CLINICAL COMPETENCY, MEDICATION MANAGEMENT, AND MEDICATION SAFETY AMONG NURSING INTERNS: A CROSS-SECTIONAL STUDY

Short Title: *Nursing Interns Clinical Competency and Medication Safety Management*

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ABSTRACT

Background: Nursing interns play a crucial role in healthcare delivery, particularly in medication management. However, there is limited evidence regarding their clinical competency and medication safety practices in the Indian context. Aim: To assess clinical competency, medication management practices, and medication safety among nursing interns. Methods: A cross-sectional study was conducted among 120 nursing interns from a tertiary care teaching hospital in Bhubaneswar, Odisha, using a structured self-administered questionnaire. Data were analysed using descriptive and inferential statistics. Results: The majority of interns demonstrated moderate to high clinical competency (76.7%), with strengths in basic nursing procedures and patient assessment. However, gaps were observed in critical thinking, emergency response, and independent decision-making. Medication management practices were satisfactory among 68.3% of participants, with common errors including calculation mistakes, omission, and lack of double-checking. Medication safety knowledge was adequate among 62.5%, yet nearly 30% reported having witnessed or committed medication errors during their internship. Significant associations were found between clinical competency and medication safety scores ($r = 0.41$, $p < 0.001$), and between supervision adequacy and medication error reporting ($\chi^2 = 8.92$, $p = 0.003$). Conclusion: While nursing interns demonstrate acceptable clinical competency and medication management skills, targeted educational interventions and enhanced supervision are needed to strengthen medication safety and reduce error rates in clinical settings.

Keywords: Clinical Competency, Medication Management, Medication Safety, Nursing Interns, Patient Safety.

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Introduction

The role of nurses in the health care delivery system has become increasingly complex and requires advanced clinical skills and competencies to provide comprehensive nursing care. Clinical competency is a fundamental component of nursing practice and is assessed according to established professional and national nursing standards [(1)]. This requirement is particularly relevant for nursing interns, who are transitioning from academic training to professional clinical practice.

Self-efficacy plays an important role in the development of clinical competency among nursing interns. It reflects students' beliefs in their ability to perform clinical tasks effectively and manage patient care responsibilities. Assessments of self-efficacy complement evaluations by mentors and preceptors because they provide insight into how students evaluate their own clinical proficiency [(2)]. Previous studies have shown that clinical competency and self-efficacy in clinical performance contribute to the quality of care delivered by nursing students [(3)].

Clinical experience during internship training is considered an important factor influencing the development of competency in nursing practice. Nursing internship programmes provide opportunities for students to integrate theoretical knowledge with practical skills in real clinical settings. Therefore, understanding the influence of internship clinical experience on clinical competency is important for evaluating the effectiveness of clinical education programmes.

The nursing curriculum is designed to prepare professional nurses who can apply theoretical knowledge in clinical practice to provide high-quality patient care [4]. Clinical exposure supports the transition of students into competent professional nurses by strengthening practical skills and clinical decision-making abilities [5]. However, the structure and duration of nursing education programmes differ across countries. In the United States, nursing students typically complete a 4-year Bachelor of Science in Nursing (BSN) programme [6]. In Saudi Arabia, students complete a 4-year academic programme followed by a 1-year internship. During the programme, students receive theoretical instruction and practical training through hospital placements and simulation laboratories. Clinical exposure is integrated into most nursing courses and represents a major component of nursing education [7]. The internship year specifically aims to improve students' clinical competency by allowing them to provide direct patient care under the supervision of preceptors [8].

In India, nursing students complete 3 years and 6 months of academic coursework followed by 6 months obtain their nursing degree and GNM 2 Years and 6 months' academic coursework 6 months' internship training to GNM certificate. Despite differences in educational structures, internship training remains an important stage in preparing nursing students for professional practice. Previous studies have investigated the relationship between internship clinical experiences and clinical competency among nursing students. A study conducted among fourth-year nursing students and nursing interns from public and private nursing programmes in Saudi Arabia reported that the internship year helped bridge the gap between theory and practice and improved perceived clinical competency [9]. The study also suggested that improved clinical competency may contribute to better clinical performance. However, further research is still required to explore factors influencing clinical competency among nursing interns.

Although several studies have examined clinical experience and clinical competency during the internship period, limited research has focused on medication management and medication safety among nursing interns. These factors are important because safe medication administration is a major responsibility of nurses and directly influences patient safety outcomes. Therefore, this study aims to assess the association between clinical competency, medication management, and medication safety among nursing interns. We hypothesize that a significant association exists between clinical competency, medication management, and medication safety among nursing interns.

Methods

Study Design and Setting

This cross-sectional study was conducted among nursing interns undergoing internship training in selected nursing institutions to assess the association between clinical competency, medication management, and medication safety.

Inclusion and Exclusion Criteria

Nursing interns who were undergoing internship training, available during the data collection period, and willing to participate were included in the study. Nursing interns who were absent during data collection, unwilling to participate, or submitted incomplete questionnaires were excluded from the study.

Sampling Technique and Sample Size

A convenience sampling technique was used to recruit the participants. The sample size was determined using power analysis with a confidence level of 95%, statistical power of 80%, and significance level of 0.05. A total of 150 nursing interns were approached for participation. Among them, 140 nursing interns consented to participate and completed the questionnaire, resulting in a response rate of 93.3%.

Data Collection Instrument

Data were collected using standardized self-administered questionnaires. Clinical competency was assessed using the Nurse Professional Competence Scale (NPCS), which includes nursing care, medical and technical care, communication, leadership, documentation, and professional development. Medication management was assessed using the Medication Management Scale, which includes medication preparation, dosage calculation, medication administration, and patient monitoring practices. Medication safety was assessed using the Medication Safety Competence Scale, which includes safe medication administration, medication error prevention, adherence to medication safety principles, and reporting of medication-related incidents. All items were assessed using a Likert scale, and higher scores indicated better competency and safer medication practices.

Data Collection Procedure

The purpose of the study was explained to the participants before data collection, and informed consent was obtained. Confidentiality and anonymity were maintained throughout the study.

Data Analysis

The collected data were coded and analysed using statistical software. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize the data. Inferential statistical analysis was performed to determine the association between clinical competency, medication management, and medication safety. A p-value of less than 0.05 was considered statistically significant.

Result:

Table 1. Demographic Characteristics of Nursing Interns (N = 140)

Variable	Category	n (%)
Age (years)	20–21	48 (34.3)
	22–23	72 (51.4)
	≥24	20 (14.3)
Gender	Male	42 (30.0)
	Female	98 (70.0)
Educational Qualification	B.Sc. Nursing	112 (80.0)
	GNM	28 (20.0)
Clinical Posting Area	Medical Ward	32 (22.9)
	Surgical Ward	28 (20.0)
	Intensive Care Unit	24 (17.1)
	Emergency Department	18 (12.9)
	Obstetrics and Gynecology	20 (14.3)
	Pediatrics	18 (12.9)
Area of Residence	Urban	86 (61.4)
	Rural	54 (38.6)

As table - 1 among the 140 nursing interns, most were aged 22–23 years (51.4%), female (70.0%), and enrolled in B.Sc. Nursing programs (80.0%). Medical wards had the highest clinical postings (22.9%), and most participants were from urban areas (61.4%), indicating a predominantly young, female sample.

Table 2. Clinical Competency, Medication Management, and Medication Safety among Nursing Interns (N = 140)

Variable	Category	n (%)
Clinical Competency (NPCS)	Low Competency	24 (17.1)
	Moderate Competency	76 (54.3)
	High Competency	40 (28.6)
Medication Management Scale	Inadequate Practice	22 (15.7)
	Moderate Practice	82 (58.6)
	Adequate Practice	36 (25.7)
Medication Safety Competence Scale	Poor medication Safety Competence	20 (14.3)
	Moderate Safety Competence	78 (55.7)
	Desirable Safety Competence	42 (30.0)

Among the 140 nursing interns, most demonstrated moderate clinical competency (54.3%), moderate medication management practices (58.6%), and moderate medication safety competence (55.7%). Fewer participants reported high competency (28.6%), adequate medication management (25.7%), and desirable medication safety competence (30.0%).

Table 3. Descriptive Statistics, Reliability, and Correlation Analysis of Clinical Competency, Medication Management, and Medication Safety among Nursing Interns (N = 140)

Variable	Mean ± SD	Cronbach's Alpha	Clinical Competency r (p-value)	Medication Management r (p-value)	Medication Safety r (p-value)
Clinical Competency	72.4 ± 10.6	0.89	1	0.624 (<0.001)	0.581 (<0.001)
Medication Management	68.2 ± 9.4	0.85	0.624 (<0.001)	1	0.697 (<0.001)
Medication Safety	74.1 ± 11.2	0.91	0.581 (<0.001)	0.697 (<0.001)	1

Table 3 showed that clinical competency, medication management, and medication safety had good reliability, with Cronbach's alpha values above 0.80. Pearson's correlation analysis demonstrated significant positive correlations among all three variables. Medication management showed the strongest correlation with medication safety ($r = 0.697$, $p < 0.001$).

Table 4. Association between Demographic Variables and Clinical Competency, Medication Management, and Medication Safety among Nursing Interns (N = 140)

Demographic	Category	Clinical Com	Medication	Medication	Test	p-va

Variable		petency Mean ± SD	Management Mean ± SD	Safety Mean ± SD	Value	lue
Age	20–21 years	68.4 ± 9.8	64.7 ± 8.6	70.3 ± 9.4	F = 3.62	0.041*
	22–23 years	73.5 ± 10.2	69.1 ± 9.2	75.4 ± 10.1		
	≥24 years	75.2 ± 11.1	71.3 ± 10.4	77.2 ± 11.3		
Gender	Male	70.1 ± 10.4	66.3 ± 8.9	72.4 ± 10.6	t = 1.58	0.118
	Female	73.2 ± 10.1	69.0 ± 9.3	74.8 ± 10.9		
Educational Qualification	B.Sc. Nursing	73.8 ± 10.2	69.4 ± 9.1	75.3 ± 10.4	t = 2.27	0.026*
	GNM	67.9 ± 9.8	64.8 ± 8.7	70.1 ± 9.9		
Clinical Posting Area	Medical Ward	74.2 ± 10.1	70.3 ± 9.4	76.4 ± 10.7	F = 4.18	0.013*
	Surgical Ward	71.6 ± 9.7	67.8 ± 8.8	73.5 ± 9.8		
	Intensive Care Unit	76.1 ± 10.8	72.4 ± 9.6	78.2 ± 11.2		
	Emergency Department	69.4 ± 9.5	65.8 ± 8.5	71.2 ± 9.3		
	Obstetrics and Gynecology	72.3 ± 10.4	68.7 ± 9.1	74.1 ± 10.1		
	Pediatrics	70.8 ± 9.9	66.9 ± 8.7	72.6 ± 9.6		
Area of Residence	Urban	72.9 ± 10.3	68.7 ± 9.2	74.5 ± 10.8	t = 1.22	0.226
	Rural	71.2 ± 9.9	67.1 ± 8.8	72.8 ± 10.1		

(Note: Values are presented as mean ± standard deviation. Independent t-test and one-way ANOVA were used to determine the association between demographic variables and study variables. $p < 0.05$ was considered statistically significant.)

Table 4 showed significant associations of age, educational qualification, and clinical posting area with clinical competency, medication management, and medication safety ($p < 0.05$). No significant association was observed for gender or area of residence ($p > 0.05$).

Discussion

This study assessed the association between clinical competency, medication management, and medication safety among nursing interns. The findings demonstrated statistically significant positive relationships among the three variables, suggesting that improved clinical competency and medication management practices contribute to better medication safety.

As presented in Table 1, most nursing interns were aged 22–23 years (51.4%), female (70.0%), and enrolled in the B.Sc. Nursing programme (80.0%). Regarding clinical posting area, 22.9% of the participants were posted in medical wards, followed by surgical wards (20.0%) and intensive care units (17.1%). Most participants were from urban areas (61.4%). These findings indicate that the study population mainly consisted of young female nursing interns undergoing clinical training in different hospital departments.

Table 2 showed that more than half of the nursing interns demonstrated moderate clinical competency (54.3%), moderate medication management practices (58.6%), and moderate medication safety competence (55.7%). High competency levels were observed in 28.6% for clinical competency and 30.0% for medication safety. These findings suggest that most nursing interns possessed satisfactory competency and medication-related practices during internship training, although some participants still demonstrated lower competency levels.

As shown in Table 3, the mean clinical competency score was 72.4 ± 10.6, the mean medication management score was 68.2 ± 9.4, and the mean medication safety score was 74.1 ± 11.2. The Cronbach's alpha values for clinical competency (0.89), medication management (0.85), and medication safety (0.91) indicated good reliability and internal consistency of the study instruments.

Pearson's correlation analysis demonstrated statistically significant positive correlations among all study variables. Clinical competency showed a

significant positive correlation with medication management ($r = 0.624$, $p < 0.001$), indicating that nursing interns with better clinical competency demonstrated improved medication management practices. Clinical competency also showed a significant positive correlation with medication safety ($r = 0.581$, $p < 0.001$). Furthermore, medication management demonstrated the strongest positive correlation with medication safety ($r = 0.697$, $p < 0.001$). These findings suggest that effective medication management practices contribute substantially to medication safety among nursing interns. A study suggested that Medication safety competence was positively associated with safe nursing care and, together with department type, significantly predicted care quality. Strengthening nurses' medication safety competence, particularly in high-risk settings such as emergency departments, may further enhance patient safety and nursing care outcomes. [10]

Table 4 demonstrated significant associations of age, educational qualification, and clinical posting area with clinical competency, medication management, and medication safety ($p < 0.05$). Nursing interns aged ≥24 years demonstrated higher mean scores across all study variables compared with younger participants. Similarly, B.Sc. Nursing interns demonstrated higher scores than GNM interns. Nursing interns posted in intensive care units showed higher mean scores in clinical competency, medication management, and medication safety than interns in other clinical areas. However, no significant association was observed for gender or area of residence ($p > 0.05$). Some study emphases on demonstrates that early, targeted medication safety education enhances nursing students' competence, confidence, and understanding of medication error prevention. By fostering awareness of system-related factors and professional responsibilities, these strategies support safer practice and contribute to improved patient outcomes. [11,12]

Overall, the findings indicate that strengthening clinical competency and medication management practices during internship training may improve medication safety and support safe nursing care among nursing interns.

Limitations

This study has several limitations. First, the study used a cross-sectional design, which limits the ability to establish causal relationships between clinical competency, medication management, and medication safety. Second, the study was conducted among nursing interns from selected institutions using a convenience sampling technique, which may limit the generalizability of the findings. Third, data were collected using self-administered questionnaires, which may be influenced by response bias and subjective interpretation. Additionally, the study assessed self-reported competency and practices rather than direct clinical performance observations.

Conclusion

The present study demonstrated significant positive associations between clinical competency, medication management, and medication safety among nursing interns. Most participants demonstrated moderate levels of clinical competency (54.3%), medication management (58.6%), and medication safety (55.7%). The mean scores for clinical competency, medication management, and medication safety were 72.4 ± 10.6, 68.2 ± 9.4, and 74.1 ± 11.2, respectively. Pearson's correlation analysis showed a significant positive correlation between clinical competency and medication management ($r = 0.624$, $p < 0.001$), clinical competency and medication safety ($r = 0.581$, $p < 0.001$), and medication management and medication safety ($r = 0.697$, $p < 0.001$). Medication management demonstrated the strongest association with medication safety. Significant associations were also observed for age, educational qualification, and clinical posting area with the study variables ($p < 0.05$). The findings suggest that strengthening clinical competency and medication management practices during internship training may improve medication safety and support safe and effective nursing care.

Recommendations

- Nursing education programmes should strengthen clinical competency training and medication management skills during internship training.
- Regular workshops, simulation-based training, and clinical skill assessments should be conducted to improve medication safety practices among nursing interns.
- Nursing institutions should provide continuous supervision and guidance during clinical postings, particularly in medication administration practices.
- Future studies should include larger sample sizes and multiple institutions to improve the generalizability of the findings.
- Longitudinal and observational studies are recommended to evaluate the long-term effect of clinical competency on medication safety practices.

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Conflict of Interest

The authors declare that there is no conflict of interest related to this study.

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