CODEN [USA]: IAJPBB ISSN : 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
SJIF Impact Factor: 7.187
https://doi.org/10.5281/zenodo.18847517

Available online at: http://www.iajps.com Review Article

PERCEPTION & CONTRIBUTING FACTORS TO MEDICATION ADMINISTRATION & DISTRIBUTION ERRORS AMONG NURSES

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Abstract:

Introduction: *Unsafe medication practices are the leading causes of avoidable patient harm in healthcare systems across the world. The largest proportion of which occurs during medication administration. Nurses play a significant role in the occurrence as well as preventions of medication administration errors.*

Objective: *To assess perception & contributing factors to medication administration & distribution errors among nurses.*
Materials & methods: *It was descriptive, quantitative, cross-sectional study in nature in which 48 nursing staff included. Self-administered questionnaires were used to collect the data from the participants.*
Results: *There were total 48 nurses having age range 25 years to 36 years old included in the study. In the sample of 48 participants, 58.33% reported that difficulty in hand written orders may cause medication errors; 77.09% participants revealed that confusion about different drugs with similar names also can cause medication administration and distribution errors 14.58% participants reported that low level of perception about medication errors; 66.67% said moderate level and remaining 18.75% reported high level of perception about medication errors.*

Conclusion: *Consequently, moderate level of perception regarding medication administration and medication distribution errors found among most of the respondents. Use of abbreviation, confusion about different drugs with similar names, increase patient to nurse ratio, poor communication between nurse and physician, long working hours, night shift, inadequate unit staff and lack of training regarding prevention of medication errors were the main factors contributing medication administration and distribution errors.*

Keywords: *Perception, medication administration, medication errors, nurses, etc.*

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Please cite this article in press Yasmin Sadiq et al., Perception & Contributing Factors To Medication Administration & Distribution Errors Among Nurses., Indo Am. J. P. Sci, 2026; 13(03).

INTRODUCTION:

Medication errors were multidisciplinary in nature and included prescribing, dispensing and administration errors that result in incorrect medications, administration routes, doses, inappropriate continuation of medications, omission of doses or administering medications to patients despite knowing that they were allergic to the medication **(Flynn L et al., 2012)**. Nurses were intimately involved in and ultimately responsible for the delivery of medication **(Carlton G, Blegen MA., 2006)**.

Medication errors as defined by National Coordinating Council for Medication Error Reporting and Prevention **(NCCMERP, 2015)**, are any form of preventable error that may cause or lead to inappropriate medication use or patient harm while the medication was in the control of the healthcare professional, patient, or consumer. It can occur during ordering, transcription and dispensing **(Stratton, Blegen, Pepper, &Vaughn, 2004)**.

The medication administration process was a daily component of nursing practice and was often viewed as a routine and basic nursing task. Nurses spend up to 40% of their work time on medication administration **(Armitage G, Knapman H., 2003)**. However, nurses often practice under suboptimal organizational conditions in terms of staffing, organization of work and the work environment **(Dubois CA et al., 20-13)**.

Medication errors were classified into three categories of personal, contextual and knowledge- based factors, personal factors include, stress, tiredness, confusion, the physician prescription, errors of orders implementation, inadequate attention to details, lack of job- satisfaction, unpleasant workplace, decreased sense of commitment and career conscience and so on **(Hend and Barber, 2000)**.

Some examples of contextual factors were the lack of competent and skilled staffs, heavy overtime work, long work days, a crowded ward, necessity of intensive cares, and etc., and some of the knowledge- based causes include, inadequate pharmaceutical knowledge and experience, no awareness about patients‘ and drug mathematical calculations **(Britten N., 2009)**. Medication administration error was one of the most common errors in the medication error process and occurs when a discrepancy occurred between the drugs received by the patient and the drug intended by the prescriber **(Flynn et al., 2012)**.

Medication administration was defined as preparing, giving, evaluating the effectiveness of prescription and nonprescription medications. It was also one of the most important, complexes, yet most vital processes of nursing care which required the right knowledge and function of a competent nurse **(Gorgich et al., 2016)**. Generally, the essential part of every nurse's training was committing to memory and practice the “Five rights” checklist: (1) the right drug,(2) the right dose, (3) the right route, (4) the right time, and (5) the right patient **(Benjamin, 2003)**.

Despite this, medication administration errors still persist making its effect to have direct consequences on the patients as well as indirect consequences on the nurses. The direct consequences on the patient included patient harm, as well as increased healthcare costs while the indirect consequences on the nurses included harm to nurses in terms of professional and individual status, self-assurance, and practice **(Mayo & Duncan, 2004)**. A lot of factors had been deduced to trigger the occurrence of medication administration errors, as seen in a systematic review using quantitative and qualitative evidence to find causes of medication administration errors **(Keers et al., 2013)**.

However, most errors affecting hospitalized patients occurred at the bedside, and it happens when a dose of medication is incorrectly administered **(Rodriguez-Gonzalez et al., 2012)**. Studies on medication administration errors rates and safety mostly carried out in developed countries has varying reported incidences of 3.3%, 10%, 19.5% and 22.2% **(Yung et al., 2016)**, while studies carried out in developing countries have found very high medication administration rates of 56.4% **(Feleke, Mulatu, & Yesmaw, 2015)** and 94% **(Blignaut et al., 2017)**.

A study conducted in which nurses discovered that medication errors could occur when there was confusion between two drugs with similar names **(Connolly, 2007)**. It was reported that a high volume of similar drugs to be administered to patients tend to increases nurses’ task in the medication administration process ranging from finding, identifying and verifying medicines **(Feleke et al., 2015)**. Errors initiated during medication dispensing and administration were mostly associated with performance deficits as a result of increased patient to nurse staffing ratio leading to accidental slips and memory lapses due to excess workload **(Gorgich et al., 2016)**

It was indicated that using abbreviated drug names was the most significant cause of medication error (48.93%) **(Seyyedeh et al., 2013)**, Illegible handwriting of physicians and complex orders were found to be among the conditions causing

medication errors. On the contrast, in the study 36.7% respondents were strongly disagreed that patient with similar names could contribute to medication administration errors **(Jones & Treiber, 2010)**. In view of the above, current study undertaken at Children's Hospital, Lahore regarding perception & contributing factors to medication administration & distribution errors among nurses.

1.1. Research objectives

⊙To assess the level of perception among nurses regarding medication administration and distribution.

⊙To identify main contributing factors causing medication errors among nurses.

1.2. Research questions

⊙What was the level of perception among nurses regarding medication administration and distribution among nurses of Children's Hospital, Lahore?

⊙What was the main contributing factors causing medication errors among nurses of Children's Hospital, Lahore?

1.3. Significance of the study

The researcher interested to investigate the level of perception of nurses regarding medication administration and distribution and prime factors causing those type of medication errors. As well as this study will determine how medication errors may be reduced among nurses for better patient care. The findings of the current study may help explore the severity of the problem, and to identify relevant recommendations help in the problem intervention. This study will definitely contribute to the literature and force nurses to administer further researches regarding minimizing medication errors.

1.4. Definition of key terms

⊙Perception

The way in which something is regarded, understood or interpreted.

⊙Contributing factors

Contributing factors are the practices and factors that lead to outbreaks. In an outbreak, contributing factors are the "how" and root causes are the "why". Identifying contributing factors in foodborne illness outbreaks can help stop them and prevent them in the future.

⊙Medical administration

Medical administration is administration or management utilizing the medical and clinical knowledge, skill and judgment of a registered medical practitioner and capable of affecting the health and safety of the public or any person.

⊙Medical error

A medical error is a preventable adverse effect of care, whether or not it is evident or harmful to the patient.

METHODOLOGY:

3.1. Study design:

A cross-sectional study design.

3.2. Study setting:

The study was conducted at Children's Hospital, Lahore with collaboration of Post Graduate College of Nursing, Lahore.

3.3. Duration of study:

The study completed in 3 months (from 07-01-2023 to 07-03-2023).

3.4. Study Population:

Nurses working at Children's Hospital, Lahore.

3.5. Sample size & sampling

In the population of 55 nurses following sample was drawn for the study by using listed below formulae:

N= Population = 55; n= Sample Size; E= Margin error = 0.05

$$n = \frac{N}{1 + N(E)^2}$$

$$n = \frac{55}{1 + 55(0.05)^2}$$

$$n = \frac{55}{1 + 55(0.0025)}$$

$$n = \frac{55}{1 + 0.1375}$$

$$n = \frac{55}{1.1375}$$

$$n = 48.35$$

Thus a more suitable sample of n= 48 considered for the study.

3.6. Sampling Technique:

Convenient sampling technique.

3.7. Eligibility Criteria:

Inclusion Criteria:

- Nurses having age range 25 years to 36 years old included in the study.
- Nurses having experience 3 to 15 years included in the study.

Exclusion Criteria:

- Nurses less than 25 years and above than 36 years excluded from the study.
- Nurses having experience less than 3 years and above than 15 years excluded from the study.

3.8. Study Instruments

Self-administered questionnaire were used to collect the data from study participants

3.9. Ethical consideration

This study was approved by the ethical review committee of the institution and performed in accordance with the principles of Committee. To ensure their voluntary participation, inform consent was obtained from all the participants. All participants had autonomy to withdraw their consent at any time during the stipulated period of the study.

3.10. Data Analysis

Data was depicted in MS Excel and presented in the form of tables and graphs. Its accuracy can be

checked via percentages and frequencies shown in the tables and graphs.

RESULTS:

A descriptive, cross-sectional study administered at Children's Hospital, Lahore regarding perception and contributing factors to medication administration & distribution errors among nurses in which 48 nurses included. There were 27.08% participants belonged to an age group of (25-27) years; 33.33% were from (28-30) years; 20.83% were between (31-33) years and remaining 18.75% participants belonged to age group (34-36) years old as mentioned in the table no. 4.1. & figure no. 4.1.

Table 4.1. Demographic data of study participants (n=48)

Characteristics of study participants	Frequency (f)	Percentage (%)
Age (Years)		
25-27 years	13	27.08
28-30 years	16	33.33
31-33 years	10	20.83
34-36 years	9	18.75
Total	**48**	**100.00**
Marital status		
Single	29	60.42
Married	19	39.58
Total	**48**	**100.00**
Educational status		
BSC Nursing	33	68.75
Diploma	12	25.00
Others	3	6.25
Total	**48**	**100.00**
Professional experience		
3-5 years	13	27.08
6-8 years	11	22.92
9-12 years	12	25.00
13-15 years	12	25.00
Total	**48**	**100.00**
Working shift		
Morning	8	16.67
Evening	22	45.83
Night	18	37.50
Total	**48**	**100.00**
Took Training of medication administration errors		

Yes	21	43.75
No	27	56.25
Total	**48**	**100.00**
Report error		
Yes	6	12.50
No	42	87.50
Total	**48**	**100.00**

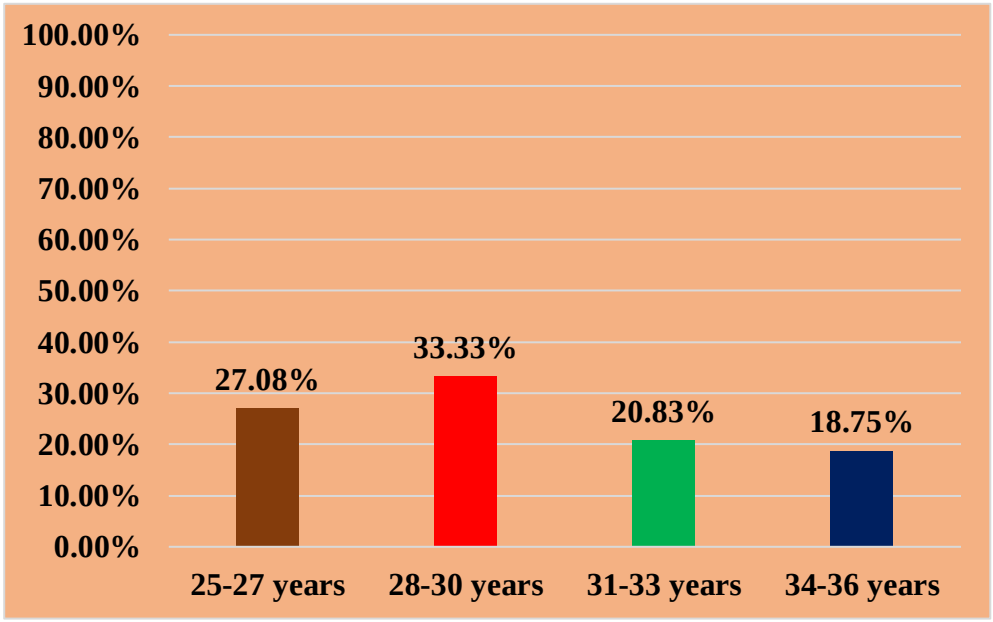

Figure no. 4.1. Age of study participants

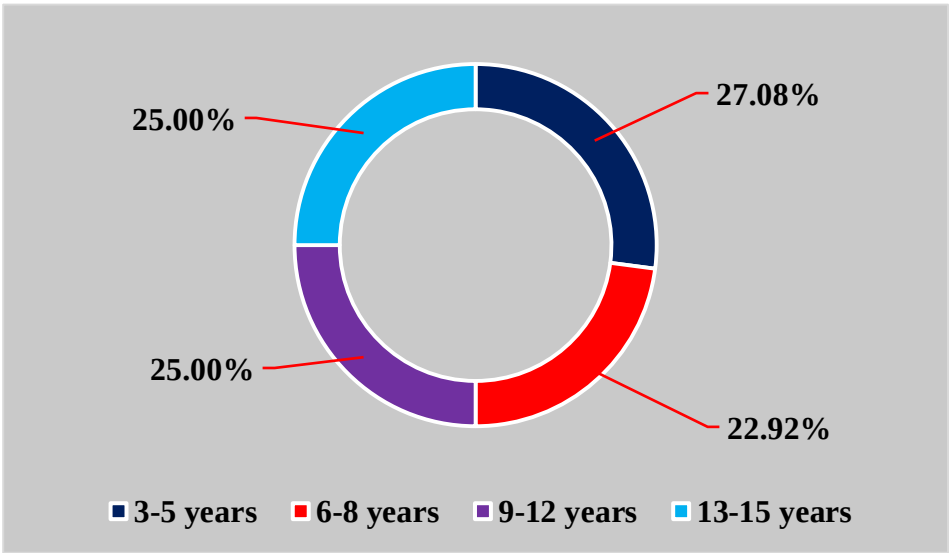

Figure no. 4.2. Professional experience of study participants

Total 48 participants recruited for the study and as per their professional experience, 27.08% participants having 3 to 5 years experience; 22.92% had 6 to 8 years; 25% having 9 to 12 years and rest of study participants having 13 to 15 years experience as depicted in the table no. 4.1. & figure no. 4.2.

Table 4.2. Perception & contributing factors to medication administration and distribution errors among nurses (n=48)

Sr. #.	Questions	Responses				
		Strongly agree (f) %	Agree (f) %	Undecided (f) %	Disagree (f) %	Strongly disagree (f) %
1	Difficulty in reading handwritten orders.	21 (43.75%)	7 (14.58%)	6 (12.50%)	7 (14.58%)	7 (14.58%)
2	Use of abbreviations.	8 (16.67%)	32 (66.67%)	1 (2.08%)	3 (6.25%)	4 (8.33%)
3	Confusion about different drugs with similar names.	29 (60.42%)	8 (16.67%)	2 (4.17%)	4 (8.33%)	5 (10.42%)
4	Hectic and stressful environment.	15 (31.25%)	25 (52.08%)	1 (2.08%)	4 (8.33%)	3 (6.25%)
5	Poor communication between the medication provider and the patient.	33 (68.75%)	11 (22.92%)	0 (0%)	2 (4.17%)	2 (4.17%)
6	Confusion about different patients with similar names.	19 (39.58%)	17 (35.42%)	3 (6.25%)	5 (10.42%)	4 (8.33%)
7	Diverse patients, unfamiliar settings, time pressures.	27 (56.25%)	6 (12.50%)	2 (4.17%)	3 (6.25%)	10 (20.83%)
8	Increase patient to nurse staffing ratio.	35 (72.92%)	4 (8.33%)	1 (2.08%)	4 (8.33%)	4 (8.33%)
9	Slips and memory lapses.	11 (22.92%)	26 (54.17%)	4 (8.33%)	2 (4.17%)	5 (10.42%)
10	Faulty dose checking.	25 (52.08%)	16 (33.33%)	2 (4.17%)	3 (6.25%)	2 (4.17%)
11	Physician’s medication orders are not legible and difficult to read.	37 (77.08%)	4 (8.33%)	5 (10.42%)	1 (2.08%)	1 (2.08%)
12	Verbal orders are used instead of written orders. .	21 (43.75%)	22 (45.83%)	2 (4.17%)	1 (2.08%)	2 (4.17%)
13	The names of many medications are similar and look alike.	34 (70.83%)	10 (20.83%)	1 (2.08%)	2 (4.17%)	1 (2.08%)
14	The medication labels/ packaging are of poor quality.	12 (25.00%)	15 (31.25%)	5 (10.42%)	10 (20.83%)	6 (12.50%)
15	Poor communication between nurses and physicians.	38 (79.17%)	5 (10.42%)	2 (4.17%)	2 (4.17%)	1 (2.08%)
16	Physicians change order frequently.	6 (12.50%)	34 (70.83%)	1 (2.08%)	6 (12.50%)	1 (2.08%)
17	Pharmacy dose not prepare or label the medication correctly.	42 (87.50%)	2 (4.17%)	2 (4.17%)	1 (2.08%)	1 (2.08%)
18	Unit staffing level are inadequate.	27 (56.25%)	19 (39.58%)	2 (4.17%)	0 (0%)	0 (0%)

19	Long shift/over time.	40 (83.33%)	3 (6.25%)	1 (2.08%)	2 (4.17%)	2 (4.17%)
20	The nurse adjusts an infusion device incorrectly.	12 (25.00%)	34 (70.83%)	0 (0%)	1 (2.08%)	1 (2.08%)
21	Lack of adequate information about the patient and medication.	26 (54.17%)	16 (33.33%)	2 (4.17%)	2 (4.17%)	2 (4.17%)
22	Nurses administer medication prepared by another nurse.	31 (64.58%)	14 (29.17%)	1 (2.08%)	1 (2.08%)	1 (2.08%)
23	All medications for one team of patients cannot be passed within an accepted time frame. .	25 (52.08%)	15 (31.25%)	2 (4.17%)	3 (6.25%)	3 (6.25%)
24	Equipment malfunctions or is not set correctly (e.g. IV pump).	6 (12.50%)	38 (79.17%)	1 (2.08%)	2 (4.17%)	1 (2.08%)

In the sample of 48 participants, 58.33% reported that difficulty in hand written orders may cause medication errors; 29.16% were disagreed and 12.50% were confused about the statement. 77.09% participants revealed that confusion about different drugs with similar names also can cause medication administration and distribution errors among nurses while 18.75% were disagreed and only 4.17% gave neutral response as indicated in the table no. 4.2.

In the population of 55 respondents, only 48 chose for the study out of which 81.25% reported that increase nurse to patient ratio also may cause mediation errors; 16.66% denied and rest of 2.08% gave neutral response. 89.59% participants said that poor communication between nurses and physicians also a reason of medication errors among nurses; 6.25% were disagreed and remaining 4.17% gave unsatisfactory response as shown in the table no. 4.2.

There were total 48 participants included in the study, out of which 95.83% agreed that inadequate unit staffing level also may cause medication errors among nurses and remaining 4.17% were disagreed. 83.33% participants reported that all medication for one team of patients cannot be passed within accepted time frame also a reason of medication errors among nurses and 12.5% were disagreed and remaining 4.17% gave neutral response as shown in the table no. 4.2. 14.58% participants reported that low level of perception about medication errors; 66.67% said moderate level and remaining 18.75% reported high level of perception about medication errors as displayed in the figure no. 4.3.

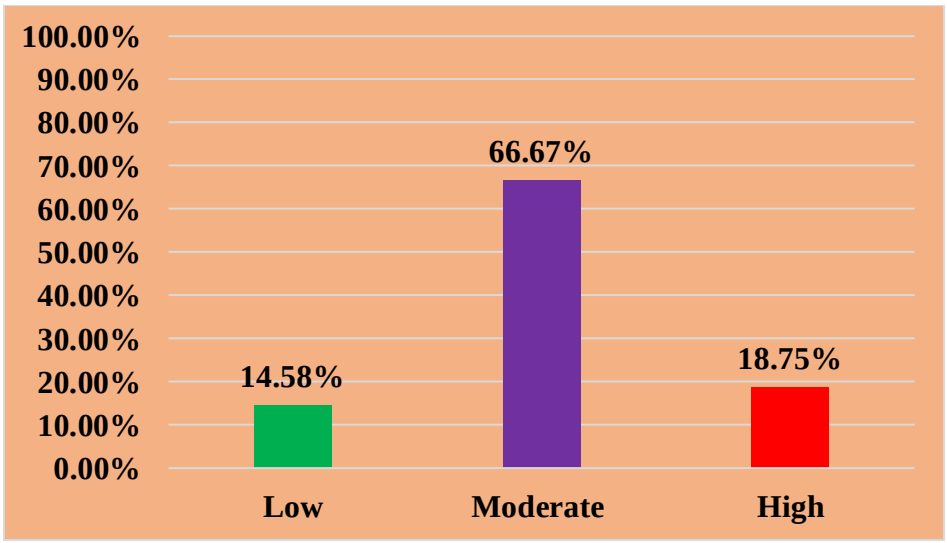

Figure no. 4.3. Nurses perception about medication errors

DISCUSSION:

Current study undertaken at Children's Hospital, Lahore regarding perception and contributing factors to medication administration and distribution errors among nurses in which 48 nurses appeared having age range 25 years to 36 years old. Majority of study participants were single having 3 to 5 years experience. Only 43.75% participants got training of medication administration errors. In the sample of 48 participants only 12.50% reported medication errors in the hospital.

Current study seems to be dissimilar with the finding of **(M.O. Ayorinde and P.I. Alabi, 2019)** who found that nurses have good knowledge and perception of medication errors whereas this study determined moderate level of perception although other findings is in accordance with this result as main reasons for medication were confusion of drugs with different names and increase patient to nurse staffing ratio.

Another study by **(Aimable Nkurunziza et al., 2019)** verified this result as workload might be the main factor contributing to medication administration errors. Due to overwork, shortage of workforce and lack of time may be the reasons of malpractices among healthcare workers. As well as this result is not according to the findings of **(Tsegaye et al., 2020)** who reported the prevalence of medical administration error in this study was 57.7% and 30.4% of them made it more than three times while our study didn't determine the prevalence of medication errors in the hospital. Although other findings verified current study result as lack of training, unavailability of guideline, poor communication when face problem, interruption and failure to follow medication administration rights were seems to be prime factors for medication errors among nurses.

Current study is also in accordance with the findings of **(M.R. Moustafa, 2023)** who revealed most of the common reasons of medical errors were inadequate unit staffing level, long shift/over time and the nurse miscalculates the dose. Same result determined by current study as inadequate nursing staff also a main reason of medication errors among nurses. Same findings determined by **(Mi-A Y et al., 2015)** as the most common reasons for MAEs were inadequate number of nurses in each working shift and administering drugs with similar names.

Another study by **(Wondmieneh et al., 2020)** also verified current study result as most of the contributing factors such as the lack of adequate training, unavailability of a guideline for medication administration, inadequate work experience, interruption during medication administration and night duty shift were significant predictors of medication administration errors. Definitely, night duty and nurse to patient ratio also may cause malpractices. On the contrary, if a person is well-experienced then mistake never be happened because if you are mentally and physically tired too, you will always do the right things due to adequate clinical skills.

Here, point to be noted that practice makes a man perfect and healthcare staff required accurate practice to acquire optimum level of medical skills and for this purpose immediate heads and nursing institutes must contribute to become nursing students well-equipped so that malpractices may be minimized. As well as, human psychology also does matter, as if a human doesn't have learning aptitude then he/she will never learn anything because passion of a person having great impact in the learning process of humans. Another factor of learning is motivation, if you are not motivating good performers then they will never be interested to learn anything in the life so always encourage and motivate nursing students so that they can get expertise in the clinical skills.

CONCLUSION:

Consequently, moderate level of perception regarding medication administration and medication distribution errors found among most of the respondents. Use of abbreviation, confusion about different drugs with similar names, increase patient to nurse ratio, poor communication between nurse and physician, long working hours, night shift, inadequate unit staff and lack of training regarding prevention of medication errors were the main factors contributing medication administration and distribution errors.

RECOMMENDATIONS

- Organize seminars/training to prevent medication errors among nurses and improve their time management skills.
- Improve clinical skills of nurses by clinical rotation.
- Educate nurses to report medication errors so that they can be minimized.
- Overcome shortage of staff in every shift.
- Provide flexible working hours to nurses to become them mentally and physically healthy because healthy brain and healthy body brings fruitful outcomes for the humanity.
- Motivate nurses so that they may improve their clinical skills by awarding incentives and rewards.

REFERENCES:

1. Poornima, P., Reshma, P., Ramakrishnan, Rani, N. V., & Devi (2015). Medication reconciliation and medication error

prevention in an emergency department of a tertiarycare hospital. *Journal of Young Pharmacists, 7*, 241.
2. Aboshaiqah, A. E. (2014). Nurses' perception of medication administration errors .*American Journal of Nursing Research, 2*(4), 63–67.
3. Aronson (2009). Medication errors: Definitions and classification. *British Journal ofClinical Pharmacology, 67*, 599–604.
4. Leufer, T., & Cleary-Holdforth, J. (2013). Let's do no harm: Medication errors in nursing: Part 1. *Nurse Education in Practice, 13*(3), 213–216.
5. Stratton, K. M., Blegen, M. A., Pepper, G., & Vaughn, T. (2004). Reporting of medicationerrors by pediatric nurses. *Journal of Pediatric Nursing, 19*(6), 385–392.
6. Flynn, L., Laing, Y., Dickson, G. L., Xie, M., & Such, D. C. (2012). Nurses' practice environments,error interception practices, and inpatient medication errors. *Journal ofNursing Scholarship, 44*(2), 180–186.
7. Keers, R. N., Williams, S. D., Cooke, J., & Ashcroft, D. M. (2013). Causes of medicationadministration errors in Hospitals: A systematic review of quantitative and qualitative evidence. *Drug Safety, 6*, 1045–1067.
8. Rodriguez-Gonzalez et al., (2012). Prevalence of medication administration errors in two medical units with automated prescription and dispensing. *Journal of the American Medical Informatics Association :JAMIA, 19*(1), 72–78.
9. Yung, H. P., Yu, S., Chu, C., Hour, I. C., & Tang, F. I. (2016). Nurses' attitudes and perceived barriers to the reporting of medication administration errors. *Journal ofNursing Management, 24*(5), 580–588.
10. Blignaut, A. J., Coetzee, S. K., Klopper, H. C., & Ellis, S. M. (2017). Medication administration errors and related deviations from safe practice: An observational study.*Journal of Clinical Nursing*, 1–14.
11. Gorgich, E. A. C., Barfroshan, S., Ghoreishi, G., & Yaghoobi, M. (2016). Investigating thecauses of medication errors and strategies to prevention of them from nurses andnursing student viewpoint. *Global Journal of Health Science, 8*(8), 220–227.
12. Benjamin, D. M. (2003). Reducing medication errors and increasing patient safety: Casestudies in clinical pharmacology. *Journal of Clinical Pharmacology, 43*, 768.
13. Mayo, A. M., & Duncan, D. (2004). Nurse perceptions of medication errors: What we needto know for patient safety. *Journal of Nursing Care Quality, 19*(3), 209–217.
14. Feleke, S. A., Mulatu, M. A., & Yesmaw, Y. S. (2015). Medication administration error: Magnitude and associated factors among nurses in Ethiopia. *BMC Nursing, 14*(1), 53.
15. Gorgich, E. A. C., Barfroshan, S., Ghoreishi, G., & Yaghoobi, M. (2016). Investigating thecauses of medication errors and strategies to prevention of them from nurses andnursing student viewpoint. *Global Journal of Health Science, 8*(8), 220–227.
16. Seyyedeh, E. R., Mohammad, C. A., Amir, N., Amir, S., Ayeshe, E. H., & Esmaeil, N. M.(2013). Medication errors of nurses in the emergency department. *Journal ofMedicine, 6*.
17. Treiberand, L. A., & Jones, J. H. (2010). Devastatingly human: An analysis of registered nurses' medication error accounts. *Qualitative Health Research, 20*(10), 1327–1342.
18. Flynn L, Liang Y, Dickson GL et al. (2012). Nurses' practice environments, error interception practices, and inpatient medication errors. J Nurs Scholarsh;44:180–6.
19. Carlton G, Blegen MA. (2006). Medication-related errors: a literature review of incidence and antecedents. Annu Rev Nurs Res;24:19–38.
20. Armitage G, Knapman H. (2003). Adverse events in drug administration: a literature review. J Nurs Manag 2003;11:130–40.
21. Dubois CA, D'Amour D, Tchouaket E et al., (2013). Associations of patient safety outcomes with models of nursing care organization at unit level in hospitals. Int J Qual Health Care; 25:110–7.
22. Britten N. (2009). Medication errors: The role of the patient. Br J ClinPharmacol; 67:646-50.
23. M.O. Ayorinde and P.I. Alabi (2019). Perception and contributing factors to medication administration errors among nurses in Nigeria International Journal of Africa Nursing Sciences 11 (2019) 10015.3
24. Aimable Nkurunziza et al., (2019). Errors and Barriers to Self- Reporting among Nurses: A Review of Literature Rwanda; Factors Contributing to Medication Administration Journal of Medicine and Health Sciences Vol. 2 No.3.
25. Tsegaye et al., (2020). Medication Administration Errors and Associated Factors Among Nurses.International Journal of General Medicine:13 1621–1632.
26. M.R. Moustafa (2023). Nursing perceptions of medication administration errors.
27. Mi-A Y et al., (2015). Perceptions regarding medication administration errors among hospital staff nurses of South

KoreaInternational Journal for Quality in Health Care, 27(4), 276–283. doi: 10.1093/intqhc/mzv036

28. Wondmieneh et al., (2020). Medication administration errors and contributing factors among nurses: a cross sectional study in tertiary hospitals, Addis Ababa, Ethiopia; BMC Nursing; 19:4 https://doi.org/10.1186/s12912-020-0397-0.