

# Unsafe medication administration experience in nursing practice at Public Hospitals of Harari region, eastern Ethiopia: Phenomenological Study

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## Research article

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# Abstract

**Background:** The unsafe medication administration is one of the most medication related problems which causes harm and death to the patients and threatens the healthcare system. Medication administration is predominantly the role of nurses. This study was aimed to explore the nurse's experience of unsafe medication administration at public hospitals in Harari region, eastern Ethiopia.

**Methods:** A phenomenological study design was conducted. The data were collected among 11 nurses from March 1 to 31, 2019. The tape recorder and note taking was used to collect the data by in-depth interview and key informant interview method. Open code software version 3.4 was used to write memos, coding and categorizing under their inductive thematic areas. Thematic analysis method were used.

**Result:** The study had explored nurse's experience of unsafe medication administration. Nurses have reported that they have ever experienced unsafe medication administration like, wrong time, medication, patient and self-stick injury during their practice. **i)** Organizational factors: inadequate resource, lack of clear policy and job description, lack of supervision and poor collaboration among staffs. **ii)** Precondition challenges: expensive medication, frequently changed and too much prescription for a single patient, new medications with limited information. **iii)** Individual nurses factors: work absenteeism, lack of training and knowledge gap.

**Conclusion:** The organizational culture, precondition challenges and individual nurse's factors was found to be a major factors linked to unsafe medication administration practice. So tailored intervention is needed to reduce the unsafe medication administration in nursing practice.

## Background

The medication administration for the patient is a compound procedure assumed by properly competent nurses(1). It is a part of clinical nursing practice with a high risk of unsafe practice occurrence(2), and a very critical step because once the medicine is in the patient's body, the possibilities of reversing the error are limited (3). Errors may occur during any phase of the medication process: prescription, dispensing, administration, monitoring, and documentation (4). However, one-third of medication errors causing harm to hospitalized patients happen in the preparation and administration phase, which is predominantly a nursing activity (5).

The health ministry of Ethiopia guided that it is the nurse's responsibility to safely administer medications to a patient as ordered by the physician and should follow three steps: preparation, administration, and documentation. Each step requires safety checks to ensure that the right drug is given to the right patient(6). Therefore, a safety check tasks during medication administration practice (MAP) is a critical because, nurses represent the last safety check in the chain of medication management and the final safeguard for the patient's wellbeing (7).

Unsafe medication administration practice can significantly affect patient's safety and treatment costs (1). It has been estimated that a premature death associated with preventable harm to patients were more than 400,000 (8) and claimed as the third leading cause of annual deaths in the United States (US) (9). It was estimated that on average, hospitalized patients were subjected to at least one medication error per day with a magnitude of 5 % to 20 % in United States (10).

Medication administration error in the developing countries range from 9.4% to 80 % (11). It is found to be 54% in Ethiopia (12). A study shows different factors determine nurses experience of unsafe medication administration practice includes, medication, health care professional's personal and psychological characteristics, resources and patient-related factors(13) and the organizational approaches including culture, workplace condition, learning process and risk management strategies also contribute for unsafe medication administration (14)

Health care settings uses different technologies to reduce errors (15) but, there is a much variation in the availability and accessibility of aiding tools helps to administer medication safely in resource restricted settings(16). Such variation can affect the frequency and types of errors (17). Studies were focused to identify the magnitude and predictors of medication administration errors quantitatively (12, 18). Additionally, there were no study conducted at study area on the issue in consideration. Therefore the study was aimed to explore the nurse's lived experiences of unsafe medication administration practice at public hospitals in Harari region, eastern Ethiopia.

## **Methods**

### **Design and setting**

A phenomenological qualitative study design was used. The study was conducted between March 1 and June 30, 2019 at public hospitals found in Harari regional state, eastern Ethiopia. Harari region was found at a distance of 526 km away from the capital city, Addis Ababa. Two public hospitals (Hiwot fana specialized university and Jegol referral hospital) were found in Harari region. The Hiwot fana specialized university hospital is a teaching hospital of Haramaya University with a total of 161 beds and Jegol referral hospital is a regional referral hospital of Harari regional state with 95 beds. Both hospitals provide general health service for communities in Harari region and surrounding Oromia region.

### **Study participants and sampling**

Two public hospitals found in Harari region were included and a total of 11 nurses working at inpatient unit (medical, surgical, pediatric, gynecology and intensive care units) with experience of medication administration practice were selected purposively and have participated on the study. Among them 7 nurses were participated on in-depth interview, while 4 nurses (2 unit head nurses and 2 nurse directors) were participated as key informants. The number of participants were determined based on the data saturation.

## Data collection tool and procedure

The data were collected by two nurses' with master's degree holder and had the experience of qualitative data collection. Semi-structured interview guide was prepared by reviewing the relevant literatures (18-22). An in-depth interview (IDI) guide was used to collect data from nurses working at in-patient unit. A unit head nurse and nurse directors were interviewed using a key informant interview (KII) guide for their experience of medication administration practice. The main questions addressed were 'What is the experienced trend that the nurses follow to safely administer medication?', 'What types of unsafe medication administration practices nurses were ever experienced?' and 'what factors contributed to their experiences of unsafe Medication administration practice?'

## Operational definitions

**Medication administration:** Is the process of preparation, administration and documentation along with safety checks at each step to ensure that the right drug is given to the right patient(6).

**Unsafe medication administration practice:** Refers to any of or combination of error, wrong act, and injury involved practices in which patients and nurses are victims of the practice.

**Error:** Mistake produced through procedures of medication administration unintentionally and it is preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional, patient or consumer (23).

## Data processing and analysis

The interviews were conducted in local language, Amharic and Afaan Oromo. The IDI and the KII were audiotaped. The audios were transcribed verbatim and translated to English by a person who is proficient in both languages, Amharic and English. The translated data were checked repeatedly for correctness and imported into open code version 3.4 for data analysis. The codes under each category were printed for writing and finally organized into thematic areas. The combined strategies of coding were used to explore nurses lived experience and contributors of unsafe medication administration based on Brauan and Clarke's (24) recommendation of thematic analysis.

## Data quality control

To ensure the quality of data a multistage measure was taken at pre, during and post data collection period. Prior to the data collection the training was given for data collectors. On the data collection time high quality tape recorder was used, note was taken concurrently, continuous follow up was held by principal investigator and a setting where the privacy was kept and free from noise disturbance were used for interview. After the data were collected verbatim transcription was done, translated to English language and re-checked for accuracy by a proficient individual.

## Results

## Characteristics of study participants

Participants in this study were eleven nurses (5 female and 6 male) with a mean age of 31.2 years, bachelors and master's degree holder, 1-11 years of experience and have an experience of administering medication in different wards (medical, surgical, gynecology, medical intensive care unit and surgical intensive care unit) of Hiwot fana specialized and Jegol general hospitals.

## Experience of medication administration practice

Through analysis, three themes were explored, including organizational factors, precondition challenges and individual nurse's factors.

All of participants reported that medication administration as a part of their daily activities. Accordingly, they stated that the trend of medication administration procedures begin from physicians' order. The order must be transcribed on nurses' chart, in order to avoid spelling and timing error.

*According to our hospital's trend, first the medication ordered by physician...then an order will be transcribed into nurses' chart. (A head nurse at medical ward with 4 years of experience)*

*The first activity we perform is transcription of physician's order to a nurse's chart. (A nurse from medical intensive e care unit with 6 years' experience)*

An intravenous medications were exclusively administered by nurses, but others like, oral medications could be given by attendants or taken by patients themselves.

*We administer intravenous medication by own selves but attendants can give oral medications by themselves...sometimes the patients could receive by their own.(A nurse from medical ward with 11 years' experience)*

Nurses administer medication by following five to ten rights including, right medication, right patient, right dose, right route, right time and right documentation. Posted protocols were also used for medications like insulin.

*As a nurse I have been administering medications by following the six rights, or it may extended to ten. For example, right time, right route, right dose, right medication, right documentation. (A nurse from surgical ward with 1 year experience)*

*Some drugs need posted protocol, for example there is a posted insulin administration protocol in our unit. (A nurse from medical ward with 11 years' experience)*

A nurse initiate a preparation for the medication administration 15 minutes to 1 hour earlier to exact administration time to prevent timing error. However, they stated that no one could be free of error and could commit any unsafe medication administration practice.

*Since the patients in ward are too many, we start to prepare medications before 15 minutes to 1 hour and also sometimes we start before 30 minutes of exact administration time. (A nurse from surgical ward with 1 year experience)*

Many of participants reported that they have ever experienced unsafe medication administration. The commonly reported unsafe practices were, wrong medication, wrong preparation, wrong route, wrong time, self-stick injury, prescription error and wrong patient.

*It is common to come across with the unsafe medication administration at any steps. I don't think that it could be true if anyone says I had never made an error or unsafe acts in medication administration. (A nurse from pediatric intensive care unit with 4 years' experience)*

*I have experienced errors two to three times, like wrong medication administration. (a head nurse at medical ward with 4 years' experience)*

## **Contributing factors for unsafe medication administration practice**

### **i) Culture within the organization**

#### **Resource and environment**

Lack of adequate resources was mentioned as a main challenge associated with unsafe medication administration practice. Accordingly, inadequate drug supply, lack of cabinets for storage, lack of staffs and lack of machines aid for medication administration were major problems influencing their practice.

*There are material shortages in our hospital, including cabinets, machines like infusers to control dosage and staffs. (A head nurse at pediatric ward with 8 years' experience)*

*There is a shortage of medication in our hospital. (A nurse from surgical ward with 4 years' experience)*

Consequently, nurses reported that patients buy medications at expensive price from private pharmacies. This contributes for missed and wrong time medication administration since, they may not afford or delay to buy it. Additionally some of medications bought from private pharmacies were expired.

*Patients may delay to buy a medications on time and sometimes they could not afford them. (A head nurse at medical ward with 4 years' experience)*

*Patients had purchased a medication...but it was expired when we checked it. (A nurse from surgical ward with 1 year experience)*

Nurses described that uncomfortable working environment was affected their medication administration practice.

*They (nurses) stay away from patient's bed side due uncomfortable ward and attendants' over crowdedness. (A head nurse at pediatric ward with 8 years' experience)*

## Policy and process

Nurses stated that the unclear medication administration policy, lack of updated guideline and unclear standards were greatly affect their medication administration practice.

*There is no policy, standardized guideline and protocol regarding medication administration that guides nurses or others, who administer medication in our hospital. (A nurse director with 33 years' experience)*

Nurses also reported that the system of organization such as, lack of multidisciplinary involvement, job description and formal error reporting system.

*There is lack of multi-disciplinary involvement during round, which should involve all responsible health care professional like physician, nurses and pharmacists. (A head nurse at pediatric ward with 8 years' experience)*

*There is no job description and formal error reporting system in our hospital. (A nurse from pediatric intensive care unit with 4 years' experience)*

## Supervision

Nurses reported that there was lack of regular supervision in the hospital but, occasional supervision from a regional health bureau.

*There is no regular supervision and follow up on medication administration practice in our hospital, but there is a rare supervision from regional health bureau. (A nurse director with 33 years' experience)*

## Collaboration

Nurses reported that there were a communication gap among health care professionals and it have influenced their experience of medication administration practice. Physicians did not communicate orally or through documentation with each other on the patient status.

*There is a communication gap among physicians. They didn't share information about the status of patient with each other orally or by writing. (A head nurse at medical ward with 4 years' experience)*

Nurses also reported that there was a lack of direct communication among nurses and physicians since the round involves only physicians and medical intern students. There by the newly ordered, revised and added medications were orally informed to medical intern students.

*The physicians didn't inform nurses directly concerning the patient's status and new medication order, but for students during round. (A nurse from surgical ward with 5 years of experience),*

Poor communication among nurses including, sharing of defected experiences and failure to report an error, oral handover without formal written and sign, not involving the patient on their own care.

*There are a problem like, a poor hand over system among nurses and there is also a lack of patients' involvement on their own care. (A head nurse at pediatric ward with 8 years' experience)*

Language barrier was reported as a challenge to communicate and explain a procedure to the patient, since most of the patients speak Afan Oromo whereas, nurses spoke Amharic. Such problem were raised due to the employment of nurses from different parts of the country other than the local area.

*There is a language barrier since most of patients are Afaan Oromo speakers but nurses couldn't understand it. That is due to employment of health care providers from different regions of the country. Most of them (nurses) are Amharic speakers. So they couldn't explain the procedure to patient. (A nurse from gynecology ward with 3 years' experience)*

## **ii) Precondition factors**

### **Patients and medication order**

Nurses described that the frequent omission and refusal by patients to receive a newly ordered medication. It was due to the frequent order by different physicians for the same patient and they challenged to convince the patients to receive their medication.

*Patients may not buy a medication on time and refuse to take the medications, due to the repetitive order of medications by different physicians for the same patient. (A head nurse from medical ward with 4 years' experience)*

### **Medications and chain of process**

Similarity of medications by their color, label and package were factors linked to medication and contribute for unsafe medication administration in nursing practice. The other factors reported by nurses were limitation of information for new and rare medications.

*Most medications are similar in their ampoule color, size, label and even their packages. This may lead to error, especially those newly produced and uncommon medications have only few information on their description label. (A nurse from surgical intensive care unit with 10 years' experience)*

Nurse reported that a similar medications have crossed many chains from a regional to hospital drug store, dispenser and nurses. The error starts from the first person in the chain of processing.

*Errors may be happened in a sequent form, starting from the first person to the last point of use. Pharmacists may made an error due to the similarities of medication, which may repeated by nurses. (A nurse from medical intensive e care unit with 6 years' experience)*

## **iii) Individual nurse's factor**

### **Personal motivation**

A deliberate violation of medication administration including documentation error by ticking rather than putting their name and signature on charts, carelessly delaying the administration time unless somebody else told them to do so or administering before the due time especially, at night time to sleep early, deliberate absence from round and working shift.

*Nurses sometimes delay or may not administer medications unless somebody else told them to do it. Most of nurses administer medication before the due time, because they want to sleep early during the night shift. (A nurse from pediatric intensive care unit with 4 years' experience)*

*Failing to record and sign the administered medication, also there is timing error sometimes. (A nurse director with 6 years' experience)*

*There is an absenteeism by nurses from the regular job as well as from the bedside round. (A nurse from medical intensive care unit with 6 years' experience)*

## **Cognitive dimension**

Being the novice nurse was the reason mentioned by nurses, which contribute for unsafe medication administration.

*I was a new staff at the time and I was confused to administer new medications, because I don't know how to administer it. (A nurse from surgical intensive care unit with 10 years' experience)*

Lack of training on medication administration were also perceived as the factor led to unsafe medication administration (Table 1).

*There is no training on medication administration in our hospital. (A head nurse at medical ward with 4 years of experience)*

## **Discussion**

This study have explored nurses experience and factors contributing to unsafe medication administration practices under three thematic areas (i) Organizational culture: Resource and environment, policy and process, supervision, collaboration. (ii) Precondition challenges: patients and medication order, medication and chain of its process. (iii) Individual nurse factors: personal motivation and dimension of cognition.

In this study nurses described that the organizational system influence their medication administration practice. They have mentioned workplace conditions, like shortages of staffs, lack of cabinets for medication storage and lack of technology-aided medication administration equipment like infuser. This is supported by the study finding in two central hospitals of Finland (13). The similarity may be due to the fact that poor resource and working environment greatly affects medication administration practice.

Nurses in this study also reported that a lack of sufficient training and clear job description greatly affect their medication administration practice. This was consistent with a study finding conducted in Malaysia (26). The consistency may be due to the fact that lack of training and job description among different settings may lead to unclear role and responsibility among health care providers(16).

Nurses in this study reported that operational processes related to medication administration such as multidisciplinary involvement, and lack of formal error reporting systems were negatively influencing their practice. This was supported by Ethiopian medication processing strategies which obliges hospitals to have central cabinet for medication storage and error reporting system (6). The deviation from such strategies may be due to an organization's lack of supervision.

The other nurses' confusion related to safe medication administration are lack of inadequate components and clear medication administration rights. This is supported by another study finding (28) compared to the 10 rights (29, 30) nurses were varied in their knowledge of medication administration rights as 5 rights' to 10 rights'. This may be due to educational setting difference and lack of standardization (16). As a result, nurses stated that there is no cut point of normal range from the exact ordered time for medication administration(31). Nurses reported that they were used their own experience to administer medications within 15min to 1hour time before and after the ordered time, based on nurse-patient ratio this shows similarity with previous studies (31, 32).

The chain of error in the medication administration process was one of main challenges described by nurses. It was reported that a similar medication was crossed many chains of errors from regional drug store-hospital drug store to dispenser to medication administering nurses. This finding was supported by the study conducted in Malaysia(26).

Lack of good collaborations and poor communication among health care providers and clients were those mentioned as factors contribute for unsafe medication administration practice. This finding was supported by the study conducted in Finland, which emphasize the maintenance of patient safety through applicable procedures and effective collaboration (13).

Absence of regular supervision was one of the major contributing factors to unsafe medication administration practice. This was supported by study finding conducted in Iran, shows similar concerns related to lack of supervision (33).The consistency may be due to the fact that supervision is very important in clinical areas.

Nurses in this study described that the language barrier was one of the challenge to influence their medication administration practice. Accordingly, a lack of understanding each other among patients and health care professionals. Such barrier negatively influence nurses medication administration practice (27).

Precondition challenges such as: patient conditions, physician's medication orders and medication related factors were negatively influenced their medication administration practice. This has a similar

concern with nurses report in previous studies conducted in Iran(13, 14).

In this study described that different behavior among nurses contributed to the unsafe medication administration. This finding is supported by study conducted in England (17). Accordingly, being a novice nurse (34), lack of training (26), poor communication among nurses(14, 20), memory lapses due to work overload (20, 35) and nurses personal motivation(34) were personal factors affect medication administration practice.

## **Conclusion**

This phenomenological qualitative study has explored nurse's experience and contributing factors. The organizational culture/system, precondition challenges and individual nurses' factors were explored as the major factors affect nurse's medication administration practice. Accordingly, poor organizational systems such as: inadequate drug supply; lack of technology use, lack of training, lack of multi-disciplinary collaboration, lack of central cabinet for medication storage, lack of training for new staff, lack of regular supervision, lack of motivating environment for workers; lack of error reporting system, lack of active collaboration among health care professions and clients. Therefore modifying those factors can improve nurse's medication administration practice through tailored made intervention.

## **Declarations**

### **Ethical approval and consent to participate**

An ethical clearance was obtained from the Institutional Health Research Ethics Review Committee [IHRERC] of the College of Health and Medical Sciences, Haramaya University. Support letter was written to all public hospitals where the study was conducted. Individual informed voluntary written consent was obtained from each study participant. The respondents were assured of confidentiality by excluding their names during the data collection. They were informed well that they had full right to refuse to participate and / or withdraw from the study at any time without any pre-condition.

### **Consent to publish**

'Not applicable'

### **Availability of data and materials**

The datasets used for analysis are available from the corresponding author upon reasonable request.

### **Competing interests**

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

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### **Authors' contributions**

AO, conceived the study, developed the tools, collected, analyzed and write up the result. BG and GE also participated in advice and consultation of the proposal development, data collection, analyze and write of result. GF participated on data collection, analysis and write of manuscript. All authors read and approved the final manuscript.

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## **Abbreviations**

IDI: In-depth Interview

KII: Key Informant Interview

MAP: Medication Administration Practice

US: United States

## **References**

1. Ragaa.A AE. Nursing Innovations: Medication Administration Errors and Safety. Journal of Nursing and Health Science (IOSR-JNHS). 2017; 6(3 ):PP 75-85.
2. Efstratios.A. Prevention of medication errors made by nurses in clinical practice. J Nurs Care 2012;6(4):772–83.
3. Kimeu.V. factors influencing medication administration practice among nurses at kenyatta national hospital general critical care unit. a dissertation submitted in partial fulfilment of the requirements for award of degree of master. 2015;1(1):1-84.
4. Ruby ZC. Simple steps to reduce medication errors. AMJ. 2016;46(8 ).
5. Smeulers.M, Verweij.L, Maaskant.M, de Boer .M, Krediet.T, Nieveen van Dijkum.J, et al. Quality indicators for safe medication preparation and administration: a systematic review. PLoS One. 2015;10(4):e0122695.
6. MoH. Nursing Care Practice Standards.A Reference Manual for Nurses and Healthcare Managers in Ethiopia, Addis Ababa, Ethiopia. ministry of health. 2011; 2:1-170.

7. Ojerinde A AP. Factors Associated With Medication Errors Among Health Workers In University College Hospital, Nigeria. *Journal of Nursing and Health Science (IOSR-JNHS)*. 2014;Volume 3(Issue 3 ):PP 22-33.
8. John.T. A new evidence based estimate of patients harm associated with hospital care. *Journal of patient safety*. 2013.
9. Makary M DM. Medical error—the third leading cause of death in the US. *Bmj*. 2016;353:i2139.
10. AlsulamiZ, S C, I C. Medication errors in the Middle East countries: a systematic review of the literature. *European journal of clinical pharmacology*. 2013;69(4):995-1008.
11. AlsulamiZ, S C, I C. Double checking the administration of medicines: what is the evidence? A systematic review. *Archives of Disease in Childhood*. 2012;97(9):833-7.
12. Senafikish A, Ababe M, Y S. Medication administration error: magnitude and associated factors among nurses in Ethiopia. *BMC Nurs*. 2015;14(53):1-8.
13. Härkänen.M, Blignaut.A, Julkunen.V. Focus group discussions of registered nurses' perceptions of challenges in the medication administration process. *Nurs Health Sci*. 2018;20(4):431-7.
14. Pazokian.M, Zagheri.T, Rassouli.M. Iranian nurses' perspectives on factors influencing medication errors. *Int Nurs Rev* 2014;61(2):246-54.
15. Seidling H, Lampert A, Lohmann K, J S, Send A, Witticke D, et al. Safeguarding the process of drug administration with an emphasis on electronic support tools. *British journal of clinical pharmacology*. 2013;76(S1):25-36.
16. Gonzales.K. Assessments of safe medication administration in nursing education. *Journal of Nursing Education and Practice*. 2012;2(1):1-12.
17. McLeodM, NicholasB, BryonyDF. Facilitators and Barriers to Safe Medication Administration to Hospital Inpatients: A Mixed Methods Study of Nurses' Medication Administration Processes and Systems (the MAPS Study). *PLoS One*. 2015;10(6):e0128958.
18. Asrat A, B W, W M. Medication administration errors in an intensive care unit in Ethiopia. *International Archives of Medicine*. 2012;5(15):1-7.
19. Björkstén.K, Monica.B, Andersén.K, Lina.B, Johanna.U. Medication errors as malpractice—a qualitative content analysis of 585 medication errors by nurses in Sweden. *BMC Health Services Research*. 2016;16(431):1-8.
20. Brady A MA, Fleming S. A literature review of the individual and systems factors that contribute to medication errors in nursing practice. *J Nurs Manag*. 2009;17(6):679-97.
21. Nkurunziza A, Chironda G, Mukeshimana M. Perceived contributory factors to medication administration errors (MAEs) and barriers to self-reporting among nurses working in paediatric units of selected referral hospitals in Rwanda. *International Journal of Research in Medical Sciences*. 2018;6(2):401-7.
22. Reason.J. Human error: models and management; Department of Psychology, University of Manchester, Manchester M13 9PL. *BMJ*. 2000;320:768–70.

23. Gabriella.R, Eloni.T, José.R. Medication errors: classification of seriousness, type, and of medications involved in the reports from a University Teaching Hospital. *Brazilian Journal of Pharmaceutical Sciences*. 2013;vol. 49(4):793-802.
24. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative research in psychology*. 2006;3(2):77-101.
25. Saldana J. *The coding manual for qualitative researchers. first cycle coding method*. 2013;Second edition PP 58 -PP 93.
26. Nizaruddin.M, Omar.M, Mohamed A, Bakry.M. A qualitative study exploring issues related to medication management in residential aged care. *BMC Open Access*. 2017;11:1869–77.
27. Berland A, Bentsen SB. Medication errors in home care: a qualitative focus group study. *J Clin Nurs*. 2017;26(21-22):3734-41.
28. Elliot M, LiuY. The nine rights of medication administration: an overview. *British Journal of Nursing*. 2010;19(5):300-5.
29. Garrett RK, Craig JB. *Medication administration and the complexity of nursing workflow*. 2009.
30. Nwagwu.V. Ten rights of medication administration and management developmental disabilities administration. 2016:1-53.
31. Medved.F. medication, environmental, and patient factors that influence medication administration delivery times. *Electronic Theses and Dissertations*. 2016;5747:1-91.
32. Teunissen R, Bos J, Pot H, Pluim M, C K. Clinical relevance of and risk factors associated with medication administration time errors. *American Journal of Health-System Pharmacy*. 2013;70(12):1052-6.
33. Sharif.F, Masoumi.S. A qualitative study of nursing student experiences of clinical practice. *BMC Nursing*. 2005;4(6):10.1186/472-6955-4-6.
34. Lall.S. The Lived Experience of Making a Medication Administration Error in Nursing Practice. *International Journal of Nursing*. 2017;4(2).
35. Keers N, Williams S, Cooke J, D A. Causes of medication administration errors in hospitals: a systematic review of quantitative and qualitative evidence. *Drug Saf*. 2013;36(11):1045-67.

## Table

**Table 1.** Sample of inductive analysis used to explore nurses experience of unsafe medication administration practice at the public hospitals of Harari region, eastern Ethiopia, 2019.

No	THEME	CATEGORIES	MEMOS (SUB-CATEGORIES )	CODES
1	culture within organization	Resource and environment	Resource	r Inadequate drug supply
				r Inadequate staffing
			Environment	E overflow
				E teaching hospital
		Policy and process	Policy	PI Inadequate policy
				PI unclear MA guide
			Process	Pr shifting schedule
		Pr lack of multi-disciplinary		
		Supervision	Supervision	s inadequate supervision
				s fail to correct problems
			Follow up	f lack of follow up
		f Lack of monitoring		
		Collaboration	Communication	c nurse to nurse handover
c nurse to physician gap				
Language barrier	b Language barrier			
	b lack of patient involvement			
2	Precondition challenges	precondition related to patients and orders	Patients condition	P patient status
				P living place
			Physician order	o without investigation
		o frequent changed		
		Medications and its chain of process	Medication	md lookalike
				md high risk

				medications
			Chain of error	ch chain of error
				ch first errors continued
3	Individual nurse factors	personal motivation	Violation	v absence at working unit
				v being careless
			Motivation	m unsatisfied to work
				m lack of motivation
		Cognitive dimension	Knowledge	k inadequate knowledge
				k I didn't understand
			Experience	e lack of experiences