# PERCEPTIONS ON MEDICATION ADMINISTRATION ERRORS (MAES) AMONG NURSES AT THE PHILIPPINE ORTHOPEDIC CENTER (POC)

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## ABSTRACT

### BACKGROUND

Medication administration errors (MAEs) pose a significant threat to public health, resulting in patient harm, fatalities, and increased healthcare costs. Nurses, being central to the medication process, may be particularly susceptible to committing such errors due to the challenging work environment they operate in.

### OBJECTIVE

This study aimed to explore nurses' perceptions of MAEs and barriers to reporting using the Medication Administration Error Reporting Survey.

### METHODS

A quantitative, descriptive study employing a cross-sectional research design was conducted, with data analyzed using Stata 12. A total of 240 respondents participated, yielding an overall response rate of 79.17%.

### RESULTS

Key findings revealed that the most frequent reason for MAEs according to the nurses was physicians' medication orders are not legible (4.67 ± 1.21), unit staffing levels are inadequate (4.63 ± 1.45), and physicians' medication orders are not clear (4.48 ± 1.20), respectively. The most frequent reason for unreported MAEs was when med errors occur, nursing administration focuses on the individual rather than looking at the systems as a potential cause of the error (4.95 ± 4.33), nurses could be blamed if something happens to the patient as a result of the medication error (4.29 ± 1.48), and no positive feedback is given for passing medications correctly (4.22 ± 1.50), respectively. The highest prevalent non-IV related MAEs included wrong time of administration (M = 3.02 ± 2.37), medication administered after the order to discontinue has been written (M = 2.60 ± 2.11), and medication is omitted (M = 2.48 ± 1.97), all with 0-20% of reported non-IV MAEs. The highest prevalent IV related MAEs included wrong time of administration (M = 2.76 ± 2.29), medication administered after the order to discontinue has been written (M = 2.45 ± 2.01), and medication is omitted (M = 2.28 ± 1.95). More than half (n = 95, % = 54.29) of the respondents stated that 0-20% of all types of medication errors, including IV and non-IV medication errors are actually reported.

### CONCLUSION

This study sheds light on factors contributing to MAEs, reasons for underreporting, and the extent of reporting within the institution. The findings underscore the importance of addressing nurses' attitudes towards reporting systems and implementing preventive measures. Collaboration among physicians, pharmacists, and nurses is crucial in mitigating MAEs and ensuring patient safety.

### KEYWORDS

medication administration error, patient safety, nurses' perceptions

## INTRODUCTION

Despite the advances and developments made in the health care field, medication errors incurred and poor error reporting continue to be a major concern in health care facilities[1]. Despite its wide-ranging consequence, there is paucity of information on MAEs specifically in developing countries[2]. Studies related to medication errors are limited compared to other countries because most hospitals are reluctant to report medication errors. A few, if any, processes have been established to prevent MAEs, and barely any mechanisms have likewise been put in place to detect and report MAEs[2,3].

The previous study of the researcher about patient safety culture[4] in the same institution revealed that the nurses were feeling threatened if they report errors. The results showed that nurses were probably vulnerable to blame and punishment in the hospital. The hesitation of the nurses to report incidents may be associated with the pervasiveness of a punitive response to error and blame culture, being concerned with documentation of errors and fear that they will be held against them and that it will be kept in their individual employee record.

Medication errors have significant consequences for patient safety, and their detection is a main target in improving clinical practice errors, in order to prevent adverse events[5]. Analysis of these issues will aid the researchers to develop valuable recommendations that can enhance the existing policies and procedures in the organization and to design new programs that reduce risks of error occurrence to ensure better patient care practices and systems.

## RESEARCH QUESTIONS

This study specifically answered the following research questions:

1. What are the perceptions of the respondents on the following:
   1.1. Reasons for the occurrence of MAEs?
   1.2. Barriers to reporting MAEs?

2. What is the estimated percentage of specific type of IV-related and non-IV-related MAEs reported as experienced by the nurses?

3. What is the overall percentage of all types of medication errors, including IV and non-IV medication errors reported as experienced by nurses?

## OBJECTIVES OF THE STUDY

The primary goal of this study was to identify the nurses' perceptions on the occurrence of Medication Administration Errors (MAEs) and barriers to reporting using the Medication Administration Error (MAE) Reporting Survey.

Specifically, the study aimed to:

1. determine the perceptions of the respondents on the reasons for the occurrence of MAEs and barriers to reporting MAEs,

2. estimate the percentage of specific type of IV-related and non-IV-related MAEs reported as experienced by the nurses in the hospital, and

3. determine the overall percentage of all types of medication errors, including IV and non-IV medication errors reported as experienced by nurses.

## METHODS

**In this descriptive quantitative study, 240 nurses actively engaged in direct patient care for a minimum of three months were surveyed using a total enumeration approach. These nurses were specifically selected based on their involvement in administering various medications, both intravenous and non-intravenous in nature.** Higher-ranking nurses and those on leave were excluded from the study.

Data collection occurred in August-September 2019 after Ethics Review Board approval. Surveys were distributed to eligible nurses across hospital areas after obtaining informed consent. Completed questionnaires underwent validation and quality control by the investigator to ensure accuracy. Confidentiality was maintained, and informed consent was obtained from all participants.

Descriptive statistical analysis was done using Stata 12. Quantitative variables were described as mean, standard deviation (SD), frequency, and percentage. The means and standard deviations were calculated for individual items or subscales for the first two sections of the survey. Subscale values were calculated by adding the value for each item and dividing by the number of items in the subscale (i.e., calculating the mean of the items in the subscale). For the third section, the estimated percentage of errors reported were represented by the frequencies for each percent increment. Missing responses were excluded when displaying percentages of response to the survey items.

## RESULTS

The study achieved a response rate of 79.17% from 240 participating nurses. Table 1 outlines their demographic characteristics, revealing that a majority practiced primary nursing (88.95%), held a bachelor's degree (82.63%), and were at the Nurse II level (51.58%). On average, nurses had approximately 5.89 years of clinical experience. Most frequently administered both non-IV (73.16%) and IV medications (84.74%). Nurses were pulled out from their unit an average of 1.78 times per month and pulled into other units 1.59 times per month. The highest number of respondents came from Philhealth Ward (10.53%), followed by Male Service A-Ward and Male Service B-Ward (9.47% each), while the lowest number came from Male Traction Ward (2.11%).

Table 2 illustrates nurses' perceptions regarding the causes of MAEs. The primary reason identified was illegible physician medication orders (4.67 ± 1.21), followed by inadequate unit staffing levels (4.63 ± 1.45) and unclear physician orders (4.48 ± 1.20).

In Table 3, nurses' perceptions of unreported MAEs are detailed. The most prevalent reason cited was nursing administration's focus on individuals rather than systemic causes of errors (4.95 ± 4.33). Additionally, concerns about blame (4.29 ± 1.48) and lack of positive feedback for correct medication administration (4.22 ± 1.50) were highlighted.

Tables 4 and 5 outline perceived non-intravenous and intravenous related MAEs and the percentage of each type of medication error reported. Common non-IV errors include wrong timing of administration (3.02 ± 2.37), medication given post-discontinuation order (2.60 ± 2.11), and medication omission (2.48 ± 1.97), each reported with 0-20% frequency. Similarly, prevalent IV-related errors encompass wrong timing (2.76 ± 2.29), post-discontinuation administration (2.45 ± 2.01), and medication omission (2.28 ± 1.95).

Regarding error reporting, over half (n = 95, % = 54.29) indicated 0-20% of all medication errors, including IV and non-IV, were reported. Several (n = 39, % = 22.29) reported 21-30%, and a few (n = 13, % = 7.43) reported 31-40%. No respondents reported reporting rates of 91-99%.

Among 165 nurses offering suggestions, 20% emphasized compliance with policies and guidelines to prevent MAEs, followed by 18.18% advocating for adequate nurse staffing, and 12.73% urging clearer communication between physicians and nurses. From 37 nurses, 27.03% proposed enhancing the incident reporting system, 18.92% suggested forming an error monitoring team, and 13.51% recommended implementing a computer-based system for monitoring MAEs.

## DISCUSSION

The institution predominantly employs primary nursing (88.95%) over functional nursing (11.05%), emphasizing holistic patient care and nurse autonomy[6]. While primary nursing is deemed more patient-centered and supportive of nurses' professionalism, its impact on patient safety remains unexplored[7]. Thus, attributing medication administration errors to nursing care models requires further empirical investigation.

The majority (82.63%) of respondents hold bachelor's degrees, while only a few (17.37%) pursued master's degrees. Studies highlight the link between nursing education and safe patient care, including medication safety[8,9,10]. Continuing education, can reduce medication administration errors, with baccalaureate degree holders typically committing more errors[11]. While evidence suggests higher nursing education correlates with lower mortality risks, longitudinal studies are needed for a clearer understanding[12]. Despite encouragement from nursing management, many nurses, particularly the younger generation, opt for foreign employment, seeing it as an opportunity for professional growth and development due to socio-economic factors[13].

More than half (51.58%) of respondents held the Nurse II designation, followed closely by Nurse I (48.42%), with an average clinical experience of approximately 5.89 years. Nurse experience significantly influences medication errors, with longer-tenured nurses less prone to timing errors[14]. Experience is crucial in error detection and reporting[15]. However, it was found that there was no consistent link between experience and MAEs occurrence or reporting and was suggested that all nurses are susceptible regardless of tenure[12].

The study examined the frequency of administering non-IV and IV medications, with 84.74% of respondents reporting frequent IV medication administration and 73.16% reporting frequent non-IV medication administration. The findings suggest a higher likelihood of errors in IV medication administration due to the current system's reliance on medication cards prone to errors. Past research highlights IV medication errors contributing significantly to MAEs with serious health implications[16]. A substantial number of nurses have experienced MAEs during IV administrations indicating a need for preventive measures. Implementing medication administration flow charts and standardized guidelines, possibly through simulation training, could mitigate both non-IV and IV-related MAEs in clinical settings [16].

The study revealed that nurses were pulled out from their unit approximately 1.78 times per month, while they were pulled into other units about 1.59 times within the same period, indicating occasional staffing inadequacies in certain areas or shifts. Staffing is managed dynamically, but occasional understaffing is attributed to absenteeism, according to nursing management[7] highlighted a significant association between reasons for MAEs and non-reporting, linking it to floating between units, workload demands, interruptions in care continuity, and inconsistent nursing assignments. Such inconsistency increases error liability among float pool nurses, leading to frustration and dissatisfaction with the work environment[18].

The majority of respondents were from Philhealth Ward (10.53%), Male Service A-Ward (9.47%), and Male Service B-Ward (9.47%), which predominantly cater to post-surgical and orthopedic patients with complex conditions such as orthopedic infections requiring prolonged intravenous antibiotic therapy. This aligns with the increased frequency of IV medication administration reported by respondents highlighted the significant association between respondents' working area and the occurrence of MAEs.

The study identified the most common reasons for MAEs based on nurses' agreement ratings. The overall mean (3.58±1.35) indicated a "slight agreement" on these reasons. The five categories of reasons for MAEs occurrence are the following: (1) medication package reasons, (2) system reasons, (3) documentation-transcription reasons, (4) physician-nurse reasons, and (5) pharmacy reasons[11]. In this study, the most common reasons pertained to physician-nurse reasons: illegible and unclear physicians' medication orders and system reason: inadequate unit staffing levels.

Illegible physicians' medication orders have consistently been identified as a significant contributor to medication administration errors (MAEs) in various studies[19,20]. This issue often arises due to physicians being rushed or fatigued during their rounds, particularly in the early hours of the morning [21]. Physicians may have limited time to thoroughly discuss patient care

with nurses, further exacerbating the problem. To mitigate errors stemming from illegible handwriting, institutions have implemented strategies such as unit-dose drug dispensing systems and computerized medication ordering systems [22]. These measures aim to enhance clarity and reduce the risk of errors for nurses administering medications.

The second most common reason for medication administration errors (MAEs) in the institution is inadequate staffing levels, a finding consistent with studies conducted in foreign countries [2,16, 20]. Nurses identified insufficient staffing as the primary cause of MAEs, where it was correlated with medication errors[23]. Adequate staffing is crucial for patient safety, as understaffing increases nurses' workload and reduces time for essential tasks, elevating the risk of adverse events like falls and medication errors[24]. Improving staffing conditions through recruitment, adjusting work hours, or streamlining duties can enhance nursing staff well-being and overall healthcare quality[25].

Also, nurses also cited unclear physicians' orders as a significant contributor to MAEs, echoing findings from other studies[22]. To mitigate this risk, nurses should allocate time at the beginning of their shifts to review medication lists, consult patient records, and clarify any ambiguous orders[16].

Nurses play a crucial role in identifying and reporting medication administration errors (MAEs), holding themselves accountable and taking prompt corrective action to prevent complications. In our institution, MAEs must be reported using an incident report form (IR), which is then submitted to the responsible nurse supervisor for immediate action and subsequently reviewed by the Chief Nurse. However, in 2019, recorded MAEs were primarily detected through patient complaints or voluntary reporting by nurses and investigated by the Grievance and Counselling Committee. While voluntary reporting is encouraged, it likely underestimates the true occurrence of MAEs. Accurate data on MAEs is essential for problem identification and solution development, necessitating a supportive and non-punitive work environment. Effective communication and collaboration among healthcare providers, including open communication, error reporting, and team accountability, should be consistently practiced to enhance patient safety.

In this study, reasons for not reporting medication administration errors (MAEs) were categorized into fear, administrative, and disagreement over time-error definition[11]. Administrative reasons emerged as the most common, including instances where nursing administration focuses on individual accountability rather than systemic factors, fear of blame if patient harm

occurs due to a medication error, and lack of positive feedback for accurate medication administration. These findings highlight the need for a shift towards a systemic approach to error management and fostering a culture of support and recognition for error prevention and reporting.

The study reaffirmed findings from previous research indicating a prevalent culture of blame within the institution, hindering the reporting of medication administration errors (MAEs) [4]. Nurses identified punitive responses from management as the primary reason for underreporting MAEs. The current incident reporting policy instills fear in nurses, as those involved in errors face investigation by the Grievance and Counseling Committee, leading to stigmatization and damage to their professional reputation. Nurse managers must foster a supportive environment that encourages error reporting without fear of reprisal. Open reporting of errors is essential for learning and improvement, emphasizing the need for a blame-free culture in addressing medication errors effectively.

The second most common reason for unreported errors was nurses' fear of being blamed if a patient is harmed due to a medication error, aligning with findings from previous studies[19]. Nurses who report errors demonstrate honesty and integrity, facilitating the identification and resolution of recurring issues. Establishing a blame-free environment is crucial to ensure that reported errors are used as opportunities for learning and improvement.

The third most common reason for unreported errors was the absence of positive feedback for correctly administering medications. Regular and effective feedback is essential for formative evaluation, serving as a powerful tool for reinforcing positive behaviors and addressing negative ones[26]. Positive feedback, such as encouragement or recognition from nursing administration, can motivate nurses, enhance self-awareness, and promote a culture of feedback-seeking behavior. By rewarding good practices, nurses may feel more supported and confident in reporting errors, ultimately contributing to a safer healthcare environment.

Nurses reported the most common non-IV and IV-related medication administration errors (MAEs) as wrong timing, medication administered after discontinuation orders, and medication omission, with 0-20% of non-IV MAEs reported. The timing errors were attributed to perceived staffing inadequacy and pharmacy medication dispensing delays. Understaffing leads to time management challenges and increased workloads, contributing to the likelihood of medication administration errors.

Medication administration errors, such as administering medication after discontinuation orders or medication omission, are linked to the current medication management system. In this system, medications with standing orders are administered at set times, and nurses carry medication trays with patient information cards. When a medication is discontinued, nurses mark it as such but may fail to dispose of the corresponding card, leading to errors. Instances of medications being administered despite discontinuation orders or omitted due to lost cards have occurred, highlighting the system's flaws. The common non-IV MAEs were wrong time (28.6%), wrong dose (25.3%), and medication omission (24%), while IV MAEs included wrong rate (34%), wrong time (25.6%), and wrong dose (24.7%)[11]. Insufficient time for medication administration puts staff nurses at risk of errors[27]. Effective strategies like standardized charts and clinical pharmacy services have shown promise in improving medication safety16. Increased awareness among staff nurses of medication risks and errors is crucial for enhancing patient safety.

More than half of the nurses (54.29%) reported that only 0-20% of medication errors were being reported, indicating a significantly low reporting rate. This contradicted findings from the Patient Safety and Quality Committee, which identified a high incidence of medication errors during Nursing Audit reviews. The lack of reporting resulted in no action taken to mitigate the impact of most errors, compromising patient safety. This underreporting aligns with findings from other studies[28], indicating a widespread issue in healthcare settings. The high frequency of medication errors poses serious risks to patient health, highlighting the urgent need for improved reporting systems and interventions to enhance patient safety.

Overall, the rates of Medication Administration Errors (MAEs) are likely underestimated due to low reporting rates influenced by nurses' attitudes toward the reporting system. This trend is consistent with findings from a study in Saudi Arabia indicating underreporting of medication errors[29]. However, caution is needed when directly comparing findings across studies due to differences in subjects' characteristics, such as length of clinical practice, work area, and mechanisms for error reporting. These variations in working conditions and demographic factors suggest that risk factors for MAEs may differ between countries.

There exists a notable gap between nurses' perceived knowledge and their actual understanding of Medication Administration Errors (MAEs), underscoring the need for clear delineation of what constitutes such errors. Discrepancies may arise from differences in nurses' willingness to report MAEs, the availability of reporting systems, and the level of administrative support provided for reporting. Furthermore, insufficient documentation practices may contribute to underreporting, diminishing the likelihood of detecting and recording MAEs. Studies suggest that reported MAEs may represent only a fraction, potentially as low as 5%, of the actual occurrences[2].

The voluntary nature of self-reporting systems has been shown to significantly underestimate the true occurrence of Medication Administration Errors (MAEs), limiting the ability to accurately identify and address underlying problems[16,17]. A robust reporting system is essential for capturing accurate data on MAEs, enabling the development of effective solutions. Studies have highlighted the lack of such systems and the presence of fear as major barriers to reporting MAEs [2,11]. Implementing a user-friendly reporting system in a supportive environment can substantially enhance reporting rates, potentially increasing accuracy by up to fivefold. Therefore, the introduction of a simple and accessible reporting system is imperative to foster a culture of reporting and improve access to vital safety information.

Healthcare providers should recognize that reporting Medication Administration Errors (MAEs) without fear of penalties is crucial for enhancing patient safety, as errors often stem from organizational weaknesses. Promoting effective communication and collaboration among healthcare teams, including open channels for reporting errors and shared responsibility, is essential. Errors should be viewed as learning opportunities to understand their root causes and implement preventive measures to mitigate similar errors in the future.

## CONCLUSIONS

Medication errors pose significant risks to patient safety within healthcare systems. This study explored nurses' perceptions of factors contributing to medication administration errors (MAEs), barriers to reporting, and the extent of error reporting in healthcare institutions. Nurses ranked reasons for MAEs, including physicians' illegible medication orders, inadequate unit staffing levels, and unclear physicians' medication orders. Also, the ranking of reasons of unreported MAEs comprised of when medication errors occur, nursing administration focuses on the individual rather than looking at the systems as a potential cause of the error, nurses could be blamed if something happens to the patient because of the medication error, and no positive feedback is given for passing medications correctly. Findings highlighted nurses' perception of low MAE reporting rates, with wrong time of administration being a prevalent error. Over half of nurses reported minimal error reporting. Prevention of MAEs requires collective efforts from physicians, pharmacists, and nurses to ensure patient safety in clinical practice.

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## TABLES

**Table 1** General characteristics of respondents/demographic data of the nurses (N=190)

| Characteristics/Demographic data | Frequency | Percentage |
|---|---|---|
| **1.  model of nursing practice used** | | |
| 1.a. Functional | 21 | 11.05% |
| 2.b. Primary | 169 | 88.95% |
| **2.  highest level of nursing education completed** | | |
| 2.a. BSN | 157 | 82.63% |
| 2.b. Master's degree in Nursing | 33 | 17.37% |
| 2.c. Doctorate degree | 0 | 0 |
| **3. current position** | | |
| 3.a. Nurse I | 92 | 48.42% |
| 3.b. Nurse II | 98 | 51.58% |
| **4. length of experience in the hospital (months)** | Mean = 5.89 years | SD = 4.47 years |
| **5. frequency of administering non-IV medications** | | |
| 5.a. Never | 0 | 0 |
| 5.b. Rarely | 22 | 11.58% |
| 5.c. Occasionally | 29 | 15.26% |
| 5.d. Frequently | 139 | 73.16% |
| **6. frequency of administering IV medications** | | |
| 8.a. Never | 0 | 0 |
| 8.b. Rarely | 7 | 3.68% |
| 8.c. Occasionally | 22 | 11.58% |
| 8.d. Frequently | 161 | 84.74% |
| **7. average number of times nurse was pulled out from his/her unit per month.** | Mean = 1.78 times | SD = 2.59 times |
| **8. number of units nurse was pulled in to within a month** | Mean = 1.59 units | SD = 2.21 units |
| **9. Nursing unit to which you belong** | | |
| 9.a. Emergency Room | 17 | 8.95% |
| 9.b. Emergency Ward | 13 | 6.84% |
| 9.c. Children's Ward | 9 | 4.74% |
| 9.d. Operating Room | 11 | 5.79% |
| 9.e. Post Anesthesia Care Unit | 6 | 3.16% |
| 9.f Male Traction Ward | 4 | 2.11% |
| 9.g. Male Service A-Ward | 18 | 9.47% |
| 9.h Observation Unit | 8 | 4.21% |
| 9.i. North East ward | 12 | 6.32% |
| 9.j. Spinal Ward | 16 | 8.42% |
| 9.k. Rehabilitation Ward | 5 | 2.63% |
| 9.l. Male Service B Ward | 18 | 9.47% |
| 9.m. Female Service Ward | 15 | 7.89% |
| 9.n. Pay 3rd Ward | 12 | 6.32% |
| 9.o. Philhealth Ward | 20 | 10.53% |
| 9.p. Pay4East Ward | 6 | 3.16% |
| 9.q. Others | 0 | 0.00% |

**Table 2** Reasons for the occurrence of MAEs (N = 190)

| RANK | SURVEY ITEMS AND # | MEAN | SD (±) | VERBAL INTERPRETATION |
|---|---|---|---|---|
| 1 | A4. Physicians' medication orders are not legible. | 4.67 | 1.21 | moderately agree |
| 2 | A23. Unit staffing levels are inadequate. | 4.63 | 1.44 | moderately agree |
| 3 | A5. Physicians' medication orders are not clear. | 4.48 | 1.20 | moderately agree |
| 4 | A3. The packaging of many medications is similar. | 4.27 | 1.31 | slightly agree |
| 5 | A2. Different medications look alike. | 4.24 | 1.32 | slightly agree |
| 6 | A8. Verbal or telephone orders are used instead of written orders. | 4.18 | 1.33 | slightly agree |
| 7 | A7. Abbreviations are used instead of writing the orders out completely. | 4.15 | 1.25 | slightly agree |
| 8 | A15. Many patients are on the same or similar medications. | 4.08 | 1.31 | slightly agree |
| 9 | A16. Unit staff do not receive enough in-services on new medications. | 4.04 | 1.19 | slightly agree |
| 10 | A19. Nurses get pulled between teams and from other units. | 4.04 | 1.51 | slightly agree |
| 11 | A13. Frequent substitution of drugs (i.e., cheaper generic for brand names). | 3.76 | 1.47 | slightly agree |
| 12 | A6. Physicians change orders frequently. | 3.74 | 1.19 | slightly agree |
| 13 | A24. All medications for one team of patients cannot be passed within an accepted time frame. | 3.70 | 1.38 | slightly agree |
| 14 | A27. Equipment malfunctions or is not set correctly (e.g., IV pump, IV infusion set, soluset, nebulizer set) | 3.65 | 1.46 | slightly agree |
| 15 | A14. Poor communication between nurses and physicians. | 3.61 | 1.31 | slightly agree |
| 16 | A1. The names of many medications are similar. | 3.57 | 1.33 | slightly agree |
| 17 | A11. Pharmacy does not label the med correctly. | 3.54 | 1.47 | slightly agree |
| 18 | A22. Nurses are interrupted while administering medications to perform other duties. | 3.52 | 1.56 | slightly agree |
| 19 | A17. On this unit, there is no easy way to look up information on medications. | 3.27 | 1.41 | slightly disagree |
| 20 | A26. Errors are made in the medication card, medication sheet and Kardex. | 3.16 | 1.41 | slightly disagree |
| 21 | A29. Patients are off the ward for other care. | 3.08 | 1.30 | slightly disagree |
| 22 | A10. Pharmacy does not prepare the correct med to be issued to the requesting nursing unit. | 3.04 | 1.25 | slightly disagree |
| 23 | A25. Medication orders are not transcribed to the medication card, medication sheet and Kardex correctly. | 2.99 | 1.45 | slightly disagree |
| 24 | A9. Pharmacy dispenses incorrect medicine to this unit. | 2.98 | 1.25 | slightly disagree |
| 25 | A20. When scheduled medications are delayed, nurses do not communicate the time when the next dose is due. | 2.93 | 1.43 | slightly disagree |
| 26 | A28. Nurse is unaware of a known allergy. | 2.83 | 1.42 | slightly disagree |
| 27 | A12. Pharmacists are not available 24 hours a day. | 2.65 | 1.37 | slightly disagree |
| 28 | A18. Nurses on this unit have limited knowledge about medications. | 2.55 | 1.33 | slightly disagree |
| 29 | A21. Nurses on this unit do not adhere to the approved medication administration procedure. | 2.52 | 1.32 | moderately disagree |
| | **Overall** | **3.58** | **1.35** | **slightly agree** |

LEGEND:

| Mean | Verbal Interpretation |
|---|---|
| 1 - 1.833 | strongly disagree |
| 1.834 - 2.666 | moderately disagree |
| 2.667 - 3.499 | slightly disagree |
| 3.500-4.332 | slightly agree |
| 4.333 - 5.165 | moderately agree |
| 5.166 - 6.00 | strongly agree |

**Table 3** Reasons for unreported MAEs (N = 190)

| RANK | SURVEY ITEMS AND # | MEAN | SD (±) | VERBAL INTERPRETATION |
|------|--------------------|------|--------|------------------------|
| 1 | B. 45.   When med errors occur, nursing administration focuses on the individual rather than looking at the systems as a potential cause of the error. | 4.66 | 1.35 | moderately agree |
| 2 | B. 42.   Nurses could be blamed if something happens to the patient as a result of the medication error. | 4.29 | 1.48 | slightly agree |
| 3 | B. 43.   No positive feedback is given for passing medications correctly. | 4.22 | 1.49 | slightly agree |
| 4 | B. 37.     The patient or family might develop a negative attitude toward the nurse, or may sue the nurse if a medication error is reported. | 4.17 | 1.54 | slightly agree |
| 5 | B. 44.   Too much emphasis is placed on med errors as a measure of the quality of nursing care provided. | 4.11 | 1.39 | slightly agree |
| 6 | B. 40.     Nurses fear adverse consequences from reporting medication errors. | 3.93 | 1.43 | slightly agree |
| 7 | B. 41.  The response by nursing administration does not match the severity of the error. | 3.89 | 1.37 | slightly agree |
| 8 | B. 39.     Nurses are afraid the physician will reprimand them for the medication error. | 3.68 | 1.54 | slightly agree |
| 9 | B. 36.     Nurses believe that other nurses will think they are incompetent if they make medication errors. | 3.47 | 1.62 | slightly disagree |
| 10 | B. 38.     The expectation that medications be given exactly as ordered is unrealistic. | 3.46 | 1.50 | slightly disagree |
| 11 | B. 32.     Filling out an incident report for a medication error takes too much time. | 3.44 | 1.54 | slightly disagree |
| 12 | B. 34.     Medication error is not clearly defined. | 3.15 | 1.45 | slightly disagree |
| 13 | B. 33.     Contacting the physician about a medication error takes too much time. | 3.07 | 1.41 | slightly disagree |
| 14 | B. 35.   Nurses may not think the error is important enough to be reported. | 2.86 | 1.51 | slightly disagree |
| 15 | B.30.   Nurses do not agree with hospital's definition of a medication error. | 2.84 | 1.37 | slightly disagree |
| 16 | B 31.     Nurses do not recognize an error occurred. | 2.73 | 1.36 | slightly disagree |
| | **Overall** | **3.62** | **1.46** | **slightly agree** |

LEGEND:
| **Mean** | **Verbal Interpretation** |
|----------|---------------------------|
| 1 - 1.833 | strongly disagree |
| 1.834 - 2.666 | moderately disagree |
| 2.667 - 3.499 | slightly disagree |
| 3.500-4.332 | slightly agree |
| 4.333 - 5.165 | moderately agree |
| 5.166 - 6.00 | strongly agree |

**Table 4** Type of error reported for non-IV medication (N = 190)

| Types of Non-IV Medication Errors | 0-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-99 | 100 | Mean ± SD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C46.Wrong route of administration | 116 (61.70) | 24 (12.77) | 13 (6.91) | 9 (4.79) | 12 (6.38) | 7 (3.72) | 2 (1.06) | 3 (1.60) | 1 (0.53) | 1 (0.53) | 2.12 ± 1.87 |
| C47.Wrong time of administration | 71 (37.77) | 38 (20.21) | 18 (9.57) | 11 (5.85) | 22 (11.70) | 7 (3.72) | 6 (3.19) | 9 (4.79) | 4 (2.13) | 2 (1.06) | 3.02 ± 2.37 |
| C48.Wrong patient | 123 (65.08) | 23 (12.17) | 15 (7.94) | 8 (4.23) | 9 (4.76) | 4 (2.12) | 4 (2.12) | 1 (0.53) | 1 (0.53) | 1 (0.53) | 1.96 ± 1.73 |
| C49.Wrong dose | 98 (52.13) | 38 (20.21) | 18 (9.57) | 11 (5.85) | 12 (6.38) | 3 (1.60) | 4 (2.13) | 3 (1.60) | 0 | 1 (0.53) | 2.20 ± 1.76 |
| C50.Wrong drug | 114 (60.32) | 36 (19.05) | 10 (5.29) | 4 (2.12) | 9 (4.76) | 5 (2.65) | 3 (1.59) | 5 (2.65) | 2 (1.06) | 1 (0.53) | 2.10 ± 1.95 |
| C51.Medication is omitted | 85 (44.97) | 42 (22.22) | 17 (8.99) | 15 (7.94) | 15 (7.94) | 1 (0.53) | 8 (4.23) | 4 (2.12) | 1 (0.53) | 1 (0.53) | 2.48 ± 1.97 |
| C52.Medication is given, but has not been ordered by the physician | 122 (65.24) | 26 (13.90) | 14 (7.49) | 8 (4.28) | 9 (4.81) | 1 (0.53) | 6 (3.21) | 0 | 1 (0.53) | 0 | 1.87 ± 1.57 |
| C53.Medication administered after the order to discontinue has been written | 82 (43.62) | 37 (19.68) | 24 (12.77) | 16 (8.51) | 11 (5.85) | 1 (0.53) | 7 (3.72) | 5 (2.66) | 4 (2.13) | 1 (0.53) | 2.60±2.11 |
| C54.Given to patient with a known allergy | 127 (67.55) | 25 (13.30) | 12 (6.38) | 6 (3.19) | 11 (5.85) | 2 (1.06) | 1 (0.53) | 2 (1.06) | 2 (1.06) | 0 | 1.84±1.61 |

**Table 5** Type of error reported for IV medication (N = 190)

| Types of Non-IV Medication Errors | 0-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-99 | 100 | Mean ± SD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C55.Wrong method of administration | 131 (69.31) | 20 (10.58) | 8 (4.23) | 7 (3.70) | 13 (6.88) | 4 (2.12) | 2 (1.06) | 3 (1.60) | 1 (0.53) | 1 (0.53) | 1.91±1.76 |
| C56.Wrong time of administration | 78 (41.27) | 44 (23.28) | 16 (8.47) | 8 (4.23) | 22 (11.64) | 4 (2.12) | 5 (2.66) | 4 (2.12) | 5 (2.66) | 3 (1.59) | 2.76±2.29 |
| C57.Wrong patient | 128 (67.72) | 28 (14.81) | 10 (5.29) | 4 (2.12) | 9 (4.81) | 4 (2.12) | 1 (0.53) | 2 (1.06) | 2 (1.06) | 1 (0.53) | 1.85±1.72 |
| C58.Wrong dose | 107 (56.61) | 37 (19.58) | 14 (7.41) | 10 (5.29) | 11 (5.82) | 3 (1.59) | 4 (2.12) | 1 (0.53) | 1 (0.53) | 1 (0.53) | 2.07±1.72 |
| C59.Wrong drug | 124 (65.61) | 32 (16.93) | 9 (4.81) | 8 (4.23) | 6 (3.19) | 2 (1.06) | 2 (1.06) | 3 (1.59) | 2 (1.06) | 1 (0.53) | 1.88±1.74 |
| **Types of Non-IV Medication Errors** | **0-20** | **21-30** | **31-40** | **41-50** | **51-60** | **61-70** | **71-80** | **81-90** | **91-99** | **100** | **Mean ± SD** |
| C60. Medication is omitted | 98 (52.13) | 39 (20.74) | 17 (9.04) | 6 (3.19) | 11 (5.85) | 5 (2.66) | 6 (3.19) | 4 (2.12) | 1 (0.53) | 1 (0.53) | 2.28±1.95 |
| C61. Medication is given, but has not been ordered by the physician | 128 (67.72) | 27 (14.36) | 5 (2.66) | 10 (5.29) | 8 (4.23) | 1 (0.53) | 5 (2.66) | 2 (1.06) | 1 (0.53) | 1 (0.53) | 1.88±1.74 |
| C62. Medication administered after the order to discontinue has been written | 88 (46.56) | 41 (21.69) | 17 (8.99) | 15 (7.94) | 11 (5.82) | 4 (2.12) | 6 (3.17) | 4 (2.12) | 1 (0.53) | 2 (1.06) | 2.45±2.01 |
| C.63. Given to patient with a known allergy | 132 (69.84) | 27 (14.36) | 6 (3.17) | 6 (3.17) | 8 (4.23) | 3 (1.59) | 2 (1.06) | 3 (1.59) | 1 (0.53) | 1 (0.53) | 1.81±1.70 |
| C64. Wrong fluid | 116 (61.38) | 39 (20.63) | 6 (3.17) | 10 (5.29) | 7 (3.70) | 5 (2.65) | 2 (1.06) | 2 (1.06) | 1 (0.53) | 1 (0.53) | 1.94±1.69 |
| C65. Wrong rate of administration | 102 (54.26) | 32 (17.02) | 15 (7.98) | 10 (5.32) | 14 (7.45) | 7 (3.72) | 4 (2.13) | 2 (1.06) | 1 (0.53) | 1 (0.53) | 2.27±1.89 |