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The Relationship Between Knowledge, Attitudes, and Motivation in the Perception of Implementation Seven Rights Medication Administration among Nursing Professional Students

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Abstract

Medication administration errors continue to be a significant concern in patient safety, including among nursing professional students. This study aimed to analyze factors related to the implementation of the seven rights of medication administration among professional nursing students at Universitas Andalas. This quantitative study used a correlational design with a cross-sectional approach and involved 114 nursing professional students. Data were collected using questionnaires including ASPAM, and researcher-developed questionnaires were tested for validity using Pearson Correlation and reliability using Cronbach's alpha, showing that all items are valid and reliable. Statistical analysis included univariate, bivariate, and multivariate tests, used Pearson Product-Moment correlation and multiple linear regression tests. The findings indicated that students generally had high knowledge and motivation levels (mean= 13,44 and 47,73), along with positive attitudes (mean= 66,74), and good implementation practices (mean= 117,11). There were significant relationships between knowledge (p= 0,001), attitudes (p=0,000), and motivation (p=0,000) with implementation, and attitude identified as the most dominant factor. These findings highlight the need to strengthen patient safety attitudes through clinical learning strategies such as case studies and simulations, to improve students' self-awareness, and to develop attitude-based interventional research to enhance the implementation of the seven rights of medication administration.

Keywords: Patient Safety, Nursing Students, Motivation, Seven Rights of Medication Administration, Attitude

INTRODUCTION

The Ministry of Health has established six patient safety goals as mandatory standards for all healthcare facilities, one of which focuses on improving the safety of high-alert medications (Permenkes RI No. 11 tahun 2017). Medication administration errors remain a frequent occurrence in clinical settings and may have fatal consequences for patients, ranging from permanent injury to death (Gutawa et al., 2025). The medication administration phase is particularly vulnerable to various types of errors, including healthcare provider negligence, improper drug administration techniques, and incorrect dosing. A study by Jessurun et al. (2023) reported that, out of 2,576 medication administrations, 380 cases were identified as errors occurring during the administration stage. Furthermore, a study by Gutawa et al. (2025), which reviewed medication error incidents across

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multiple studies, found that administration errors accounted for approximately 21% of the total medication errors reported.

The administration stage of medication delivery is a primary nursing responsibility, nurses have a crucial role in minimizing medication errors by ensuring accurate drug administration, providing patient education, and consistently following established safety protocols (Dwi et al., 2025). Medication administration errors not only affect the quality of healthcare services but also have adverse consequences on patient outcomes. It is highly error-prone, which may adversely affect patient outcomes, including injury, increased morbidity and mortality, and prolonged hospital stays (Utami & Muchlis, 2024). The burden includes adverse drug events (ADEs) originating in primary care that result in hospital admissions, with an estimated cost of 83.7 million and approximately 627 associated deaths. In addition, ADEs occurring in secondary care contribute to prolonged hospital stays, incurring costs of around £14.8 million and causing or contributing to 1,081 deaths (WHO, 2022). World Health Organization reported that medication administration errors account for a substantial proportion of overall medication errors (54,4%) (WHO, 2022).

Nursing students, as a prospective health worker, are also at risk of being involved in medication administration errors, particularly actions that do not comply with established standards. An integrative review conducted by Stolic et al. (2022) reported that the prevalence of medication administration errors committed by nursing students ranged from 1% to 6.6%. Additionally, a study by Khalili, as cited in Shahzeydi et al. (2025), found that 15% of 87 students committed medication administration errors during a three-month clinical internship.

Nursing students must be equipped with sufficient knowledge, positive attitudes, strong motivation, and adequate clinical experience to properly implement the seven rights of medication administration. Knowledge is crucial to implementing the seven rights of medication administration. Students with a strong understanding of medication types, dosages, side effects, and administration procedures tend to demonstrate greater compliance during clinical practice. According to Bloom's Taxonomy, knowledge belongs to the cognitive domain, which encompasses the abilities to remember, understand, apply, analyze, evaluate, and create, serving as the foundation for behavior formation (Anderson & Krathwohl, 2001). These cognitive abilities are essential for enabling students to properly implement the seven rights of medication administration in accordance with standard procedures.

As future healthcare professionals, nursing students are expected to demonstrate positive attitudes that support patient safety by implementing medication safety practices. According to Lawrence Green, attitude is a predisposing factor that contributes to the formation of individual behavior, reflecting an individual's tendency to accept or reject an action and influencing readiness to act in accordance with established standards (Green et al., 2022). Attitudes are shaped through education, environmental influences, social interactions, workplace culture within healthcare units, and access to information (Nuryani et al., 2021).

In addition to knowledge and attitudes, motivation is another important factor influencing students' behavior regarding safe medication administration. Motivation, defined as the drive to act to achieve specific goals, is often manifested in behavior (Swarjana, 2022). According to Self-Determination Theory (SDT), motivation consists of intrinsic motivation, which arises from individual awareness and responsibility, and extrinsic motivation, which is influenced by environmental factors (Ryan & Deci, 2020). A study by Khoirurakhmawati et al. (2020) demonstrated a significant relationship between nurses' motivation and the implementation of the principles of correct medication administration. Other studies have also identified various factors influencing medication safety among healthcare workers, including motivation and awareness of safety protocols (Lalujan & Musharyanti, 2021).

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These findings suggest that, despite ongoing efforts to improve medication safety education, students' behavior in clinical practice has not yet reached optimal levels. This issue is reflected in the continued occurrence of medication administration errors among nursing students during clinical practice. An integrative review by Stolic et al. (2022) reported that the prevalence of medication administration errors among nursing students ranged from 1% to 6.6%. Furthermore, a study by Khalili, as cited in Shahzeydi et al. (2025), found that 15% of 87 nursing students committed medication administration errors during a three-month clinical internship. Given that nursing students are directly involved in medication administration during clinical practice, these findings highlight the need to further explore factors influencing safe medication practices. However, evidence regarding the implementation of the seven rights of medication administration among professional nursing students, particularly in Universitas Andalas, remains limited. Therefore, this study aims to examine the factors associated with the implementation of the seven rights of medication administration among professional nursing students at Universitas Andalas.

METHODS

This study used a quantitative approach with a correlational design and cross-sectional method. The research was conducted among professional nursing students at the Faculty of Nursing, Universitas Andalas. The population consisted of all students who were actively undergoing clinical practice. A total of 114 respondents who met the inclusion criteria were selected using consecutive sampling technique. Ethical approval for this study was obtained from the Health Research Ethics Committee Faculty of Nursing Andalas University with approval number 670.layaketik/KEPKFKEPUNAND.

Data were collected using four questionnaires included of ASPAM (Patient Safety Assessment in Medication Administration) which consists of 27 items measuring implementation of the seven rights medication. The other questionnaires were developed by the researcher based on relevant literature to measure knowledge, attitudes, and motivation. The researcher-developed questionnaires were tested for validity using Pearson correlation and reliability using Cronbach's alpha. All items were found to be valid (r > r-table), and the reliability coefficients showed acceptable internal consistency (Cronbach's alpha > 0.70).

Knowledge was measured using 15 items questions used a Guttman scale. The questionnaire was tested for validity and all items were found to be valid (r 0,969 – 0,970 > r table 0,623). The reliability test showed a Cronbach's alpha value of > 0,6 indicating good internal consistency. Attitude was assessed using a 20 item questionnaire adapted from previous studies and modified by the researcher. The instrument employed a Likert scale. Validity testing using Pearson correlation indicated that all items were valid (r 0.436 – 0.724 > r table 0,361), and the reliability test showed a Cronbach's alpha value of 0,749, indicating acceptable reliability. Motivation was measured using a 15 item questionnaire used a Likert scale. The results of the validity test showed that all items were valid (r 0,372 – 0,815 > r-table 0,361), and the reliability test showed a Cronbach's alpha value of 0,899, indicating good reliability.

The categorization of each variable was determined based on the total score obtained. The implementation variable was categorized as poor ($X < 63$), moderate ($63 \leq X < 99$), and good ($X \geq 99$). Knowledge was categorized as low ($X < 5$), moderate ($5 \leq X < 10$), and high ($X \geq 10$). Attitude was categorized as poor ($X < 40$), moderate ($40 \leq X < 60$), and good ($X \geq 60$). Motivation was categorized as low ($X < 30$), moderate ($30 \leq X < 45$), and high ($X \geq 45$). Data were analyzed using univariate analysis to describe frequency distributions and mean values; bivariate analysis using the Pearson Product-Moment correlation test due to the normal distribution of the data. Furthermore, multivariate analysis was carried out using multiple linear regression to identify the most influential factors.

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RESULTS

The results of this study are presented in the following table.

Table 1. Demographic Characteristics of Respondents

Variable		f	%
Gender			
Female		105	92,1
Male		9	7,9
Variable	**Mean**	**Min**	**Max**
Age	22,58	21	27
Duration of Clinical Practice (months)	5,96	5	6

Based on Table 1, the majority of respondents were aged 22–23 years. Nearly all respondents (92.1%) were female, and their clinical practice experience was relatively similar, ranging from 5 to 6 months.

Table 2. Mean Scores of Implementations, Knowledge, Attitudes, and Motivation (n = 114)

Variable	Mean	SD	Min	Max
Implementation of the Seven Rights of Medication Administration	117,11	11,224	86	135
Knowledge	13,44	1,370	9	15
Attitudes	66,74	7,306	49	79
Motivation	47,73	6,844	34	60

Table 2 shows that most respondents demonstrated good competence in implementing the seven rights of medication administration. The respondents' knowledge level was high, with a mean score of 13.44. Their attitudes were categorized as good, with a mean score of 66.74, and their motivation level was also high, with a mean score of 47.73.

Table 3. Relationship between Knowledge, Attitudes, and Motivation in the Implementation of the Seven Rights of Medication Administration (n = 114)

Independent Variable	Dependent Variable	r	r^2	p (value)
Knowledge	Seven Rights Implementation	0,305	0,093	0,001
Attitudes	Seven Rights Implementation	0,585	0,342	0,000
Motivation	Seven Rights Implementation	0,490	0,240	0,000

The results of the Pearson correlation test indicated that knowledge had a significant positive relationship with the implementation of the seven rights, although the strength of the relationship was relatively weak (p = 0.001). A significant positive relationship with a moderate strength of association was also found between attitudes and the implementation of the seven rights of medication administration (p < 0.000), as well as between motivation and the implementation of the seven rights of medication administration (p < 0.000).

Table 4. Multivariate Analysis Using Multiple Linear Regression

Independent Variable	β	p (value)
Knowledge	0,085	0,291
Attitudes	0,416	0,000
Motivation	0,259	0,003

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The multivariate analysis using Multiple Linear Regression revealed that attitude was the most dominant factor influencing the implementation of the seven rights of medication administration, as evidenced by the largest regression coefficient (β = 0.416). This finding suggests that attitude accounts for 41.6% of the implementation of the seven rights of medication administration, while the remaining 58.4% is influenced by other factors.

DISCUSSION

Seven Rights Implementation

Based on the mean score of 117.11, which falls into the "good" category, the implementation of the seven rights of medication administration among professional nursing students was considered good. This finding suggests that students demonstrate adequate competence in administering medications in accordance with established standards. This result is consistent with the study by Rokhmiati & Purnamasari (2024), which found that most nurses complied with the seven rights of medication administration, although a small proportion did not consistently adhere to the protocol. The successful implementation of the seven rights is influenced by factors such as knowledge, attitudes, and motivation (Osuchukwu et al., 2024; Shahzeydi et al., 2025).

Although the overall implementation score for the seven rights was relatively high, some students still performed medication administration inconsistently and suboptimally on certain items, such as administering medications based on verbal orders without written prescriptions and failing to return unused medications to the pharmacy. These findings may be related to limited adherence to patient safety principles, time constraints, and suboptimal clinical supervision during practice (Rokhmiati & Purnamasari, 2024).

Knowledge

The results showed that the mean knowledge score was 13.44, which falls into the "high" category, indicating that students had a good understanding of medication administration concepts, including the seven rights. Knowledge, as part of the cognitive domain in Bloom's taxonomy, plays a fundamental role in shaping behavior.

This finding is consistent with Sidauruk & Boyoh (2021) study, which reported that most professional nursing students had good knowledge of the ten rights of medication administration. Saputra et al. (2022) also stated that individuals with higher knowledge levels tend to apply medication safety principles more accurately than those with lower knowledge levels. This is further supported by the study of Pratiwi et al. (2025), reported that students with good knowledge of patient safety were more likely to demonstrate compliant patient safety behaviors.

However, several items related to the components of the seven rights, particularly the right medication and right route, were frequently answered incorrectly. This may indicate variations in students' understanding, possibly influenced by prior exposure to earlier concepts such as the six rights of medication administration, leading to incomplete comprehension of the updated seven rights principle.

Attitudes

The mean attitude score of 66.74 falls into the "good" category, indicating that students generally demonstrated positive attitudes toward medication safety practices. According to Green's theory, attitude is a predisposing factor that influences behavior (Pakpahan et al., 2021), suggesting that

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positive attitudes reflect readiness to comply with patient safety standards. This finding is consistent with Sidauruk & Boyoh (2021) study, which reported that most students' attitudes toward medication safety ranged from moderate to good. Environmental factors and interactions with others influence an individual's attitude.

Despite generally positive attitudes, some respondents still exhibited less favorable practices, such as administering liquid medications that had changed color, verifying patient identity using only the patient's name, underreporting incidents, using unlabeled medications, and breaking tablets by hand. These findings suggest that although attitudes are generally positive, consistency in applying patient safety principles across all clinical situations remains a challenge (Sidauruk & Boyoh, 2021). Strengthening awareness and reinforcing patient safety attitudes through continuous supervision and training are therefore essential.

Motivation

The mean motivation score of 47.73 falls into the "high" category, indicating that students had strong motivation to implement the seven rights of medication administration. This reflects both intrinsic and extrinsic factors that support safe practice. This finding aligns with the study by Widari et al. (2024), which reported that most nursing students had motivation levels in the moderate category. It is also supported by Ambali et al. (2023), who found that most nurses demonstrated positive motivation to implement the seven rights medication administration.

High motivation may be influenced by awareness of professional responsibilities as future nurses and by support from the clinical practice environment. According to Self-Determination Theory, motivation can come from intrinsic and extrinsic sources that encourage individuals to achieve optimal practice standards. However, lower scores were identified in items related to external support, such as limited training opportunities, insufficient support from clinical staff, and lack of recognition. These findings suggest that while intrinsic motivation is relatively strong, inadequate external support may affect the consistency of implementation in clinical practice.

Relationship between Knowledge and the Implementation of the Seven Rights Medication

The bivariate analyze showed a significant relationship between knowledge and the implementation of seven rights of medication administration ($p = 0.001$). This finding indicates that higher levels of knowledge are associated with better implementation of the seven rights. This result is consistent with Ambali et al. (2023) who found a significant relationship between knowledge and nurses' compliance with the seven rights of medication administration. Similarly, Rusdianto & Rahman (2025) reported that nurses with greater knowledge of medication administration demonstrated higher adherence to the seven rights than those with lower levels of knowledge.

Adequate knowledge of the seven rights serves as a fundamental basis for shaping safe behaviors among professional nursing students during clinical practice (Osuchukwu et al., 2024). Students with a strong understanding of the components of the seven rights are better able to prevent medication administration errors.

Relationship between Attitudes and the Implementation of the Seven Rights Medication

The bivariate analysis showed a significant positive relationship between attitudes and the implementation of the seven rights of medication administration ($p < 0.001$), indicating that more positive attitudes are associated with higher levels of implementation among professional nursing students at Universitas Andalas. This finding aligns with the study by Ambali et al. (2023), which found

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a significant relationship between nurses' attitudes and compliance with the seven rights of medication administration ($p < 0.05$), as well as the study by Widari et al. (2024), which reported that nursing students' attitudes were significantly associated with patient safety implementation during clinical practice.

Although most students demonstrated positive attitudes and good implementation, negative responses were still observed in several areas, including administering discolored liquid medications, verifying patient identity solely by name, a low incident-reporting culture, using unlabeled medications, and breaking tablets by hand. These findings suggest that although students' attitudes tend to be positive, attitude consistency across all clinical situations—particularly during busy conditions—still requires strengthening (Nuryani et al., 2021).

Relationship between Motivation and the Implementation of the Seven Rights Medication

The bivariate analysis indicated a significant positive relationship between motivation and the implementation of the seven rights of medication administration ($p < 0.001$), indicating that higher motivation is associated with better implementation among professional nursing students at Universitas Andalas. This finding is consistent with the study by Marpaung et al. (2025), which found a significant relationship between motivation and compliance with patient safety practices among undergraduate nursing students, as well as the study by Ambali et al. (2023), which reported that nurses with positive motivation were more compliant in implementing the seven rights of medication administration. However, this finding contrasts with the study by Machelia et al. (2022), which found no correlation between motivation and nurses' compliance in medication administration, suggesting that compliance was more strongly associated with individual characteristics such as age, gender, education level, and length of employment.

This study indicates that students' motivation to implement the seven rights is primarily driven by intrinsic motivation related to awareness and professional responsibility. However, extrinsic motivational factors, such as limited training, lack of recognition, and insufficient supervision from clinical instructors, were found to influence the consistency of implementation. Higher motivation particularly intrinsic motivation-enhances students' commitment to patient safety standards, although weak external support may affect consistency in clinical practice (Ambali et al., 2023).

Attitude as the Most Influential Factor in the Implementation of the Seven Rights of Medication Administration

The multivariate analyze using multiple linear regression showed that among all variables, attitude was identified as the most influential factor ($p < 0.001$; $\beta = 0.416$). The regression coefficient (β) indicates that for every one-unit increase in attitude score, the implementation score increases by 0.416 units, assuming other variables remain constant. This result is consistent with the study by Peronika (2025), which found that students' attitudes were significantly associated with compliance with patient safety practices, as did Sidauruk & Boyoh (2021), which reported a positive relationship between attitudes and compliance with patient safety practices ($p = 0.001$). Sim (2022) also identified attitude as a strong predictor of patient safety behavior.

Although students generally demonstrated positive attitudes, several unsafe practices were still observed, indicating the need for further reinforcement of patient safety attitudes to ensure consistent implementation in clinical practice (Sidauruk & Boyoh, 2021).Positive attitudes encourage students to remain compliant with patient safety principles, although several aspects still require improvement, including administering discolored liquid medications, verifying patient identity solely

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by name, a low incident-reporting culture, the use of unlabeled medications, and breaking tablets by hand.

CONCLUSION

This study concludes that nursing professional students generally have high levels of knowledge, positive attitudes, and strong motivation regarding the implementation of the seven rights of medication administration. The implementation itself was categorized as good. There were significant relationships between knowledge, attitudes, and motivation with the implementation of the seven rights. Among these factors, attitude was identified as the most influential variable. Therefore, nursing education institutions are expected to strengthen the development of patient safety attitudes, healthcare institutions are encouraged to enhance the role of clinical instructors, professional nursing students are urged to increase awareness and compliance with medication administration standards, and future research is recommended to develop broader study designs and explore additional variables related to medication safety.

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