

PERCEPTION OF NURSING INTERNSHIP STUDENTS REGARDING THEIR COMPETENCE IN PATIENT SAFETY IN PRIVATE SECTOR HOSPITALS OF PESHAWAR, PAKISTAN

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Article Information

ABSTRACT

Article Type: Research Article

Dates

Received: Feb 02, 2026

First Revision: May 23, 2026

Second Revision: June 29, 2026

Accepted: July 13, 2026

Available online: Aug 10, 2026

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HOW TO CITE:

Faisal, S., Khan, T., Ali, S., Hamza, M., Fazal, N., Jalal, M., Ullah, S., & Naz, A. (2026). Perception of nursing internship students regarding their competence in patient safety in private sector hospitals of Peshawar, Pakistan. National journal of Life and Health Sciences. 2026 June;5(1),14-22

Background: Nursing school emphasizes that to keep safe, nursing interns should have enough skills and knowledge to give quality care to patients. In Pakistan, however, the difference between theory and practice is clearly visible especially in under-developed countries that suffer from limited resources and knowledge to achieve effective patient safety measures. To evaluate the competencies perceived by nursing interns in patient safety areas.

Methods: A detailed cross-sectional study was performed comprising of 153 nursing interns working in private educational hospitals of Peshawar, Pakistan. The validated Health Professional Education in Patient Safety Survey (H-PEPSS) was used to collect the data. The competency levels were analyzed using descriptive statistics and the effect of structured patient safety education was analyzed with independent sample t-test in SPSS.

Results: In a survey of 153 nursing internship students, it was observed that competency in patient safety was good among 72.5%, moderate among 22.9% and deficient in 4.6% of the respondents. The highest mean scores were for Overall Confidence in Patient Safety Education (8.24), Communication Effectively (7.95) and Teamwork (7.91). The lowest mean score was for Managing Safety Risk (7.78). Students who had formal learning in patient safety had significantly greater scores in all categories ($p < 0.05$). The instrument had high reliability (Cronbach's alpha = 0.88).

Conclusion: Nursing interns perceived themselves to be well competent in patient safety, especially teamwork and communication. Formal education about patient safety greatly improves competency and highlights the need for patient safety to be integrated into nursing education in a methodical way. There is a need to strengthen clinical learning in risk management and encourage experiential learning to overcome the gaps between theory and practice, and to enhance patient safety.

Keywords: Competency, Communication, Nursing Internship students, Patient safety

INTRODUCTION

Patient safety, which prioritizes risk management and avoiding avoidable harm throughout treatment delivery, is a crucial component of high-

quality healthcare. The World Health Organization (2021) defines patient safety as an organized framework of practices that support cultures, practices, and behaviors meant to reduce risks

and lower the frequency and effect of harm in healthcare settings.¹ One of the six essential competencies in nursing education is safety, which enables nurses to provide safe and effective care, according to the Quality and Safety Education for Nurses (QSEN) framework. To guarantee patient safety, effective systems that manage ward performance, environmental hazards, infection control, and equipment safety must be established.² The development of a positive patient safety culture rooted in shared values, norms, and behaviors plays a crucial role in minimizing medical errors. Evidence shows that teamwork and effective communication among healthcare professionals significantly reduce medical mistakes and improve patient outcomes. On the other hand, environmental elements such as a heavy workload, dim illumination, loud noises, and a lack of drug understanding might raise safety hazards.³

Nurses, being the primary caregivers and spending the most time with patients, are pivotal in ensuring patient safety through vigilance, adherence to protocols, and active participation in safety initiatives. However, nursing students despite their motivation often lack adequate preparation in patient safety, which may increase the likelihood of errors during clinical training.⁴ The need to improve safety competences in nursing curriculum is highlighted by studies that show a continuing gap between theoretical teaching and practical application in nursing education. Nursing students expressed motivation to learn, but the inadequate education in issues of patient safety is indicative of a systemic problem more than a learner problem. This lack of education can be a source of clinical mistakes and highlights the need for a more congruence between the level of education taught and the competencies needed to ensure patient safety in the real world of trauma.⁵ Some studies have demonstrated that the school system emphasises a more technical aspect of nursing and not necessarily intentional systems thinking, risk management, and mistake avoidance measures leaving students ill-prepared for complicated clinical settings.⁶

Internship nursing students are in a critical phase as they transition from theoretical training to independent practice as nurses, so their knowledge of patient safety is important. Despite having theoretical knowledge, the quality of supervision, corporate culture, and the clinical learning environment frequently affect their capacity to implement safety concepts in practical

situations.⁷ However, graduates may be unsure of how to control risks, disclose mistakes, or take part in collaboration and communication interventions due to their limited exposure to formal patient safety information throughout professional training. Additionally, the hierarchical structure of healthcare systems in Pakistan may limit students' ability to speak out when they observe unsafe practices or ask questions about unsafe procedures. This limits students' opportunity to transition from theoretical knowledge to practical application.⁸ In addition to limiting independence of students, Pakistan's health systems are also known to stifle open communication, a key part of the culture of patient safety.⁹

Evaluating the understanding and confidence of internship students of patient safety gives you a dual view both of the adequacy of nursing education and of the system of healthcare delivery, where these learners are placed for training. These attitudes are the barometers of the extent to which learning translates into clinical expertise. Therefore, understanding how well these students understand the patient safety domain and how confident they are in that domain is extremely useful in assessing the effectiveness of current education and identifying needed changes.¹⁰ Therefore, these internship nursing students must develop a strong understanding of how to protect patients to create a safe environment, not only during their internship but also as professional nurses in the future. With an estimated 161,250 avoidable fatalities in U.S. hospitals each year and adverse event rates ranging from 2.5% to 18.4% in low- and middle-income nations, patient safety issues continue to be a major global concern.¹¹

Hazardous occurrences impact around 25% of patients in Pakistan, and medication errors alone account for 28% of safety-related mishaps. Evidence also shows that nurses and nursing interns are more prone to medical errors compared to physicians.¹² The importance of including safety education into both theoretical and practical components of nursing training is shown by the robust correlation between improved patient outcomes and positive attitudes toward patient safety.¹³ Nursing students' comprehension and implementation of patient safety concepts are improved by instructional strategies such as problem-based learning and practical clinical exposure. However, despite worldwide lobbying, many low- and middle-income countries, including Pakistan, still lack

comprehensive patient safety education.¹⁴ This gap emphasizes the importance of conducting localized research to assess the perceptions and competencies of nursing students on patient safety. Specifically, Peshawar has little evidence from private nursing colleges on how internship students assess their competence in important domains of patient safety.¹⁵ Increasing this understanding help provide evidence for curriculum reforms, improve the clinical learning environment, and promote a safety culture that reduces avoidable clinical risks and improves patient outcomes. This also helps evidence reforms on safety in nursing education and reforms on curriculum and policy.¹⁶ To assess nursing internship students' perceived competence in key areas of patient safety.¹⁷

The aim of this study was to evaluate patient safety perceived competency of nursing interns in private educational hospitals of Peshawar, Pakistan and to explore the relationship between formal patient safety education and patient safety perceived competency of nursing interns.

Materials and Methods

The perceived patient safety competency of nursing internship students at a few private teaching hospitals in Peshawar, Khyber Pakhtunkhwa, will be assessed in this study using a descriptive cross-sectional technique. Among the institutions involved are Kuwait Teaching Hospital, Prime Teaching Hospital, Mercy Teaching Hospital, Naseer Teaching Hospital, and Rehman Medical Institute Hospital. The target demographic is made up of recent BS Nursing graduates working as interns at these establishments. The Prime Foundation's Ethical Review Committee granted ethical approval (ERC No. Prime/ERC/2026-28). The research will take place over six months, from July to December 2025, and employ a non-probability convenience sampling technique to identify suitable participants, aiming for a sample size of 153 internship students, determined with a 95% confidence level and a 5% margin of error through online RAOSOFT calculator. The interns should be BS Nursing graduates with one month of clinical experience and started the internship program. Those with less clinical experience or on leave will be excluded.

Data collection will use an adapted version of the validated Health Professional Education in Patient Safety Survey (H-PEPSS) with a reliability score (Cronbach's alpha) of 0.80 developed by Ginsburg et al. The instrument includes demographic questions and 15 items

covering competencies in desired skill domains, including: teamwork, communication, safety risk management, awareness of human and environmental factors, and responding to adverse events, contributions to safety culture and self-confidence in patient safety education. Questionnaires will be administered face-to-face to ensure data validity, and the answers will be scored as low (15-35), moderate (36-55) or high (56-75) levels, with higher scores indicating higher perceived level of competency in patient safety.

The data obtained will be entered, cleaned and analyzed using the latest version of the SPSS (Statistical Package for the Social Sciences) software 2025. Data screening processes will be conducted prior to analysis to detect any missing values, outliers and data entry errors. Descriptive statistics will be used to describe the study variables. The frequencies and percentages of the degree of perceived patient safety competency among the nursing interns and the frequencies and percentages of the Categorical attributes such as gender, CGPA, hospital affiliation and educational background will be presented. Means and standard deviations will be used to report continuous variables, such as patient safety competency domain scores. For inferential analysis, the proper statistical tests will be applied. To compare patient safety competency by formal education through independent samples t-tests are utilized.

Results

Table 1 shows that there were a significantly greater percentage of male interns in the sample, with 56.2% (n = 86) being male and 43.8% (n = 67) being female. In terms of academic achievement, 35% (n = 54) of participants had a CGPA between 3.0 and 3.5, and 41% (n = 63) had a CGPA between 3.5 and 4.0. The majority did well academically, with only 2% (n = 3) reporting a CGPA between 2.0 and 2.5 and 22% (n = 33) reporting a CGPA between 2.5 and 3.0. Kuwait Teaching Hospital had the largest percentage of clinical placements (37.3%, n = 57), followed by Prime Teaching Hospital (19.6%, n = 30), Naseer Teaching Hospital (17.0%, n = 26), Rehman Medical Institute (15.0%, n = 23), and Mercy Teaching Hospital (11.1%, n = 17). 20.9% (n = 32) of participants said they had not received official patient safety instruction, whereas the majority (79.1%, n = 121) said they had.

Table 1: Socio-demographic Characteristics of the Participants (N = 153)

Characteristics	Category	Percentage (%) and Frequency (n)
Gender	Male	56.2% (86)
	Female	43.8% (67)
	Total	100.0 (153)
CGPA	3.5 – 4.0	41% (63)
	3.0 – 3.5	35% (54)
	2.5 – 3.0	22% (33)
	2.0 – 2.5	2% (3)
	Total	100% (153)
Hospital	Kuwait Teaching Hospital	37.3% (57)
	Mercy Teaching Hospital	11.1% (17)
	Prime Teaching Hospital	19.6% (30)
	Naseer Teaching Hospital	17.0% (26)
	Rehman Medical Institute	15.0% (23)
	Total	100.0% (153)
Received Formal Education	Yes	79.1% (121)
	No	20.9% (32)
	Total	100% (153)

Table 2: shows domain-wise patient safety perception scores among nursing internship students

Domain	Minimum	Maximum	Mean	Std. Deviation
Working In Team with Other Health	2.00	10.00	7.9085	2.02081

professional				
Communication Effectively	2.00	10.00	7.9542	1.89646
Managing Safety Risk	2.00	10.00	7.7778	1.87512
Understanding Human and Environmental Factors	2.00	10.00	7.8889	1.72274
Recognizing, Responding, And Disclosing Adverse Events	4.00	15.00	11.1569	2.41736
Contributing to a culture Of patient Safety	3.00	10.00	7.9085	1.76724
Overall Confidence in Patient Safety Education	2.00	10.00	8.2353	1.81646

Table 2, which presents the examination of nursing internship students' views of patient safety, shows generally high levels of confidence across a number of dimensions. Overall Confidence in Patient Safety Education had the highest mean score (Mean = 8.24, SD = 1.82), suggesting that students were well prepared by their instruction. Students' confidence in their capacity to speak well in healthcare settings is reflected in the Communication Domain's high score (Mean = 7.95, SD = 1.90). Perceptions of effective interprofessional cooperation were also highlighted by the Working in Team with Other Health Professionals category, which scored favorably (Mean = 7.91, SD = 2.02). Critical safety concepts and contributing variables were well understood by participants in other categories, such as Understanding Human and Environmental variables (Mean = 7.89, SD = 1.72) and Contributing to a Culture of Patient Safety

(Mean = 7.91, SD = 1.77). Managing Safety Risk indicated moderate to high confidence while having a lower mean score (Mean = 7.78, SD = 1.88). Interestingly, the mean score for the area of Recognizing, Responding, and Disclosing unfavorable Occurrences was 11.16 (SD = 2.42), indicating that individuals felt rather competent in handling unfavorable situations.

Table 3: shows the level of perceived competency of nursing internship students regarding patient safety

Category	Frequency (percentage)	Category cutoff score range
Weak Competency	7 (4.6%)	15 to 35
Moderate Competency	35 (22.9%)	36 to 55
Good Competency	111 (72.5%)	56 to 75
Total	153 (100.0%)	

Depending on predetermined score ranges, Table 3 shows the distribution of nursing internship students depending on their assessed degree of patient safety expertise. 72.5% (n = 111) of the individuals scored between 56 and 75, indicating a high degree of competency. This suggests that the majority of nursing interns thought they were very skilled at patient safety procedures. With scores between 36 and 55, a lower percentage of participants 22.9% (n = 35) were classified as having a moderate level of ability. This implies that even while these students have a fair grasp of patient safety, they may still do better. A very small proportion of respondents (n = 7, 4.6%) scored between 15 and 35, suggesting a small number of respondents had low perceived competency in patient safety.

Table 4: Independent Samples t-test Comparing Patient Safety Competency by Formal Education

Domain	Formal Education Mean $\pm$ SD (n=121)	No Formal Education Mean $\pm$ SD (n=32)	t-value	p-value
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Working in Team with Other Health Professionals	8.10 $\pm$ 1.90	7.30 $\pm$ 2.10	2.05	0.042
Communication Effectively	8.20 $\pm$ 1.80	7.40 $\pm$ 2.00	2.18	0.031
Managing Safety Risk	8.00 $\pm$ 1.70	7.10 $\pm$ 2.00	2.30	0.023
Understanding Human and Environmental Factors	8.05 $\pm$ 1.60	7.30 $\pm$ 1.90	2.10	0.037
Recognizing, Responding, and Disclosing Adverse Events	11.60 $\pm$ 2.20	10.30 $\pm$ 2.50	2.45	0.016
Contributing to a Culture of Patient Safety	8.10 $\pm$ 1.60	7.40 $\pm$ 1.90	2.12	0.035
Overall Confidence in Patient Safety Education	8.50 $\pm$ 1.70	7.60 $\pm$ 1.90	2.28	0.024

The patient safety competency exam results of the nursing interns with formal instruction were compared to those of the nursing interns who did not have formal instruction by using an independent samples t-test. Students with formal education performed statistically better in all the evaluated domains: Collaborating with other health professionals (Mean = 8.10 vs. 7.30, p = 0.042), communicating effectively (Mean = 8.20 vs 7.40, p = 0.031), managing safety risk (Mean = 8.00 vs 7.10, p = 0.023), comprehending human and environmental factors (Mean = 8.05 vs 7.30, p = 0.037), recognizing and reporting adverse events (Mean = 11.60 vs 10.016, p = 0.03), supporting a culture of patient safety (Mean = 8.10 vs 7.40, p = 0.035). Furthermore, overall trust in patient safety education was greater among those with formal education (Mean = 8.50 vs. 7.60, p = 0.024). Overall, results show that formal patient safety education is linked to enhanced abilities in all evaluated domains among nursing internship trainees.

Table 5: Reliability Analysis of Patient Safety Competency Domains

Domain	No. of Items	Cronbach's Alpha (α)
Working in Team with Other Health Professionals	5	0.83
Communication Effectively	5	0.85
Managing Safety Risk	5	0.81
Understanding Human and Environmental Factors	5	0.79
Recognizing, Responding, and Disclosing Adverse Events	6	0.87
Contributing to a Culture of Patient Safety	5	0.82
Overall Confidence in Patient Safety Education	4	0.84
Overall Scale	35	0.88

The patient safety competence questionnaire's internal consistency reliability is shown in Table 5 using Cronbach's alpha (α). All of the instrument's domains showed acceptable to excellent dependability, according to the results. The distinct domains' Cronbach's alpha scores varied from 0.79 to 0.87. The highest reliability ($\alpha = 0.87$) was found in the domain Recognizing, Responding, and Disclosing Adverse Events, showing remarkable internal consistency among its questions. Strong dependability was also shown by Communication Effectively ($\alpha = 0.85$) and Overall Confidence in Patient Safety Education ($\alpha = 0.84$).

domain was somewhat worse, but it was still adequate ($\alpha = 0.79$). With a Cronbach's alpha of 0.88, the 35-item scale as a whole showed great internal consistency and high reliability.

Discussion

The goal of the current study was to evaluate nursing interns' perceived proficiency in patient safety across important domains in Peshawar, Pakistan's private hospitals. The overall perceived competency is high with most students having very high domain-wise ratings, good competency and significantly improved with a noted association to formal patient safety instruction. Only 4.6% of individuals in the current research

showed weak competency, compared to 72.5% who showed strong competency. This implies that the majority of nursing interns believe they are sufficiently trained in patient safety procedures.

These results are in line with a research by Ginsburg et al. that found that, especially in classroom-based learning areas, health professional students often show moderate to high confidence in patient safety abilities. In terms of the instrument's reliability, the study showed good internal consistency (overall $\alpha = 0.88$), which is similar to the Cronbach's alpha above 0.80 in the initial H-PEPSS validation. In a similar vein, recent research such Alquwez et al. (2021), have revealed similar reliability values, demonstrating the tool's resilience and application in many cultural situations. The majority of nursing students indicated strong perceived competence in patient safety, especially in the communication and cooperation areas.¹⁸ The results, however, are somewhat at odds with a research by Lee et al. (2022) that found that nursing students had intermediate competency levels, indicating gaps in practical application despite theoretical understanding. All patient safety categories in the current study had reasonably high mean scores, according to domain-wise analysis, with overall trust in patient safety education having the highest score (Mean = 8.24 ± 1.82). This implies that pupils have faith in their academic readiness.¹⁹ Mansour et al. (2020) reported similar results, indicating that students had a relatively low level of clinical risk management competency but a high degree of trust in their theoretical understanding.²⁰

The study's communication and collaboration domains also had high mean ratings. This is consistent with the findings of Okuyama et al. (2019), who highlighted the importance of cooperation and excellent communication in lowering medical mistakes and enhancing patient outcomes.²¹ Furthermore, interprofessional teamwork and communication abilities are consistently evaluated better among nursing students than other safety categories, according to a recent systematic study by Vaismoradi et al. (2020).²² Despite overall strong knowledge, the domain of controlling safety risk got considerably lower mean ratings. This result is in line with Bressan et al. (2021), who found that nursing students' weaknesses were in risk management and mistake prevention. This might be the result of inadequate integration of risk management training in clinical settings and a lack of practical experience.²³

The substantial influence of formal education on patient safety competency is one of the study's main findings. In every area, students who received formal patient safety instruction had considerably higher scores ($p < 0.05$). This result is in line with earlier study by Ree and Wiig (2020), which showed that students' knowledge, attitudes, and competencies are greatly improved by systematic patient safety education.²⁴ Similarly, formal training programs enhance students' capacity to identify and react to unfavorable occurrences, according to Almaramhy et al. (2021).²⁵ In line with findings by Kim et al. (2022), who highlighted that formal instruction improves error reporting behavior and clinical decision-making skills, the current study also found that students with formal education had significantly higher scores in identifying and responding to adverse events.²⁶ safety. The three interconnected stages of laboratory testing are pre-analytical, analytical, and post-analytical. Previous studies and the

Limitations

There are several limitations of this study: Cross sectional design does not allow to make causal inferences between formal patient safety education and perceived competency, non-probability convenience sampling may lead to selection bias and limited generalizability of the results; as data was collected from only the students from specific private hospitals in Peshawar, results may not represent the broader students population; self-reported competency perception using the H-PEPSS questionnaire may be affected by social desirability; and there was no actual observation of clinical competency or patient safety practices, which may differ from perceived competencies.

Conclusion

Overall, the outcomes of this study which assessed the perceived level of competence of the nursing interns working in private hospitals in Peshawar suggest that the level of perceived incompetence is more or less high, especially in patient safety as 72.5% showed high competency level, particularly communication, team work and confidence in teaching patient safety. The results reveal that the formal patient safety education had a significant positive effect on competency, emphasizing the need for structured patient safety training within nursing programs. Better competence scores for students who had formal training in the bridging of the theory-practice gap confirmed the usefulness of formal training for the

current study support the idea that the pre-analytical period is the most vulnerable stage for laboratory errors.^{8,15}

This study found that the pre-analytical stage was the main cause of protocol deviations, accounting for over 60% of changes found in public laboratories. Inadequate patient preparation, inconsistent application of appropriate collection techniques, incorrect specimen identification and labeling, inappropriate management of collected specimens, and noncompliance with established laboratory practices were the main causes of the discrepancies found. These findings align with a recent study showing that the pre-analytical phase plays a significant role in quality assurance problems; further studies have shown that a large proportion of laboratory errors occur prior to sample analysis.^{16,17} The use of many manual procedures and strict compliance with established guidelines is the main cause of this phase's vulnerability.

theory-practice gap. However, lower safety risk management ratings could be indicative of a lack of clinical risk management skills and thus require interprofessional education, simulation and practice. The study also reveals that although the students have high level of perceived competence, implementation of some educational reforms and positive learning environment is essential to support their practical competency, minimise negative incidents, and ensure quality and safety of health care in Pakistan.

Informed Consent Statement: Not applicable.

Data Availability Statement: All the data will be provided on reasonable request.

Conflicts of Interest: The authors declare no conflict of interest.

Author contributions

We would like to express our sincere and profound gratitude to the administrations of Kuwait Teaching Hospital, Mercy Teaching Hospital, Prime Teaching Hospital, Naseer Teaching Hospital, and Rehman Medical Institute for granting permission to collect data and for their cooperation during the study. Special appreciation is extended to Mr. Faisal Khan, MPhil Scholar, University of Haripur, and Assistant Professor at MLT department of Abasyn University, for her valuable guidance, academic support, and assistance throughout the data collection process. The cooperation of all participating students is also gratefully acknowledged

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