

Margins of Competence: Quantitative Assessment of Common Self-Perceived Clinical Errors Among 4th Year Nursing Students

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Abstract

This study assessed common self-perceived clinical errors among fourth-year nursing students by examining their adherence to patient-safety practices involving fall prevention, blood and blood product transfusion, patient transfer, medication administration, communication, infection control, and nursing care. A quantitative approach using descriptive-evaluative, descriptive-comparative, and descriptive-correlational designs was employed among 309 fourth-year nursing students selected through purposive sampling. Data were collected using the 36-item Medical Error Scale for Nursing Students and analyzed using frequency and percentage distributions, weighted means, Mann–Whitney U test, Kruskal–Wallis test, and Spearman’s correlation. Results showed high self-perceived adherence to patient-safety practices, with an overall MES mean of 4.65, interpreted as “Always.” Infection Control obtained the highest mean ($M = 4.76$), whereas Fall Prevention obtained the lowest ($M = 4.50$), although both remained within the “Always” interpretation. Significant gender differences were identified in blood and blood product transfusion, patient transfer, communication, infection control, and the overall MES assessment, while significant age differences were found in fall prevention and the overall assessment. Ten of the 21 pairs of MES dimensions demonstrated significant relationships, indicating that selected areas of self-perceived patient-safety competence were interconnected. The study recommends strengthening fall-prevention education through hands-on simulation, clinical supervision, feedback, reflective practice, open communication, and integrated patient-safety learning activities. The study supports SDG 3 (Good Health and Well-Being) through its emphasis on patient safety and prevention of avoidable harm and SDG 4 (Quality Education) through the continued development of nursing education and clinical competence. Its sustainability impact lies in supporting public health, educational, and institutional sustainability by strengthening patient-safety preparation and promoting safer and more responsible future nursing practice.

Keywords: Clinical Errors; Infection Control; Medical Error Scale; Nursing Students; Patient Safety; Self-Perceived Competence; Sustainable Development Goals

1. Introduction

Patient safety is a fundamental component of nursing practice, requiring nurses to integrate theoretical knowledge, clinical skills, professional judgment, and adherence to established safety practices. Nursing students develop these competencies through clinical training, where they apply classroom learning to actual patient-care situations. According to Rivera et al. (2022), applying theoretical knowledge promotes the development of students' knowledge, clinical skills, and professional attitudes. Despite this preparation, nursing students may still experience or perceive errors while performing clinical responsibilities, particularly as they assume increasingly complex tasks during their training. Clinical errors among nursing students may involve procedural, medication-related, communication, infection-control, and patient-care practices. These concerns are particularly important among fourth-year nursing students who have accumulated clinical exposure and are approaching professional practice. Examining students' perceptions of their performance across critical areas of patient safety may therefore provide insight into areas of competence and practices that require further educational attention. Accordingly, this study assesses common self-perceived clinical errors among fourth-year nursing students across patient falls, blood and blood product transfusion, patient transfers, medication administration, communication, infection control, and nursing care practices.

Nursing professionals serve as frontline healthcare providers responsible for promoting patient safety and preventing avoidable harm. In the Philippines, nursing students undergo clinical training to translate theoretical knowledge into practice. According to Rivera et al. (2022), clinical application contributes to the development of knowledge, clinical skills, and professional attitudes. However, theoretical preparation alone does not eliminate the possibility of errors when students participate in patient management within actual clinical environments. Nursing students may encounter both procedural and reasoning-related difficulties during clinical practice. Reported concerns range from inadequate hand hygiene and erroneous injection techniques (Mohsenpour et al., 2024) to medication miscalculations (Lee & Wessol, 2021). Such errors are relevant to patient safety because nursing students participate in clinical activities requiring accurate judgment, adherence to procedures, effective communication, and consistent application of safety standards. Assessing how fourth-year nursing students perceive their performance in these areas can help identify aspects of clinical practice that may require continued attention as students transition toward professional nursing roles.

Clinical errors among nursing students can occur across multiple aspects of patient care. García-Gómez et al. (2020) reported that nursing students are highly susceptible to committing errors during their clinical practice as they showed that over 1,600 out of 4284 undergraduate nursing students in Spain reported clinical errors during their clinical placements. These findings demonstrate that clinical errors are not confined to a single nursing procedure but may emerge across the range of responsibilities encountered during clinical education. For the present study, patient-safety practices are examined through seven clinical dimensions: patient falls, blood and blood product transfusion, patient transfers, medication administration, communication, infection control, and nursing care practices. Together, these areas represent important aspects of students' clinical responsibilities and provide a structured basis for assessing their self-perceived adherence to patient-safety practices. Examining these dimensions also allows potential areas of lower perceived competence to be identified rather than treating clinical error as a single, undifferentiated construct.

Clinical errors among nursing students have been documented internationally, demonstrating the importance of patient-safety preparation during undergraduate nursing education. García-Gómez et al. (2020) documented clinical errors among undergraduate nursing students during clinical placements in Spain, illustrating that students may encounter patient-safety challenges even while completing supervised professional preparation. An important concern is that available estimates may not fully represent students' experiences. Because these observations are based on students' self-reports rather than formal incident documentation, the actual prevalence of errors may be underestimated (Heydarikhayat et al., 2024). Reliance on formal incident reports may similarly provide an incomplete understanding when students are reluctant to disclose errors. This concern is also evident in the Philippine context. Among the 386 nursing students included in the local study by Baltazar et al. (2026), 74.09% reported incidents of clinical errors, while 25.91% did not report them due to fear of being blamed, punished, or judged. The most common clinical errors involved non-compliance with the 10 rights of drug administration, with underinfusion at 14.44%, overinfusion at 10.75%, and breaches in sterility at 5.88%. These findings demonstrate the relevance of examining students' own perceptions of clinical practices while recognizing that underreporting may affect the documented occurrence of clinical errors.

The study conceptualizes self-perceived clinical errors through students' assessment of their adherence to patient-safety practices across seven interconnected areas of clinical performance: patient falls, blood and blood product transfusion, patient transfers, medication administration, communication, infection control, and nursing care practices. These dimensions provide the basis for examining how students perceive their competence and safety-related behaviors during clinical duties. Within this framework, self-perceived competence does not necessarily represent objectively documented clinical performance. Instead, it reflects students' evaluation of their own

adherence to practices intended to reduce clinical errors and protect patients. The assessment therefore provides a structured representation of students' perceived strengths and areas requiring further development across different patient-safety responsibilities.

Despite evidence that nursing students encounter clinical errors during clinical placements, a gap remains in understanding the specific types of errors and safety practices that students themselves perceive during clinical practice. Existing incident documentation may provide an incomplete picture because some errors remain unreported. Because these observations are based on students' self-reports rather than formal incident documentation, the actual prevalence of errors may be underestimated (Heydarikhayat et al., 2024). This gap is particularly relevant in the Philippines, where localized evidence remains limited. Baltazar et al. (2026) demonstrated that some nursing students did not report clinical incidents because of concerns about blame, punishment, or judgment. Consequently, examining self-perceived clinical errors offers an additional perspective for understanding how graduating nursing students evaluate their adherence to patient-safety practices. To address this gap, the present study aims to identify common self-perceived clinical errors among fourth-year nursing students during hospital duties in the general ward, specifically in patient falls, blood and blood product transfusion, patient transfers, medication administration, communication, infection control, and nursing care practices. It also examines differences in these assessments according to demographic characteristics and relationships among the clinical dimensions. Understanding these perceptions may provide evidence for strengthening clinical education, supervision, reflective practice, and patient-safety preparation among nursing students.

The study is relevant to Sustainable Development Goal 3 – Good Health and Well-Being through its focus on patient safety and clinical practices intended to minimize preventable harm. Assessing self-perceived clinical errors in areas such as medication administration, infection control, patient falls, blood transfusion, communication, patient transfer, and nursing care can identify aspects of clinical preparation that require continued attention to support safer healthcare practices. The research is also aligned with Sustainable Development Goal 4 – Quality Education because clinical education is central to preparing nursing students for professional practice. Identifying areas in which fourth-year nursing students perceive stronger or weaker adherence to patient-safety practices can inform educational strategies, clinical supervision, and learning experiences designed to strengthen the transition from theoretical preparation to competent clinical practice.

The study contributes primarily to public health, educational, and institutional sustainability by examining how nursing students perceive their adherence to essential patient-safety practices before entering professional nursing practice. Strengthening competence in patient falls, blood and blood product transfusion, patient transfers, medication administration, communication, infection control, and nursing care practices can support the continued preparation of nurses capable of delivering safe and responsible patient care. From an educational perspective, identifying areas requiring further development can help nursing programs and clinical instructors refine training, supervision, and reflective learning. From a public health perspective, sustained attention to patient-safety competencies can support efforts to reduce preventable harm and reinforce safe clinical practices. Institutionally, understanding students' self-perceived clinical performance can provide evidence for strengthening patient-safety education and promoting a learning environment in which clinical experiences are used to develop competence, professional self-awareness, and continuous improvement.

2. Material and methods

2.1 Research Design

The study employed a quantitative approach using descriptive-evaluative, descriptive-comparative, and descriptive-correlational designs. The descriptive-evaluative design was used to identify common clinical errors perceived by nursing students. The descriptive-comparative design examined differences in Medical Error Scale assessments when respondents were grouped according to their demographic profiles, while the descriptive-correlational design determined significant relationships among the medical error dimensions.

2.2 Locale of the Study

The study was conducted at a private institution of higher education in Metro Manila known for its medical and allied health programs, particularly nursing. The institution provides nursing students with theoretical instruction and hands-on clinical experiences, making it an appropriate setting for examining their experiences and self-perceived clinical errors during clinical practice.

2.3 Respondents of the Study

The respondents were fourth-year nursing students with previous hands-on experience in hospital settings. Their clinical exposure enabled them to provide information regarding patient-safety practices and issues encountered during clinical practice. Eligible respondents were 18 to 59 years old, currently enrolled in the nursing program,

in their fourth year of study, had previous clinical experience in a general ward, and voluntarily agreed to participate in the research.

2.4 Sample and Sampling Procedure

The study included 309 respondents selected through purposive sampling. Participants were chosen based on the established inclusion criteria to ensure that respondents had the educational level and clinical experience necessary to provide information relevant to the study.

2.5 Research Instrument

Data were collected using a survey questionnaire consisting of two parts. The first part obtained the respondents' demographic information, specifically gender and age. The second part utilized the adopted "Medical Error Scale (MES) for Nursing Students," developed by Havva Öztürk and İlknur Kahrman. The instrument contained 36 items rated using a five-point Likert scale, with responses ranging from 5 = Always to 1 = Never. It assessed patient-safety practices involving patient falls, blood and blood product transfusion, patient transfers, medication administration, communication, infection control, and care practices. The validity and reliability of the Medical Error Scale were established in the original study involving 662 student nurses from two universities in Turkey. The instrument obtained a Content Validity Index (CVI) of 0.82, a Cronbach's alpha coefficient of 0.94, a Spearman-Brown coefficient of 0.93, and a Guttman coefficient of 0.92, indicating high internal consistency. Item-total correlations ranged from 0.36 to 0.68. Confirmatory factor analysis reported a degree of freedom of 3.01, RMSEA = 0.555, CFI = 0.97, NNFI = 0.97, and NFI = 0.96, supporting the validity and reliability of the instrument for assessing medical errors among student nurses during clinical practice.

2.6 Data Gathering Procedure

Prior to data collection, the study obtained ethical approval from the Institutional Ethics Review Committee (IERC) under reference number 2026-IERC-00044. Permission to conduct the study was also secured from the Dean of the College of Nursing. Participants were recruited on-site according to the established eligibility criteria and were provided with informed consent containing information about the research objectives, methodology, and participant rights. Signed informed consent was obtained before the questionnaires were administered. After completion, the questionnaires were collected and the responses were encoded for analysis. Digital data were stored in a password-protected file accessible exclusively to the researchers to maintain the security and confidentiality of the collected information.

2.7 Data Analysis Techniques

Frequency and percentage distributions were used to describe the respondents' demographic profiles, while weighted means were used to assess each Medical Error Scale dimension. For the five-point Likert scale, mean scores of 4.21–5.00 were interpreted as "Always," indicating that students perceived themselves as consistently adhering to patient-safety practices. Scores of 3.41–4.20 were interpreted as "Often," 2.61–3.40 as "Sometimes," 1.81–2.60 as "Rarely," and 1.00–1.80 as "Never." Non-parametric statistical tests were employed based on the distribution of the data. The Mann-Whitney U Test was used to determine significant differences in Medical Error Scale assessments according to gender, while the Kruskal-Wallis Test was used to determine significant differences according to age. Spearman's correlation was used to determine significant relationships among the Medical Error Scale dimensions.

2.8 Ethical Considerations

The study adhered to the principles of voluntary participation, privacy, and confidentiality. Participants were informed that participation was voluntary and that they could withdraw without penalty before submitting the survey. Because the completed survey forms contained no identifying information, withdrawal was no longer possible after submission. Physical survey forms were securely maintained by the Principal Investigator, while digital data were stored in an encrypted file. All collected records were to be securely archived for five years in accordance with institutional guidelines, after which both physical and digital records would be destroyed.

3. Results and Discussion

3.1 Self-Perceived Patient-Safety Practices Among Fourth-Year Nursing Students

The respondents were predominantly female (70.6%), while 29.4% were male, and the largest age group consisted of 22-year-old students (47.9%). Overall, fourth-year nursing students reported high self-perceived adherence to patient-safety practices, with an overall MES mean of 4.65, interpreted as "Always." Infection Control obtained the highest mean ($M = 4.76$, $SD = 0.300$), followed by Care Practice ($M = 4.72$), Medication Administration ($M = 4.69$), Communication ($M = 4.68$), Blood and Blood Product Transfusion ($M = 4.67$), and Patient Transfer ($M = 4.67$). Fall received the lowest mean ($M = 4.50$, $SD = 0.286$), although it remained within the "Always" interpretation. These findings indicate that the students generally perceived themselves as consistently adhering to clinical safety standards. The higher ratings for Infection Control, Care Practice, Medication Administration, and Communication may reflect the regular emphasis placed on these competencies during nursing education and

clinical exposure. In contrast, the comparatively lower rating for Fall suggests that fall-prevention practices may be less consistently integrated into students' clinical routines despite their overall high self-perceived adherence to patient safety.

3.1.1 Fall Prevention Practices

All Fall indicators were interpreted as "Always." The lowest-rated indicator was removing unused materials from the patient's room ($M = 4.36$), while locking beds and wheelchairs when not in use received the highest mean ($M = 4.64$). Although students perceived themselves as consistently adhering to fall-prevention measures, environmental safety practices involving unused materials received comparatively lower ratings. The lower assessment of removing unused materials suggests that environmental modification may receive less attention than other fall-prevention activities. This finding is consistent with the study of Moghli et al. (2024), who reported that environmental modification may be given less attention by student nurses; this may be due to situational confidence and reliance on the patient's family member or watcher.

3.1.2 Blood and Blood Product Transfusion Practices

All Blood and Blood Product Transfusion indicators were rated "Always." The lowest-rated indicator was applying blood and blood products according to the correct technique ($M = 4.56$), while observing patients for possible complications after application received the highest mean ($M = 4.72$). The results indicate high self-perceived adherence overall, although performing the actual transfusion technique received a comparatively lower rating. The lower rating for actual blood administration may reflect students' hesitation and anxiety when performing complex transfusion procedures compared with administrative and verification activities. This finding is consistent with the World Health Organization (WHO, 2021), which emphasizes the importance of correct blood administration practices and adherence to safe clinical transfusion procedures to ensure patient safety and minimize transfusion-related risks.

3.1.3 Patient Transfer Practices

All Patient Transfer indicators were interpreted as "Always." Ensuring transfer according to protocol using a stretcher or wheelchair received the highest mean ($M = 4.72$), while ensuring that the patient was not discharged alone obtained the lowest mean ($M = 4.64$). Overall, the respondents perceived themselves as consistently adhering to safe patient-transfer practices. The comparatively lower rating for ensuring that patients are not discharged alone may reflect students' limited involvement in discharge processes, which are commonly managed by regular healthcare staff. This is consistent with the findings of Moghli et al. (2024), who found that student clinicians had lower ownership of non-clinical, systemic operations such as patient discharge tracking.

3.1.4 Medication Administration Practices

All Medication Administration indicators were interpreted as "Always." Checking medication expiration dates before administration obtained the highest mean ($M = 4.77$). The lowest-rated indicators were giving oral medication or remaining with the patient until it was taken and not leaving medication with the patient for later intake or application, both with a mean of 4.66. These comparatively lower ratings may reflect practical difficulties associated with supervising medication intake while managing multiple responsibilities in clinical settings. This is consistent with the findings of Schroers et al. (2022), which implies that student nurses have documented that interruptions during the administration of medication may extend the length of time required for completion and potentially lead to self-interruptions when completing activities associated with the administration of medications.

3.1.5 Communication and Clinical Documentation Practices

All Communication indicators were rated "Always." Clarifying unclear and potentially problematic orders obtained the highest mean ($M = 4.71$), whereas recording information related to patient treatment in the nurses observation chart obtained the lowest mean ($M = 4.64$). The findings indicate consistently high self-perceived communication practices, although clinical documentation was comparatively lower. The lower assessment of documentation may indicate that students find accurate, appropriate, and complete charting more challenging than other communication activities. This finding is consistent with the study of Bjerkan et al. (2021), where documentation has been the most difficult areas of clinical practice to master by nursing students and practicing health care workers, with limited experience and time limitations are two examples of barriers to providing optimal documentation.

3.1.6 Infection Control Practices

Infection Control obtained the highest overall dimension mean ($M = 4.76$), with all indicators interpreted as "Always." Proper handwashing before and after practice and using materials and products exclusively for each patient obtained the highest means ($M = 4.78$), while proper putting on and taking off of gloves received the lowest mean ($M = 4.74$). Although adherence was high, the comparatively lower rating for proper glove use indicates that some detailed infection-prevention practices may receive less consistent attention. This finding is consistent with the study of Bate (2024), who reported that student nurses had limited awareness of some infection

prevention practices. They also reported a lack of confidence among some students in challenging non-compliance, which resulted in inconsistencies in proper glove use.

3.1.7 Nursing Care Practices

All Care Practice indicators were interpreted as “Always.” Verifying patient identity before performing practices received the highest mean ($M = 4.78$), while checking the local effects of applied care practices obtained the lowest mean ($M = 4.66$). These findings indicate high perceived adherence to nursing care practices but comparatively lower attention to localized effects following interventions. The lower assessment of localized effects may indicate greater difficulty recognizing subtle changes that require careful observation compared with more noticeable systemic effects. This is inline with the suggestion of Byermoen et al. (2022), where Nursing students required continuous practice to develop their assessment skills and distinguish relevant clinical patterns.

3.2 Differences in Medical Error Scale Assessments According to Demographic Characteristics

3.2.1 Differences According to Gender

Significant differences according to gender were identified for Blood and Blood Product Transfusion, Patient Transfer, Communication, and Infection Control ($p = < 0.001$). Fall ($p = 0.164$), Medication Administration ($p = 0.135$), and Care Practice ($p = 0.260$) showed no significant differences. The overall Medical Error Scale assessment showed a statistically significant gender difference ($p = < 0.001$). These findings indicate that self-perceived competence differed according to gender in selected clinical dimensions rather than across all patient-safety practices. Based on the related evidence from Ogunmuyiwa et al. (2025), they found that there are notable gender differences in the clinical competence level of nursing students where female students display a higher competence level than male students.

3.2.2 Differences According to Age

Age-related analysis showed that Fall was the only individual dimension with a statistically significant difference ($p = 0.017$). Blood and Blood Product Transfusion was not significant/borderline ($p = 0.050$), while Patient Transfer ($p = 0.089$), Medication Administration ($p = 0.445$), Communication ($p = 0.348$), Infection Control ($p = 0.351$), and Care Practice ($p = 0.590$) showed no significant differences. The overall Medical Error Scale assessment showed a significant difference according to age ($p = 0.017$). The findings suggest that age was associated with differences in students’ assessments of fall-related practices and overall MES performance, while most individual clinical dimensions did not significantly differ across age groups. The result is consistent with Eskici et al. (2023), who found that nursing students’ perceptions of medical errors differ by age and academic level, particularly in understanding and responding to errors.

3.3 Relationships Among Medical Error Scale Dimensions

Spearman correlation analysis identified statistically significant relationships in 10 of the 21 pairs of MES dimensions. Significant relationships were found between Fall and Medication Administration ($p = 0.015$), Fall and Communication ($p = 0.010$), Fall and Infection Control ($p = 0.003$), Blood Transfusion and Patient Transfer ($p = 0.002$), Blood Transfusion and Communication ($p = 0.008$), Blood Transfusion and Infection Control ($p = 0.003$), Patient Transfer and Medication Administration ($p = 0.016$), Medication Administration and Infection Control ($p = 0.008$), Medication Administration and Care Practice ($p = 0.044$), and Communication and Care Practice ($p = 0.039$). The remaining 11 pairs showed no statistically significant relationships. The significant relationships among selected dimensions may reflect the interconnected nature of patient-safety practices. Communication, for example, is relevant to fall prevention, blood transfusion, and care practice through information exchange, coordination, and monitoring. Medication administration and patient transfer similarly require accurate patient information and communication during transitions of care. These practices share requirements such as adherence to procedures, clinical judgment, communication, supervision, monitoring, and maintenance of a safety-oriented environment. However, because 11 of the 21 pairs were not significantly related, the relationships among the MES dimensions were specific rather than universal. Thus, some areas of students’ self-perceived patient-safety competence were associated with one another, while others functioned relatively independently.

4. Conclusion & Recommendations

The findings indicate that fourth-year nursing students perceived themselves as consistently adhering to patient-safety practices across the Medical Error Scale dimensions. Infection Control demonstrated the highest self-perceived adherence, while Fall Prevention received the lowest rating despite remaining within the “Always” interpretation. Significant differences in selected dimensions and overall Medical Error Scale assessments according to gender and age suggest variations in students’ perceived competence based on demographic characteristics. Significant relationships among selected Medical Error Scale dimensions further indicate that some areas of self-perceived patient-safety competence are interconnected, although these relationships were not observed across all dimensions.

The College of Nursing should strengthen patient-safety education, particularly Fall Prevention, through hands-on simulation, continuous clinical supervision, feedback, and learning opportunities. Nursing students should be encouraged to reflect on their clinical experiences, openly communicate perceived errors with clinical instructors, and seek guidance when performing high-risk clinical tasks. Integrated learning activities should also provide opportunities to apply related patient-safety practices involving blood transfusion, patient transfer, medication administration, communication, infection control, and care practice. Future research should incorporate objective incident reports and formal hospital documentation to complement self-reported data and may use interviews or focus group discussions to further examine factors associated with differences in students' perceptions.

The study was limited to fourth-year nursing students from a private higher education institution in Valenzuela City; therefore, the findings cannot be generalized to all fourth-year nursing students. The assessment relied on students' self-perceptions of their adherence to patient-safety practices, which may be influenced by personal bias and may not reflect actual clinical performance observed directly in practice. Furthermore, the correlational design identifies associations among Medical Error Scale dimensions but does not establish causality; therefore, significant relationships cannot demonstrate that competence or compliance in one clinical area directly causes greater competence in another.

5. Compliance with ethical standards

The authors declare no conflict of interest. The researchers acknowledge the participating fourth-year nursing students and the College of Nursing of the private higher education institution involved in the study. Participation was voluntary, informed consent was obtained prior to the non-invasive survey administration, and privacy and confidentiality were maintained through the use of questionnaires containing no identifying information. The study received ethical approval from the Institutional Ethics Review Committee (IERC), reference number 2026-IERC-00044.

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