strongly agree (5). Higher scores on the INCA indicated better academic adjustment. This scale was found to have excellent reliability with a Cronbach's alpha of 0.92 (Watson and Lenz, 2020).

For assessing the intention to drop out, a two-item ad hoc scale was used. Students responded on a 5-point Likert-type scale, which ranged from “strongly disagree” (1) to “strongly agree” (5). The two items were: “Given the difficulties in reconciling my work or personal life with my studies, I thought of abandoning them” and “Given the difficulties in my studies, I thought of abandoning them.” The scale showed high internal consistency, with a Cronbach's alpha of 0.91 (Labrague, 2023).

2.5. Data collection

Eligible students who provided informed consent were invited to participate in the study. The research utilized a combination of qualitative and quantitative methods, beginning with qualitative interviews to explore nuanced experiences and perceptions related to the research topic. Subsequently, quantitative data were gathered using established scales and measures to assess various constructs related to student adaptation and well-being in the academic environment. All data collection procedures were conducted in accordance with the approved protocol and ethical guidelines, ensuring rigor and integrity in gathering data relevant to the study objectives. Data collection took place between September 2023 and January 2024.

2.6. Ethical considerations

Before commencing data collection, the research protocol underwent rigorous ethical review and received clearance from the Institutional Review Board of [redacted for review purposes], ensuring compliance with ethical guidelines. Following ethical clearance, the researcher communicated with the presidents and deans of the College of Nursing to obtain institutional support and ensure alignment with college policies and procedures. Informed written consent was obtained from all eligible students prior to data collection, emphasizing their voluntary and informed participation. Students were provided with comprehensive information about the research objectives, potential risks, benefits, and procedures involved. They were also assured that their decision to participate or withdraw would not impact their academic standing. Participants were encouraged to seek clarification and ask questions before consenting to participate.

2.7. Data analysis

Data collected was analyzed using the Statistical Package for the Social Sciences version 29 software program (IBM Corp.). The construct validity of the developed scale was assessed using exploratory factor analysis (EFA) via principal component analysis with varimax rotation, determining factors based on eigenvalues of 1 or more. The suitability of the data for exploratory factor analysis (EFA) was determined based on the criteria that the Kaiser–Meyer–Olkin (KMO) value should be higher than 0.7, and the p-value of Bartlett’s test of sphericity should be lower than 0.05. Factors were extracted using principal component analysis (PCA), and varimax rotation was applied. The following criteria were used for removing poorly performing items: (1) Factor loadings lower than 0.33, (2) Loading differences between two factors lower than 0.2, and (3) Communalities lower than 0.3 (Williams et al., 2010). The internal consistency of both the entire scale and its subscales was assessed using inter-item/inter-total correlations and Cronbach’s  $\alpha$ . Additionally, criterion validity was examined using Pearson’s correlation coefficient, comparing the scores of the developed scale with those of established measures such as the Perceived Stress Scale (PSS), the Inventory of New College Student Adjustment (INCA), and the one-item measure for dropout intention.

3. Results

3.1. Characteristics of participants

During a 3-month data-collection period, 303 student nurses were recruited to participate in the study. The mean age of the students was 21.12 years, with a standard deviation of 0.98 years. 18.2 % of the participants were male, while 81.8 % were female. Regarding academic progression, the majority (64.4 %) are in their third year of education, with the remaining 35.6 % were in their fourth year. Analysis of residential accommodation reveals that 75.9 % of the student nurses reside with their families, while 9.2 % live on-campus and 14.9 % off-campus.

Participation in extracurricular activities was noted in 29.0 % of the cohort, while 71.0 % were not engaged in any extracurricular activities (Table 2).

3.2. Content and face validity

The Content Validity Index (CVI) scores for the CAS-SN items varied between 0.89 and 1. Following Yusoff’s (2019) recommended threshold of >0.70 for item relevance, 3 items were eliminated, resulting in a final set of 27 items. The overall CVI score reached 0.955, indicating strong content validity. Additionally, based on feedback from experts, two items were revised to improve clarity. Following the outcomes of the field pretesting, adjustments were made to improve clarity. Following face validity, three items were deleted from the scale, resulting in a total of 24 items. These items were removed based on the comments and responses of the sampled nurses, as they were perceived as unclear, irrelevant, or redundant. This process enhanced the overall clarity and appropriateness of the scale for its intended users.

3.3. Inter-to-item and inter-to-total correlations

After conducting inter-total correlations, three items were removed from the scale. The corrected item-to-total correlations fell within an acceptable range, ranging from 0.21 to 0.65 (Boateng et al., 2018; Piedmont and Hyland, 1993). Additionally, correlations between items ranged from 0.257 to 0.731, while corrected item-to-item correlations ranged from 0.47 to 0.66. Consequently, three items were eliminated at this stage, resulting in a reduction of the total number of items to 18.

3.4. Construct validity

Exploratory Factor Analysis (EFA) was employed to identify the underlying factors within the remaining 18 items of the scale. The initial analysis revealed a Kaiser–Meyer–Olkin (KMO) value of 0.919 ( $p < .001$ ), surpassing the desired threshold of 0.5 and indicating the suitability of the scale’s items for factor analysis. Furthermore, Bartlett’s test of sphericity confirmed the factorability of the 15 items ( $\chi^2 = 2533.212$ ,  $df = 105$ ,  $p < .001$ ). The communalities ranged from moderately adequate (0.51) to highly adequate (0.87). Determination of the number of factors to extract was guided by eigenvalues of 1 and above, as well as scree plot outcomes. As shown in Fig. 1 and Table 3, three factors emerged, explaining 65.92 % of the variance. Following the removal of three items with coefficients below 0.50, the final scale consisted of 15 items. Factor 1 comprised 6 items, Factor 2 included 6 items, and Factors 3 contained three items, totaling 15 items.

Table 2  
Student nurses’ characteristics ( $n = 303$ ).

Characteristics	Categories	Mean	SD
Age		21.115	0.984
Characteristics	Categories	N	%
Gender	Male	55	18.2
	Female	248	81.8
Year level	3rd year	195	64.4
	4th year	108	35.6
Residential accommodation	On-campus	28	9.2
	Off-campus	45	14.9
	With family	230	75.9
Involvement in extracurricular activity	No	215	71.0
	Yes	88	29.0
Academic performance	Poor	3	1.0
	Below average	11	3.6
	Average	146	48.2
	Above average	132	43.6
	Excellent	11	3.6



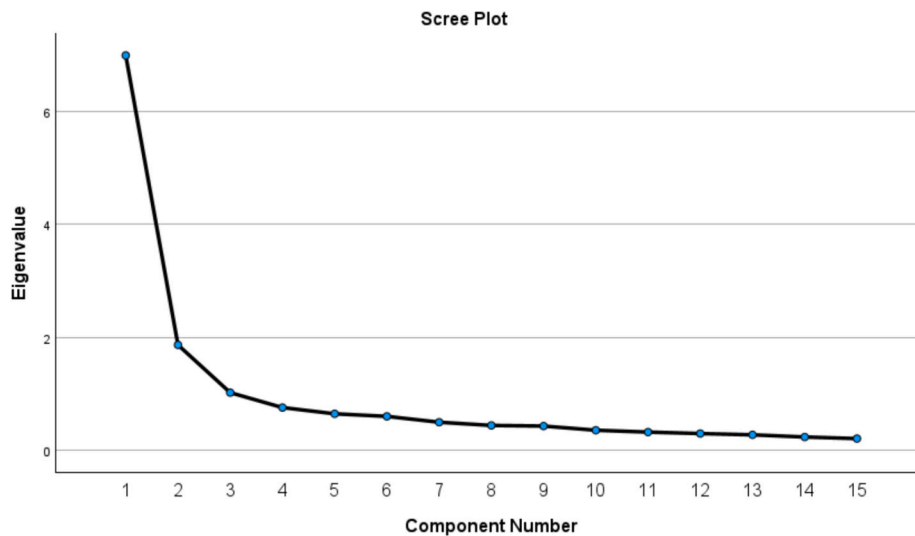


Fig. 1. Scree plot.

### 3.5. Criterion validity

Table 4 presents the correlations between the means of the three factors of the CAS-SN and three measures: the Intention to Dropout Scale, the Perceived Stress Scale, and the Inventory of New College Student Adjustment. These correlations were performed to establish the criterion validity of the scale. Means in all three factors significantly correlated with the means in the Inventory of New College Student Adjustment (all  $p < .001$ ). Additionally, means in Factors 2 and 3 demonstrated significant negative correlations with the means in the Perceived Stress Scale (all  $p < .001$ ) and the Intention to Dropout Scale (all  $p < .001$ ). The overall mean value of the CAS-SN demonstrated significant correlations with all three variables, further supporting the criterion validity of the scale.

### 3.6. Reliability

Before conducting the factor analysis, the scale exhibited a Cronbach's  $\alpha$  value of 0.933, indicating excellent reliability. After the factor analysis, the total Cronbach's  $\alpha$  value remained high at 0.913. The individual Cronbach's  $\alpha$  values for the three factors were as follows: Factor 1, 0.876; Factor 2, 0.895; and Factor 3, 0.786 (Table 5).

## 4. Discussion

This paper describes the development and psychometric testing of a newly developed scale to comprehensively assess adjustment in clinical settings among student nurses. The CAS-SN may significantly contribute to prior knowledge by introducing a structured and validated tool that captures dimensions of clinical adjustment not adequately assessed by previous scales (e.g., CCSAS, SACQ, CLAS, ACLS). By offering comprehensive insights into students' adaptation to clinical environments, the CAS-SN enables nurse educators to systematically evaluate both facilitators and barriers to clinical adaptation. This structured assessment may empower nurse educators to tailor support strategies that enhance students' clinical learning experiences, thereby better preparing them for professional practice.

The reliability analysis of the CAS-SN revealed excellent internal consistency, as evidenced by high Cronbach's  $\alpha$  values across all factors, indicating that the scale consistently measures the intended construct. This excellent reliability underscores the validity of the CAS-SN as a comprehensive tool for assessing student nurses' clinical adjustment. When assessing the validity of the scale, the CVI scores, which ranged between 0.89 and 1, fell within the acceptable level (Yusoff, 2019).

Criterion validity assessments further supported the CAS-SN's validity, with significant correlations observed between the scale factors and established measures of academic adjustment, psychological distress, and dropout intention. These results align with existing literature on the relationships between clinical adjustment and various student outcomes (Panda et al., 2021; Pienaar et al., 2022). The EFA revealed a final scale consisting of 15 items and three distinct factors, each representing critical dimensions of clinical adjustment: Clinical Adaptability and Competence, Professional Responsibility and Interpersonal Dynamics, and Resilience and Self-care Strategies. These factors collectively explained 65.92 % of the variance in CAS-SN, which is considered sufficient (Fabrigar and Wegener, 2012).

Factor 1, which was labeled as 'Professional Growth and Interpersonal Engagement,' mirrors student nurses' understanding of their professional roles and responsibilities, as well as their interpersonal skills and interactions within the healthcare team. It includes attributes such as professionalism, ethical decision-making, effective communication with patients and colleagues, and collaborative teamwork. This dimension is consistent with previous studies (Armstrong, 2023; Alkhaqani, 2022), which emphasized the importance of effective communication and teamwork skills for nursing students in clinical settings. Moreover, numerous works have demonstrated how positive interactions with healthcare teams during clinical rotations contribute to students' professional identity development, further supporting the relevance of this factor in clinical adjustment (Lee et al., 2023; Hampton et al., 2020).

Factor 2, which was labeled as 'Clinical Competence and Confidence,' captures student nurses' ability to adapt to the dynamic and fast-paced clinical environment while demonstrating proficiency in clinical tasks and skills. It encompasses aspects such as nursing knowledge application, technical competence, and the ability to learn and adjust quickly to new clinical settings. This dimension aligns with previous research by Al Mekkawi and El Khalil (2020), which emphasized the importance of clinical education in achieving clinical competence. Additionally, the study of Woo and Newman (2020) highlighted how hands-on experiences in clinical settings foster the development of critical thinking and problem-solving abilities among nursing students, further supporting the significance of this factor in clinical adjustment.

Finally, Factor 3, which was labeled as 'Coping and Support Strategies,' encompasses student nurses' ability to cope with stress, adversity, and emotional challenges faced in the clinical setting, as well as their engagement in self-care practices to maintain their health well-being. It includes aspects such as stress management, coping mechanisms, self-awareness, and self-care behaviors. This dimension resonates with the

**Table 3**  
Factor loading of the clinical adjustment scale items.

CAS items	Factors			Cronbach's $\alpha$ if item deleted
	1	2	3	
Factor 1: Professional Growth and Interpersonal Engagement				
1. I understand and adhere to the ethical principles and professional conduct expected of a student nurse.	<b>0.853</b>	0.136	0.175	0.909
2. I embrace my role as a student nurse during clinical rotations and take my responsibilities seriously.	<b>0.846</b>	0.139	0.221	0.907
3. I am motivated to continually improve and grow as a future healthcare professional.	<b>0.800</b>	0.161	0.161	0.906
4. I demonstrate empathy and respect when interacting with diverse patient populations.	<b>0.784</b>	0.183	0.140	0.905
5. I adjust my clinical skills based on feedback and guidance from clinical instructors.	<b>0.624</b>	0.436	0.101	0.907
6. I form positive working relationships with my clinical colleagues and peers.	<b>0.607</b>	0.480	0.101	0.906
Factor 2: Clinical Competence and Confidence				
7. I feel competent in performing basic clinical procedures and patient assessments.	0.229	<b>0.770</b>	0.079	0.905
8. I am at ease working with the clinical staff and interacting with patients.	0.175	<b>0.739</b>	0.247	0.906
9. I feel comfortable and confident in navigating the clinical setting and locating necessary resources.	0.080	<b>0.736</b>	0.237	0.908
10. I communicate effectively with patients, families, and healthcare team members during clinical practice.	0.445	<b>0.703</b>	0.011	0.908
11. I adapt well to the physical layout and workflow of the clinical unit.	0.112	<b>0.699</b>	0.392	0.913
12. I am able to apply theoretical knowledge to practical situations during clinical rotations.	0.263	<b>0.663</b>	0.312	0.912
Factor 3: Coping and Support Strategies				
13. I seek support from clinical instructors or peers when feeling overwhelmed.	0.089	0.284	<b>0.790</b>	0.907
14. I use relaxation techniques to cope with the demands of the clinical environment.	0.354	0.100	<b>0.686</b>	0.907
15. I effectively manage stress and emotions during challenging clinical situations.	0.192	0.430	<b>0.618</b>	0.908
Eigenvalues	6.994	1.870	1.025	
Explained variance (%)	46.626	12.465	6.834	
Cumulative variance (%)	46.626	59.091	65.925	

findings of Kaihlanen et al. (2020), who highlighted the emotional challenges faced by nursing students during clinical placements and emphasized the importance of resilience in navigating these experiences. Additionally, the study of Ching et al. (2020) underscored the significance of self-care strategies in mitigating burnout and promoting well-being among healthcare professionals, further supporting the relevance of this factor in clinical adjustment.

Collectively, these three factors represent critical dimensions of

**Table 4**  
Correlations between CAS-SN Subscales, Intention to Dropout, Perceived Stress Scale, and the Inventory of New College Student Adjustment.

Variables	Inventory of New College Student Adjustment	Perceived Stress Scale	Intention to dropout
Factor 1: Professional Growth and Interpersonal Engagement	0.846**	-0.179**	-0.278*
Factor 2: Clinical Competence and Confidence	0.509**	-0.190**	-0.189**
Factor 3: Coping and Support Strategies	0.779**	-0.159**	-0.159**
Clinical Adjustment Scale (Student Nurse Version)	0.553**	-0.189**	-0.252**

\*\*  $p < 0.01$

\*  $p < 0.05$

**Table 5**  
Mean, SD, and Cronbach's Alpha of the Scale and Factors.

Variables	Mean	SD	Cronbach's Alpha
Factor 1: Professional Growth and Interpersonal Engagement	4.476	0.559	0.876
Factor 2: Clinical Competence and Confidence	3.792	0.626	0.895
Factor 3: Coping and Support Strategies	3.902	0.731	0.786
Clinical Adjustment Scale (Student Nurse Version)	4.087	0.527	0.913

clinical adjustment among student nurses, capturing their ability to adapt, perform effectively, and thrive in the clinical learning environment. During the COVID-19 pandemic, these factors have gained heightened significance. Nursing students have faced unprecedented challenges, such as adapting to rapidly changing healthcare protocols, managing increased patient loads, and coping with heightened emotional stress (Labrague, 2023; Yazici and Ökten, 2022). Factor 1, focusing on professionalism, communication, and interpersonal skills, became essential for maintaining patient care standards amidst logistical and safety challenges. Factor 2, centered on clinical competence and adaptability, played a crucial role in ensuring students could quickly learn and apply new skills required in pandemic conditions, such as the COVID-19 pandemic. Factor 3, addressing coping mechanisms and self-care, became vital for managing the emotional toll of caring for COVID-19 patients and navigating the uncertainties of the healthcare environment. Understanding and supporting these factors are therefore pivotal in preparing nursing students to effectively contribute to patient care and maintain their well-being during global health crises like the COVID-19 pandemic.

Although Confirmatory Factor Analysis (CFA) is typically conducted after Exploratory Factor Analysis (EFA), it was not performed in this study for several reasons. Firstly, logistical constraints limited the availability of student nurses in the region, resulting in a sample size insufficient for robust CFA procedures. Secondly, the primary aim of the study was exploratory, focusing on initial factor identification rather than the confirmation of a predetermined factor structure. Lastly, conducting CFA without prior exploratory analysis could have compromised the validity and interpretability of the results (Kyriazos, 2018; Schmitt, 2011).

Overall, the findings underscore the relevance of the CAS-SN in assessing critical aspects of student nurses' adjustment in clinical settings and its potential implications for their academic success and well-being. Moving forward, future research could explore longitudinal outcomes of students assessed using the CAS-SN, examining how changes in clinical adjustment influence academic performance, career

satisfaction, and retention rates. Cultural nuances may influence how students perceive and respond to items related to professional roles, interpersonal dynamics, clinical competence, and coping strategies within clinical settings (Labrague et al., 2018). Therefore, future studies should consider cultural validation of the CAS-SN to ensure its applicability and reliability across diverse cultural contexts, thereby enhancing its utility in nursing education and practice globally.

#### 4.1. Limitation

This study has a few limitations that warrant consideration. First, the sample was drawn only from three nursing schools in the Philippines, limiting the generalizability of the findings to other contexts or populations. Future research should aim to replicate the study with larger and more diverse samples to enhance the external validity of the CAS-SN. Next, while efforts were made to ensure the content validity of the scale through expert review and field pretesting, the possibility of response bias or social desirability cannot be entirely ruled out. Future studies could employ alternative methods, such as cognitive interviewing, to further validate the scale items and enhance its robustness.

#### 4.2. Implications for nurse education

The findings of this study highlight significant implications for nursing education, practice, and research, particularly with regard to the CAS-SN's role as a critical assessment tool. The CAS-SN enables nurse educators and clinical instructors to reliably assess and monitor students' clinical adjustment and to enhance learning experiences and promote successful integration into clinical environments (Sparacino, 2016). Healthcare institutions can utilize the CAS-SN to evaluate the effectiveness of clinical placement programs, identifying areas for improvement within the learning environment to better align with students' needs and professional requirements. Moreover, during new nurse orientation, the CAS-SN provides valuable insights into initial clinical adaptation, guiding personalized support and training efforts to bolster nurses' confidence and competence in patient care from the outset of their careers. Finally, the CAS-SN lays a foundation for future research on clinical adjustment among student nurses, offering a standardized framework to explore factors influencing clinical readiness and professional development, thereby advancing evidence-based practices in nursing education.

### 5. Conclusion

The CAS-SN offers a comprehensive and reliable tool for assessing student nurses' adaptation to clinical settings, with promising reliability and validity results. By identifying students' clinical adjustment levels and associated factors, the CAS-SN can inform targeted interventions and support systems to promote successful clinical adaptation and enhance overall student outcomes. Specifically, the CAS-SN can be utilized to identify nursing students who may be struggling with clinical practice, allowing educators and administrators to provide timely and targeted support such as mentoring, counseling, or additional training. The scale can also be used to evaluate the effectiveness of various educational programs and interventions aimed at improving clinical adaptation. Moving forward, further research is needed to validate the scale in diverse populations and explore its potential applications in nursing education and practice, including its use in longitudinal studies to track students' progress over time and its integration into nursing curricula to enhance the clinical training experience. Importantly, the insights gained from the CAS-SN can help adapt nursing education and training to better prepare students for future healthcare challenges, such as those exacerbated by the COVID-19 pandemic.

### Ethical clearance

The ethical clearance was provided by the Office of the Institutional Human Research Ethics Committee (Samar State University) (IHREC-Code: 0023-0033).

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### CRedit authorship contribution statement

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### Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used the ChatGPT in order to improve readability and language of the paper. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

### Declaration of competing interest

The author declares no conflict of interest.

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