

PERCEPTION OF MEDICATION ADMINISTRATION ERROR AND ITS CONTRIBUTING FACTORS AMONG NURSING STUDENTS: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Medication administration errors are a major concern in the healthcare industry because they have the potential to compromise patient safety and lower the standard of care. Nursing students are particularly prone to these errors because of their lack of clinical experience, inadequate information, heavy workloads, and insufficient supervision during clinical practice. Understanding how nursing students perceive medicine delivery errors and the variables that lead to them is essential to improving medication and nursing education.

Objective: This study aimed to identify and analyze the contributing factors to medication administration errors among nursing students at Bahria Town School of Nursing and Akhtar Saeed College of Nursing.

Methodology: A descriptive cross sectional study design was used. A total of 80 final year Bachelor of Science in nursing (BSN) students were selected through purposive sampling. Data was collected using an adapted structured questionnaire. The collected data were analyzed using Statistical Package (SPSS) version 23. Descriptive statistics, including frequencies and percentages were used to summarize the findings.

Results: The most common medication errors were found to be wrong-time (37.5%) and wrong dosage (33.8%). Wrong frequency errors were the least frequent (8.8%), whereas omission and prescription errors each accounted for (10.0%). During clinical practice, almost half of the respondents said they made mistakes when administering medications and many acknowledged doing so. Despite the fact that the majority of participants acknowledged the significance of reporting error.

Keywords: Medication administration errors, Nursing students, Medication safety, Patient safety, Contributing factors, Clinical practice, Wrong-time errors, Wrong-dose errors, Medication administration, Nursing education, Error reporting

1. Introduction

1.1 Background of the study

Medication Administration errors are a large concern in healthcare systems around the world. They can endanger the safety of patients and the quality of healthcare. Nurses, who are responsible for administering patients with their medications, play a crucial role in ensuring that

the process is safe and accurate. However, factors such as a heavy workload, lack of staff, lack of resources, and lack of training can contribute to errors (Afaya, Konlan et al. 2021). These errors can occur during prescribing, preparing, administering, or recording medications, and they can lead to delayed recovery, adverse effects, or even death. Nursing

students also struggle with reporting these errors because they lack knowledge about patient safety and believe that it will result in bad effect (Nooriyan, Ahmadi et al. 2025).

Errors in giving medicine can happen at any point in the process of using the medicine, such as when it is prescribed, transcribed, dispensed, given, or monitored. This study concentrates on errors that transpire during the administration phase, predominantly involving nursing students. You can put these mistakes into groups, such as giving the wrong dose, drug, patient, route, or time, or missing a dose. Each type of mistake has its own causes and effects, so we need different ways to stop and fix them (Ahmad, Angez et al. 2025).

The largest group of individuals who are employed within the healthcare industry is nursing. Additionally, nurses actually spend more time with patients than any other type of healthcare professional. Because of this, nurses have the ability to protect patients and reduce errors (Levett-Jones, Andersen et al. 2020).

Nurses in developed and developing countries have noted that there are many instances of medication errors. Approximately 7,000 people worldwide make errors with their medications each year. Such errors have severe impacts, threatening the patients' safety, increasing healthcare costs, and causing a significant amount of stress to patients and their families (Mohammed, Taha et al. 2025). Medication errors can cause patients to lose confidence in the healthcare system (Smith, 2017).

Patient safety in the healthcare setting refers to doing the right thing to ensure that patients are protected and their care improved (Albalawi, Kidd et al. 2020). The World Health Organization (WHO) has defined patient safety as preventing avoidable harm to patients. There is a great reliance on the training of healthcare professionals (HCPs) to improve patient care (Vaismoradi, Tella et al. 2020).

In a study conducted on the effect of medication errors (MEs) on the reactions of nurses in a healthcare setting, it was found that most nurses felt that MEs did not have much of an impact on patient safety. This tendency to trivialize MEs may lead to a number of complications in a healthcare setting. Unintentional MEs can also have a large impact on patients and healthcare professionals (Mousa, Salameh et al. 2024).

The administration phase is very significant in the drug process because it is the final step in which the patient receives the drug. The parenteral route, which involves intravenous, subcutaneous, and intramuscular routes, requires special care since it involves more complex steps than simply administering the drug (Sousa, da Silva Fernandes et al. 2025).

It is important to provide future nurses with comprehensive training in patient safety. This will ensure that patients remain safe and that the culture of patient safety remains strong as healthcare systems continue to become more complex (Jang, Lee et al. 2022).

Students may not have sufficient formal or informal education about handling errors. Educating medical students about patient safety, developing a culture of patient safety, and educating them on how to report errors properly can all contribute to them reporting errors more frequently (Mousa, Salameh et al. 2024).

The way students think about risk has a significant influence on the way they dispense medications. A qualitative study showed that many factors can influence the way nursing students think about risk before they become licensed practitioners. These factors include a lack of knowledge about pharmacology and how to determine the correct dose, insufficient clinical experience, and a normal fear of making errors (Jones, Boltz et al. 2022).

Cultivating teamwork skills among nursing students during their education can help decrease medical errors in the preoperative setting, thereby improving the quality of care provided to surgical patients (Şimşek, Özmen et al. 2024).

A patient's safety culture is a smart and effective way to lower the number of MAEs that happen in health care settings. Keeping patients safe is the most important part of good health care, and this should never be put at risk when giving care (Bam, Safowaa et al. 2021).

1.2 Problem Statement

Medication Administration errors remain a serious threat to patient safety worldwide, especially in low- and middle-income countries. Nurses play a critical role in the medication administration process, and nursing students, as future healthcare professionals, begin developing medication administration skills

during their clinical training. However, due to limited clinical experience, insufficient knowledge, anxiety, inadequate supervision, and heavy workloads, nursing students may be at increased risk of committing medication administration errors.

Perception regarding medication administration errors is an important factor that influences nursing students' medication practices, adherence to safety guidelines, and willingness to report errors. Students who lack adequate understanding of the causes, consequences, and prevention of medication errors may be more likely to engage in unsafe practices, thereby compromising patient safety. Despite the growing emphasis on patient safety in nursing education, studies have reported that many nursing students possess inadequate knowledge and misconceptions regarding medication administration errors and their reporting procedures.

A study of nursing students in Ghana found that over 75% thought medication errors were common, mostly because there wasn't enough clinical supervision and the students had too much work to do (Ofosu 2015).

During my clinical rotations, I noticed that nursing students often don't ask questions or record near-misses, even though there are rules in place and staff members are there to help. This means that mistakes are not reported as often as they should be, and students miss out on chances to learn. This gap between knowing something and doing it is a huge challenge for patient safety in healthcare settings, especially when it comes to providing pharmaceuticals in high-acuity scenarios when mistakes can have devastating effects. The consistently elevated rates of medication errors in hospitals worldwide indicate that inadequate perceptions and attitudes among nursing students substantially exacerbate this issue, highlighting the critical necessity for focused educational strategies, simulation-based training, and the creation of an absolving culture for reporting within nursing education.

1.3 Significance of the Study

This study is very important for nursing education, clinical practice, and keeping patients safe. Based on nursing students' views of these mistakes, the study gives useful

information about the main reasons why medication administration errors happen and go unreported during clinical training. It is important for nursing students to understand these points of view because they are learning about how to correct administration and how to keep medications safe.

By identifying specific gaps in knowledge, such as misunderstandings about how to calculate safe dosages or false beliefs about how to administer medicine and reporting, as well as perceptual barriers like fear of punishment, guilt, or a lack of self-worth, educators and policymakers can create more effective, evidence-based ways of teaching. Healthcare organizations and nursing schools can use these results to make programs that deal with the specific problems that were found instead of using general training modules.

This study shows the real-life experiences of nursing students, who are very important to the healthcare system. The research acknowledges the difficulties individuals face when expressing their opinions, such as fear of consequences, distrust of pharmaceuticals, and insufficient regulation (Tomas and Fillipus 2024).

Nursing students go through every day and what problems they face. This will help teachers and healthcare leaders understand them better and help them more. This study aims to improve patient safety by looking at how well students understand, feel about, and act on medication safety. This will lower the risk of mistakes and strengthen the important nursing duty to protect and advocate for their patients.

1.4 Research Objective

To identify and analyze the contributing factors to medication administration errors among nursing students at Bahria Town School of Nursing and Akhtar Saeed College of Nursing.

1.5 Research Question

What are the key factors contributing to medication administration errors among nursing students?

3.METHODOLOGY

3.1 Study Design

A descriptive cross-sectional study design was used to explore perception of medication administration errors (MAEs) and the factors

contributing to these errors among nursing Students in Bahria Town School of nursing and Akhtar Saeed College of Nursing.

3.2. Variables

3.2.1 Dependent Variable

- medication administration error

3.2.2 Independent Variables

- academic stress
- lack of knowledge
- perception

3.3. Definitions

3.3.1. Operational Definitions

• Perception

Refer to how Healthcare Professionals particularly Nursing students understand recognize errors that occur during preparation and administration of medication.

• Medication Error

Medication error means a mistake in giving or handling medicine that harm a patient or make the treatment unsafe. It happens when the wrong medicine, wrong dose, wrong patient, wrong time or wrong way of giving medicine is used.

• Error

An error is a mistake or something done incorrectly instead of right way or an error is doing wrong by accident.

3.3.2. Conceptual Definitions

• Medication error

A medication error is a failure in the treatment process that leads to, or has the potential to lead to, harm to the patient (Aronson, 2009).

• Perception

"Perceiving is the process by which evanescent sensations are linked to environmental cause and made enduring and coherent through the assignment of meaning, utility, and value (Albright, 2015).

• Errors

Errors have been defined in terms of failed processes without any link to subsequent Harm (Hofer et al., 2000).

3.4. Study Settings

The study was conducted at Bahria town School of Nursing and Akhtar Saeed College of

3.5. Study Population

Nursing Students in BSN Final year.

3.6 Sampling Technique

A purposive sampling technique was employed to select participants for the study. Sample selection Sample was selected on the basis of the following inclusion criteria and exclusion criteria.

3.7. Sample Size

The sample size was calculated through

$$n = N / (1 + N * e^2)$$

Total population (N=100) Margin of error (e=0.05)

the calculation would be: $n = 100 / (1 + 100 * (0.05)^2)$ $n = 80$

"Slovin's Formula Calculator." Calculatorultra.com, Last modified 2024-10-03 22:10:16.

<https://www.calculatorultra.com/en/tool/slovin-formula-calculator.html>.

3.8. Study Duration

The research project was completed within 3 months of acceptance of proposal.

3.9. Research Tool

Questionnaire adapted to collect data for the assessment of the intention of nurses to report medication error at tertiary care hospital, Country (Jember et al., 2018).

3.10. Eligibility Criteria

3.10.1 Inclusion Criteria

- Students registered in BSN Final year.
- BSN Final year students currently working in clinical areas with direct patient contact (wards, ICU, emergency, operating theatre, outpatient clinics).
- Students who provided informed consent to take part in the study.

3.10.2. Exclusion Criteria

- First-year to Third year nursing students who had not yet commenced clinical practice at the time of the study Nursing students who were absent, on academic leave, or not present during data collection, as cross-sectional studies require assessment at a single point in time.
- Students who declined or withdrew consent

to participate.

3.11. Validity and reliability

In this study, validity was maintained through the use of a structured cross-sectional research design that focused specifically on medication administration errors and their contributing factors among nursing students. The research objectives, questions, and variables were clearly aligned with the topic of medication safety and nursing students' perceptions.

The study also strengthened its content validity by reviewing recent and relevant literature related to medication administration errors, patient safety, and nursing education. The questionnaire and study variables were based on findings from previous studies, which helped ensure that the tool covered the important aspects of medication errors such as wrong dosage, wrong timing, omission errors, and reporting practices. Furthermore, the inclusion and exclusion criteria were clearly defined, which improved the accuracy and relevance of the collected data.

In this study, reliability was supported by using a standardized method of data collection for all participants. All respondents were given the same questionnaire and data were collected under similar conditions, which helped reduce inconsistencies in responses.

Content Validity Index (CVI): Typically ranges from (0.80) to (0.90) for individual items (I-CVI) and above (0.80) for the overall scale (S-CVI).

Cronbach's Alpha (α): The overall internal consistency of these questionnaires reliably falls between (0.70) and (0.90) .

Subscale Reliability: Subscales (e.g., barriers to reporting) typically range from (0.65) to (0.85) .

3.12. Data analysis

Descriptive statistics (mean, SD, frequency, percentage) and inferential statistics (chi-square, correlation, etc.) by using SPSS 23.

3.13. Ethical Considerations

The rules and regulations set by the ethical committee of Bahria Town School of Nursing Lahore will be followed while conducting the research and the rights of the research participants will be respected.

- Written informed consent will be taken from all the participants.
- All information and data collection will be kept confidential.
- Participants' identity will be kept confidential throughout the study.
- The subjects will be informed that there are no disadvantages or risks on the procedure of the study.
- They will also be informed that they will be free to withdraw at any time during the process of the study.
- There is no known risk associated with this research.
- Participants' privacy will be protected. And their identity will not be revealed in any publication resulting from this study.
- The participation in this research study is voluntary. You may choose not to participate and you may withdraw your consent to participate any time. You will not be penalized in any way should you decide not you participate or to withdraw from this study.

4. RESULTS

This chapter presents the findings of the study on the perception of medication administration errors and contributing factors among nursing students. The data were analyzed and presented in the form of frequencies and percentages. The results are organized into demographic characteristics of respondents, types of medication errors encountered, and respondents' views regarding medication administration errors.

A total of 80 nursing students participated in the study. The demographic characteristics included sex, age, marital status, and educational status

Table 4.1 Demographic Characteristics of Respondents

Variables	Categories	Frequency	Percentage
Gender	Male	47	58.8%
	Female	33	41.3%
Age	19-29 years	73	91.3%

	30–39 years	7	8.8%
Marital Status	Married	2	2.5%
	Single	78	97.5%
Educational Status	BSN	80	100%

The findings revealed that the majority of respondents were male students (58.8%), while female students accounted for 41.3% of the participants. Most respondents were between 19–29 years of age (91.3%), indicating that the study population mainly consisted of young

nursing students.

The majority of respondents (97.5%) were single, while a small proportion (2.5%) were married. Furthermore, all participants were enrolled in the Bachelor of Science in Nursing (BSN) program

Table 4.2 Types of Medication Errors Encountered

Type of Medication Error	Frequency	Percentage
Omission	8	10.0%
Wrong Dosage	27	33.8%
Wrong Time	30	37.5%
Wrong Frequency	7	8.8%
Prescribing Error	8	10.0%

The findings showed that wrong-time medication errors were the most commonly encountered errors among nursing students, accounting for 37.5% of responses. This was followed by wrong-dosage errors (33.8%). Omission and prescribing errors each represented 10.0% of the responses, while

wrong-frequency errors were the least encountered at 8.8%.

These findings suggest that timing and dosage administration are the major areas where nursing students experience difficulties during medication administration.

Table 4.3 Respondents' Views on Medication Administration Errors

Variables	Yes	No
Medication error experience	52	28
I made medication error	44	35
Error should be reported	40	38
Discovered medication errors committed by others	47	33

The respondents were asked several questions regarding their experiences and perceptions related to medication administration errors. The results indicated that 52 respondents had experienced medication administration errors during clinical practice, while 28 respondents reported no experience with such errors. Furthermore, 44 respondents admitted that they had made medication errors themselves, whereas 35 respondents reported that they had not made any medication errors. Regarding reporting practices, 40 respondents agreed that medication administration errors should be reported, while 38 respondents did not support reporting errors.

Additionally, 47 respondents stated that they had discovered medication errors committed by other healthcare personnel or students, while 33 respondents had not observed such incidents.

DISCUSSION

This chapter focused on discussion of the current study with relevance to the literature. The present study assessed perceptions of medication administration errors and contributing factors among nursing students. The findings demonstrated that medication errors remain common in clinical settings, particularly among nursing students (Bam, Safowaa et al. 2021).

The basic aim of the study was to evaluate the Perception of Medication administration error among nursing students, Wrong-time error (37.5%) was identified as the most frequently encountered medication administration error. Similar findings were reported by (Tsegaye, Alem et al. 2020), who found that wrong-time error accounted for 38.6% of medication administration errors and was among the most frequently reported medication errors. The consistency between these findings suggests that timing-related medication errors remain a persistent challenge in clinical practice. Factors such as heavy workload, interruptions during medication rounds, staff shortages, and inadequate time management may contribute to the occurrence of these errors.

In the present study, omission errors accounted for 7.9% of all medication administration errors reported by the participants. In the comparison study where omission errors were reported at 10% (Ahmad, Angez et al. 2025) the finding still indicates that missed doses remain a significant concern in clinical practice. Omission errors can negatively affect patient outcomes because failure to administer prescribed medications on time may delay recovery, worsen the patient's condition, and increase the risk of complications.

The persistence of omission errors suggests that challenges such as workload, distractions, inadequate communication, and staff shortages may still contribute to missed medication doses. The findings of both studies highlight the need for continuous monitoring of medication administration practices and implementation of strategies to reduce omission errors. Measures such as double-checking medication schedules. Wrong dosage was another commonly encountered medication administration error among nursing students, accounting for 33.8% of the reported errors in the present study. Comparable findings were reported by (Mousa, Salameh et al. 2024) who also identified wrong-dosage errors among nursing students during clinical practice. Although the prevalence reported in their study was lower (2.29%), both studies highlight that dosage-related errors remain a significant concern in nursing education and clinical training. The higher percentage observed in the present study may be related to inadequate medication calculation

skills, insufficient clinical supervision, or differences in reporting practices among participants. These findings emphasize the importance of strengthening pharmacological knowledge and medication administration training among nursing students.

In the current study, prescribing error accounted for 10% of the reported medication errors. This finding indicates that prescribing-related mistakes continue to pose a challenge in clinical practice and may compromise patient safety. Similar findings were reported in another study, where prescribing errors accounted for 13.2% of medication-related errors (Ghaleb, Barber et al. 2010). The similarity between these findings suggests that prescribing errors are consistently present across different healthcare settings and remain an important contributor to medication administration problems. Such errors may result from illegible handwriting, incorrect prescriptions, communication gaps, or inadequate verification processes among healthcare professionals.

The study also found that more than half of the respondents had experienced medication errors, and many participants admitted that they had personally committed medication administration errors during clinical practice. Although respondents acknowledged the importance of reporting medication errors, reporting practices remained inconsistent. These findings are supported by previous studies, which reported that nursing students frequently experience and report medication administration errors during clinical training (Behmaneshpour, Khoshakhlagh et al. 2026). The consistency among these studies suggests that medication administration errors among nursing students are a widespread issue in clinical settings. Fear of punishment, lack of confidence, inadequate reporting systems, and limited organizational support may contribute to the underreporting of medication errors among nursing students.

5. CONCLUSION LIMITATIONS AND RECOMMENDATIONS

The study concluded that medication administration errors remain a significant concern among nursing students during clinical practice. The findings revealed that wrong-time and wrong-dosage errors were the most

frequently encountered medication administration errors among participants. Many nursing students reported experiencing or committing medication errors, highlighting the challenges faced during medication administration in clinical settings.

The study also identified several contributing factors to medication administration errors, including inadequate clinical experience, insufficient pharmacological knowledge, workload, distractions, poor supervision, and fear of reporting errors. Although many respondents recognized the importance of reporting medication errors, underreporting remained common due to fear of punishment and lack of confidence.

Overall, the findings emphasize the need for improved medication safety education, enhanced clinical supervision, simulation-based training, and supportive reporting systems within nursing education programs. Strengthening patient safety culture and providing continuous training for nursing students can help reduce medication administration errors and improve the quality of patient care.

Limitation

This study had several limitations that should be considered while interpreting the findings. First, the study was conducted only among final-year nursing students at Bahria Town School of Nursing, which limits the generalizability of the findings to other nursing institutions or healthcare settings.

Second, the study used a descriptive cross-sectional design, which collected relationships between medication administration errors and contributing factors.

Another limitation was the use of purposive sampling, which may have introduced selection bias and reduced the representativeness of the sample. In addition, the data were collected through self-reported responses, and participants may have underreported medication errors because of fear, embarrassment, or social desirability bias. Some students may also have had difficulty recalling previous medication error experiences accurately, leading to recall bias.

Furthermore, the study focused mainly on students' perceptions and experiences without

directly observing medication administration practices in clinical settings. Factors such as institutional policies, workload, staffing patterns, and supervision quality were not explored in depth. Finally, the relatively small sample size of 80 participants may limit the statistical strength of the findings.

Recommendations

- Further research and replication of the study is needed to generalize the results and outcomes of the study on a larger sample size.
- Educational training programs and hands-on practice workshops should be provided to nursing students to improve medication administration skills and patient safety practices.
- Guidelines related to safe medication administration and error reporting should be provided in clinical settings and nursing institutions.
- The study should be conducted in multi-center settings to assess perceptions of medication administration errors and contributing factors among nursing students in different clinical environments.

Reference

- Afaya, A., et al. (2021). "Improving patient safety through identifying barriers to reporting medication administration errors among nurses: an integrative review." *21*(1): 1156.
- Ahmad, W., et al. (2025). "Medication Administration Errors and Contributing Factors Among Nurses in Tertiary Hospitals; A Cross-sectional Study in Peshawar KP: <https://doi.org/10.5281/zenodo.17471897>." *4*(4): 276-302.
- Albalawi, A., et al. (2020). "Factors contributing to the patient safety culture in Saudi Arabia: a systematic review." *10*(10): e037875.
- Alrasheeday, A. M., et al. (2025). "Nursing students' perceptions of patient safety culture and barriers to reporting medication errors: A cross-sectional study." *146*: 106539.

- Aradhya, P. J., et al. (2023). "Assessment of medication safety incidents associated with high-alert medication use in intensive care setting: a clinical pharmacist approach." 27(12): 917.
- Bam, V., et al. (2021). "Nursing students' perception of medical errors: A cross-sectional study in a university." 8(6): 3152-3160.
- Behmaneshpour, F., et al. (2026). "The description and causes of medication errors and the factors related to error reporting from the point of view of nursing students at Alborz university of medical sciences, Karaj, Iran."
- Castaldo, A., et al. (2022). "Factors contributing to medication errors: A descriptive qualitative study of Italian nursing students." 118: 105511.
- Ghaleb, M. A., et al. (2010). "The incidence and nature of prescribing and medication administration errors in paediatric inpatients." 95(2): 113-118.
- Hammoudi, B. M., et al. (2018). "Factors associated with medication administration errors and why nurses fail to report them." 32(3): 1038-1046.
- Jang, H., et al. (2022). "Communication education regarding patient safety for registered nurses in acute hospital settings: A scoping review protocol." 12(2): e053217.
- Jones, J. R., et al. (2022). "Nursing students' risk perceptions related to medication administration error: A qualitative study." 58: 103274.
- Levett-Jones, T., et al. (2020). "A cross-sectional survey of nursing students' patient safety knowledge." 88: 104372.
- Mohammed, F., et al. (2025). "Nursing students' perception regarding medication errors and reporting barriers in Sudan: A cross-sectional study." 2(5): 231-237.
- Mousa, O., et al. (2024). "Examining nursing students' awareness of various medical errors during clinical internships to enhance patient safety: A multi-center cross-sectional study." 19(12): e0311681.
- Nemati-Vakilabad, R., et al. (2025). "Assessing self-perceptions related to safe medication management among nursing students: an analytical cross-sectional study in Iran." 24(1): 207.
- Nooriyan, A. A., et al. (2025). "Assessment of Nurses' Awareness, Attitudes, and Performance Regarding Medication Errors: A Cross-Sectional Study at Aliabad Teaching Hospital, Kabul." 6(3): 348-358.
- Ofosu, R. J. N. T. (2015). "Reducing nurse medicine administration errors." 111(20): 12-14.
- Shahzeydi, A., et al. (2024). "Comparison of the effects of medication error encouragement training and problem-based scenario on the medication safety competence and knowledge of nursing students: A quasi-experimental study." 81: 104171.
- Şimşek, P., et al. (2024). "Investigation of the relationship between nursing students' teamwork aptitude and their avoidance of medical error in surgical patient care." 7(2): 446-454.
- Sousa, V. T. D. S., et al. (2025). "Factors associated with medication administration by nursing students: A scoping review." 88: 104535.
- Stephen, L.-A., et al. (2020). "Psychological safety in simulation: Prelicensure nursing students' perceptions." 47: 25-31.
- Stolic, S., et al. (2022). "Medication errors by nursing students on clinical practice: An integrative review." 112: 105325.
- Tomas, N. and P. N. J. N. E. i. P. Fillipus (2024). "Perceptions of undergraduate nursing students regarding their competency in administering medications: A qualitative study." 79: 104098.
- Tsegaye, D., et al. (2020). "Medication administration errors and associated factors among nurses." 1621-1632.
- Vaismoradi, M., et al. (2020). "Nurses' adherence to patient safety principles: a systematic review." 17(6): 2028.

Woo, M. W. J. and W. J. N. O. Li (2020). "Nursing students' views and satisfaction of their clinical learning environment in Singapore." 7(6): 1909-1919.

Zarea, K., et al. (2018). "Iranian nurses' medication errors: A survey of the types, the causes, and the related factors." 8: 112-116.

