"Strategic reduction of medication errors in Emergency Department At Mabarah Hospital in Port Said city"

Authors

Hala Abdo Ibrahim soliman[1]; Hader Mahmoud Mohamed elsayed Ahmed Elzaghawy[2]; Basma Gamal Mohamed mokhtar Mohamed Ibrahim hetemi[3]; Gehad Reda Mohamed Abdel Fattah[4]; Asmaa Mohamed Ewies Ahmed[5]; Norhan Yasser Al-TamimiFahmy Gharbih[6]; Norhan Tarek Mohamed Jamal Eltawel[7]

[1]**Faculty of nursing in port said**

[2]**Faculty of Nursing at Port Said University Complete the study of master degree in nursing administration in faculty of Nursing at Port Said University Attain ministry training for infection control Attain ICDL course Attain the toeful course**

[3]**Faculty of pharmacy -Egyptian Russian University**

[4]**A graduate of a health institute And complete the Faculty of Nursing Ain Shams University**

[5]**Faculty of Nursing at Port Said University**

[6]**Faculty of Nursing Ain Shams University**

[7]**Bachelor of Technology**

Abstract:

Background: Medication errors occur at any point of the medication management process involving prescribing, transcribing, dispensing, administering and monitoring, have been reported to account for approximately one-quarter of all healthcare errors.. *So,* **the aim** of this study is to identify the strategic reduction of medication errors in emergency department at El-mabarha hospital Port Said city.

 Subjects and Methods: A descriptive research **design** was utilized. The **subjects** number 110 health care staff doctors, nurses & technical. Data was collected by using checklist **tool**.

Results: Medications are safely and accurately dispensed according to laws and regulations" was the highest dimension that done (44.5 %) while the lowest dimension was "Medications are prepared safely" (17.3 %). Finally according to the total percentages 62.7 inspect Medication error with moderate degree.

Conclusion: it was concluded that there is a statistical difference between all healthcare providers in most of dimensions as Effective planning and management of medication, Antimicrobial Stewardship Program, Efficient medication selection and procurement, Emergency Medications, Safe medication preparation and dispensing, Safe medication administration, Effective medication monitoring, Medication errors- near misses and medication therapy problems & total; (p=0.002, p=0.029, p=0.001, p=0.004, p=0.021, p=0.001, p=0.001, p=0.001 & p=0.001 respectively).

The following **recommendations** These errors should be reported and corrected in a systematic, non-punitive manner, Patients can directly report any suspected side effects, including those caused by medication errors, Non-judgmental communication with patients about their concerns and elicit symptoms they perceive as adverse drug reactions and should be better monitoring systems to detect medication errors, based on classification and analysis of automated reports of past interactions them.

 Keywords: medication errors – the strategic reduction.

Introduction

Medication errors are among the most common errors that affect patient safety. (Samp, JC, Tochet, DR, Marinac, JS, & Co, JM 2014).

Medication error is a global problem within health care centers and hospitals and is one of the most common causes of increased mortality and morbidity in health care centers (Flynn & et al, 2012).

  These are a variety of forms of pharmacological errors including slips and drops (mistakes

in performing the task), omissions (errors in planning) and procedural violations (breaking the rules). Fault-causing conditions which can have the opposite effects of fault-causing conditions within the local workplace (e.g. time pressure, staff shortages, inadequate equipment, fatigue and inexperience). Latent failures that arise from decisions made by policy makers, leaders, and senior management. (Thomas, B & et al, 2019).

Significance of the study:

The World Health Organization has released "Medication without Harm, the WHO Global Patient Safety Challenge". She called for taking measures to reduce the harm caused to the patient as a result of unsafe drug practices and medication errors. One of the main objectives is "to assess the scope and nature of avoidable damage and to strengthen monitoring systems to detect and track such damage". (Samp, JC, Tochet, DR, Marinac, JS, & Co, JM, 2014).

The findings of this study might assist the hospital directors and nurse's managers to detect the many causes of medication errors and to make plan to reduction this errors in Egyptian healthcare system. So, the present study aims to to identify the strategic reduction of medication errors in emergency department at El-mabarha hospital port said city .

Aim of the study:- This study aims To determine the strategic reduction of medication errors in emergency department at El-mabarha hospital port said city .

The specific goals are:

1. Identify the strategic reduction of medication errors in emergency department at El-mabarha hospital port said city.

2. Inspect the process of medication administration in emergency department at El-mabarha hospital port said city .

3. Assess the steps and dimensions of medication management as perceived by staff nurses, physicians, pharmacist and technicians El-mabrha hospital.

Research questions:

1. What is the strategic reduction of medication errors in emergency department at El-mabara hospital Port Said city?

2. What is the process of medication administration in emergency department at El-mabara hospital Port Said city?

3. What is the steps and dimensions of medication management as perceived by medical staff in emergency department at El-mabrha hospital?

<u>**Subjects and method**</u>

I. Technical design:

Research Design:-The design that utilized in this study was a descriptive research design.

Study Setting: The current study was conducted at Al-Mabarrah Hospital in Port Said Medical City.

 Subjects: The subjects of this study included all staff of health care in emergency unite.

Sample size: The staff nurses group: the study sample included 200 of staff nurses (males and females) that's divided into (121 nurses from AS-Salam hospital and 79 nurses from El-zohour hospital) according to proportion of nurses number in each hospital and calculation of sample size equation:

The patients group: Convenient sample of patients who are perceive direct nursing care services in all inpatient units at the study setting for period of two months (100 patients from AS- Salam hospital and 100 patients from El- zohour hospital)

Tools for Data Collection:

This scale was developed by (ALGHAR, 2021) standards , aimed to identify the strategic reduction of medication errors its consisted to 11 standards that was included the following: The first standards was effective planning and management of medication, It was consisted of seven items , The second standard was Antimicrobial Stewardship Program it was consisted of 5 items, The third standard was Efficient medication selection and procurement it was consisted of 1item, the fourth standard was Safe medication storage it was consisted of 6 items, the fifth standard was a Emergency Medications it was consisted of 4 items and the sixth standard was Safe medication preparation and dispensing it was consisted of 5 items, the seventh standards was Safe medication preparation and dispensing it was consisted 5 items, The eighth standard was Medications are prepared safely.it was consisted of 5item, the ninth standard was Medications are safely and accurately dispensed according to laws and regulations it was consisted of 5 items, the tenth standard was Safe medication administration it was consisted of 6 items and the eleven twelve standard was Medication errors, near misses, and medication therapy problems it was consisted of 3 items.

Scoring system: All standards items were scored on 0 "not done" & 1 "done", (ALGHAR, 2021)

II. Operational design: Operational design includes the preparatory phase validity, reliability and field work.

Preparatory phase: It included reviewing of literature, different studies and theoretical knowledge of various aspect of hospital infrastructure, quality of nursing care and patient satisfaction using books, research articles, internet, periodical, magazines and internet.

Content validations of the tools: Revision of all tools ascertained by seven nursing experts to ensure content validity.

Reliability: Cronbach's alpha coefficient was calculated to evaluate the reliability of all instruments.

Field work: Data have been collected during 6 months throughout the period from beginning of March 2020 to the end of August 2020. The field work has been performed in the following sequence:

The tool sheet filled in by the researcher at El mabara hospital by observation checklist on emergency department.

Third. Administrative design: - Prior to conducting the study, the director of each location was contacted and informed in order to obtain permission for all staff in the emergency department on the current research after explaining the purpose of the study, and written permission was obtained. Regarding data collection, oral agreement was taken from each subject, after a clear and simple explanation of the purpose of the study. The researcher also reassured the respondents not to disclose their answers to the items of observation to the staff, and that the information used for scientific research is only and to be treated as confidential.

Ethical Considerations: This study was approved by the Ethical Scientific Research Committee, Faculty of Medicine, Port Said University. Informed consent was obtained from hospital administrators after explaining the purpose and nature of the study.

Results

Table (1): Personal Characteristics of the studied group (n=110).

Variable	Sample (n=110)	
	No	**%**
Age in Years		
<30	31	28.2
30 :< 40	49	44.5
40 : <50	26	23.6
50 : 60	4	3.6
Mean±SD	36.43±8.19	
Marital status		
Single	38	34.5
Married	54	49.1
Divorced	13	11.8
Widowed	5	4.5
Gender		
Male	46	41.8
Female	64	58.2
Educational level		
Nursing school	3	2.7
Technical institute	23	20.9
Bachelor degree	70	63.7
Master degree	13	11.8
Doctoral degree	1	0.9

Your Job in the hospital		
Physician	46	41.8
Nurse	34	30.9
Pharmacist	10	9.1
Technician (lab-ray)	20	18.2
Years of experience		
1-5 years	26	23.6
6-10 years	41	37.3
11-15 years	34	30.9
More than 15 years	9	8.2
Hospital provide medication administration training		
Yes	51	46.4
No	59	53.6
Did you attend a workshop about drug management		
Yes	38	34.5
No	72	65.5
Importance of knowledge related to drug management process and medication error?		
Very important	55	50.0
Important	29	26.4
Not important	19	17.3
Not important any more	7	6.4

Table (1) Describes the personal characteristics of the studied group, less than half (44.5 %) of the studied group aged from 30 :< 40 years, approximately half of them (49.1 %) are married and more than half of them were female (58.2 %). Two thirds of them (63.7 %) have bachelor degree education, while one third of them have 6-10 years of experience (37.3 %). More than one third of studied group (41.8%) was worked as physicians. More than half of the studied group stated that hospital not provide medication administration training, and also more than two thirds of the studied group (65.5%) have not attend workshop about drug management. Finally half of the studied group recognizes the knowledge related to drug management process and medication error as very important.

Table (2): Effective planning and management of medication inspection

Items	Not-done		Done	
	no	**%**	**no**	**%**
The regulation, administration and use of medicines is in line with the scope of hospital services to meet the needs of patients in accordance with applicable laws and regulations.	56	50.9	54	49.1
The hospital develops drug management and safety programs in accordance with applicable laws and regulations. The program handles all the elements from a) Planning	40	36.4	70	63.6
b) Selection and procurement	52	47.3	58	52.7
c) Storage	46	41.8	64	58.2
d) Ordering and prescribing	68	61.8	42	38.2
e) Preparing and dispensing	51	46.4	59	53.6
f) Administration	63	57.3	47	42.7

g) Monitoring	50	45.5	60	54.5
h) Evaluation	61	55.5	49	44.5
The hospital has a clear structure for pharmaceutical services, and a competent and licensed pharmacist supervises all pharmaceutical activities	56	50.9	54	49.1
The hospital has a Drugs Committee (DTC) with clear references.	44	40.0	66	60.0
Sources of information regarding updated and appropriate medicines are available either in electronic form or in paper form to those involved in drug administration	45	40.9	65	59.1
The hospital selects and monitors process and result indicators for drug safety and drug management.	39	35.5	71	64.5
There is an annual review of the Drug Administration and Safety Program document.	40	36.4	70	63.6

Table (2) shows the perception of the studied group regarding effective drug screening planning and management, according to the table "The hospital selects and monitors process and result indicators for drug safety and drug management" was the highest item performed (64.5%). While the highest item not accomplished was "The hospital is developing drug management and safety programs in accordance with applicable laws and regulations. The program processes all elements of the order and prescriptions" (61.8%).

Table (3): Antimicrobial Stewardship Program of medication inspection

Items	Not-done		Done	
	No	%	no	%
The hospital has a multidisciplinary antimicrobial stewardship program based on the core elements of the Center for Disease Prevention and Control (CDC), law, regulations, and guidelines.	44	40.0	66	60.0
The hospital educates staff, patients, and their families about antimicrobial stewardship and appropriate use of antimicrobials.	35	31.8	75	68.2
The hospital uses an antimicrobial stewardship program and approved multidisciplinary protocols.	46	41.8	64	58.2
The hospital tracks, aggregates, analyzes and reports data to the Antimicrobial Stewardship Program.	43	39.1	67	60.9
The hospital is working on improvement opportunities identified in the Antimicrobial Stewardship Program.	36	32.7	74	67.3

Table (3) Shows the perception of the studied group regarding the antimicrobial stewardship program for drug screening, according to the table "The hospital educates staff, patients and their families on antimicrobial stewardship practices and appropriate use of antimicrobials" was the highest item performed (68.2%).

While the highest item not implemented was "the antimicrobial stewardship program uses

hospital approved multidisciplinary protocols" (41.8%).

Table (4): Efficient medication selection and procurement of medication inspection

Items	Not-done		Done	
	No	%	no	%
The institution establishes and perform a policy and procedures that determine the selection and procurement of medicines. The policy addresses at least the following: a) Determining the location and the transition process.	49	44.5	61	55.5
b) Suppliers are monitored and evaluated to ensure that the purchased drugs are from reliable sources	46	41.8	64	58.2
c) The list of medicines (prescription booklet) is monitored, maintained and updated	35	31.8	75	68.2
d) Monitors drug transportation to ensure that transportation complies with applicable laws and regulations, approved establishment policy, and manufacturer recommendations.	51	46.4	59	53.6
e) The hospital has an approved list of approved drugs	47	42.7	63	57.3
f) The hospital has an approved process for appropriate communication of drug shortages and out-of-prescriptions and other healthcare professionals.	39	35.5	71	64.5

Table (4) shows the perception of the studied group with regard to effective drug selection and drug screening purchase, according to which "Medication List (Prescription Book) is Monitored, Maintained and Updated" table was the highest item performed (68.2%). While the highest item not implemented was "monitoring drug transportation to ensure that transportation complies with applicable laws and regulations, approved establishment policy, and manufacturer recommendations" (46.4%).

Table (5): Safe medication storage of medication inspection

Items	Not-done		Done	
	No	%	no	%
Store medicines safely and securely under the recommendations of the license holder	45	40.9	65	59.1
Store psychotropic substances, controlled drugs and narcotics in accordance with applicable laws and regulations	33	30.0	77	70.0
The hospital has an approved process for the use and storage of multi-dose of drugs to ensure their stability and safety.	34	30.9	76	69.1
The hospital has a clear process for dealing with power outages to ensure the safety of any affected drugs before they are used	42	38.2	68	61.8
Medicines in stores, pharmacies and patient care areas are checked periodically (at least monthly) to ensure they meet appropriate storage conditions.	37	33.6	73	66.4
Medicines, drug containers, and other solutions and ingredients used in their preparation are clearly labeled (if not on the original	27	24.5	83	75.5

packaging or boxes) with name, concentration/strength, expiration date, batch number, and any applicable warnings.				

Table (5) shows the depiction of the studied group with regard to the safe storage of drugs for examination of drugs, according to the table "Medications, packaging of drugs and other solutions and ingredients used in their preparation are clearly indicated (if not shown on the original packaging or boxes) by name, concentration / strength, expiration date and batch number And any applicable caveats" were the highest item accomplished (75.5%). While the highest item not implemented was "Store Medicines Safely and as Recommended by the License Holder" (40.9%).

Table (6): Emergency Medications inspection

Items	Not-done		Done	
	No	**%**	**no**	**%**
The hospital establishes and implements a policy and procedures to ensure the availability of emergency drugs in patient care areas that address at least the following: a) Emergency drugs should be readily accessible and uniformly stored to facilitate rapid access to appropriate medication to meet emergency needs.	52	47.3	58	52.7
b) Preventing the misuse, loss or theft of ambulance medicines to ensure their availability when needed.	41	37.3	69	62.7
c) Replacing emergency drugs at the most appropriate time when they are used, damaged or obsolete.	49	44.5	61	55.5
Emergency drugs are stored uniformly in all locations.	44	40.0	66	60.0
Emergency drugs are appropriately available and accessible easily when needed.	35	31.8	75	68.2
Emergency drugs are replaced within a predetermined time frame when they are used, damaged, or obsolete.	46	41.8	64	58.2

Table (6) shows the perception of the studied group with regard to the examination of emergency drugs, according to the table "Emergency drugs are adequately available and easily accessible when needed." It was the highest item done (68.2%). While the highest item not implemented was "emergency medications should be easily accessible and uniformly stored to facilitate rapid access to appropriate medication to meet emergency needs" (47.3%).

Table (7): Safe medication preparation and dispensing of medication inspection

Items	Not-done		Done	
	No	**%**	**no**	**%**
Patient information is available and accessible at all times to support an effective review process.	38	34.5	72	65.5
There are healthcare professionals who are permitted and qualified to perform reviews.	31	28.2	79	71.8
Review each prescription for suitability by a licensed pharmacist.	45	40.9	65	59.1

Each newly prescribed Drugs is reviewed for the following (where applicable): a) The suitability of the drug in terms of indication.	57	51.8	53	48.2
b) Dosing regimen including dose, frequency, method of administration and duration of treatment taking into account the physiological information of the patient.	45	40.9	65	59.1
c) Therapeutic duplication.	55	50.0	55	50.0
d) Variation from hospital standards for use.	45	40.9	65	59.1
e) Contraindications.	39	35.5	71	64.5
f) Real or potential allergies/sensitivities.	38	34.5	72	65.5
g) Actual or potential interactions between the drug and other drugs or food	49	44.5	61	55.5
h) Potential toxicity	45	40.9	65	59.1
There is a process for contacting the prescriber when questions or concerns arise.	48	43.6	62	56.4

Table (7) shows the perception of the studied group regarding safe drug preparation and drug examination dispensing, according to the "There are healthcare professionals who are permitted and qualified to perform reviews" table. It was the highest item done (71.8%). While the highest item not implemented was "Each newly prescribed drug is reviewed for the following (where applicable): a) drug suitability with respect to the indication." (51.8%).

Table (8): Medications are prepared safely

Items	Not-done		Done	
	No	**%**	**no**	**%**
Prepare drugs safely in clean, separate areas with appropriate medical tools and supplies, and comply with applicable laws and regulations and standards of professional practice.	36	32.7	74	62.3
The hospital identifies healthcare professionals who are authorized to prepare drugs for different situations.	35	31.8	75	68.2
The hospital has a system in place to provide medicines safely to meet the needs of the patient when the pharmacy is closed.	51	46.4	59	53.6
The hospital performs a process to guide the installation and preparation of sterile and non-sterile preparations.	40	36.4	70	63.6
All medicines prepared in the hospital are correctly classified and in a standardized way: a) Patient identifications (2 unique identifiers).	56	50.9	54	49.1
b) Medication name,	48	43.6	62	56.4
c) Strength /concentration,	53	48.2	57	51.8
d) Amount.	41	37.3	69	62.7
e) Expiration date,	57	51.8	53	48.2
f) Beyond use date,	60	54.5	50	45.5
g) Directions for use,	43	39.1	67	60.9

h) Any special/cautionary instructions	41	37.3	69	62.7
i) History of preparation and diluent of all combined intravenous additives and intravenous solutions (if any).	54	49.1	56	50.9

Table (8) shows the perception of the studied group with regard to the safe preparation of medicines, according to the table "The hospital identifies healthcare professionals who are licensed to prepare medicines for various cases" was the highest item that was made (68.2%). While the highest item not achieved was " All medicines prepared in the hospital are correctly classified and in a standardized way: after the date of use" (54.5%).

Table (9): Medicines are dispensed safely and accurately in accordance with laws and regulations

Items	Not-done		Done	
	No	%	no	%
The hospital is responsible for identifying the healthcare professionals who are allowed as per laws and regulations, qualifications, training, experience, and job description for drug dispensing.	34	30.9	76	69.1
The hospital has a unified system for dispensing and distribution medicines in accordance with applicable laws and regulations.	44	40.0	66	60.0
Psychotropic, control and narcotic substances are dispensed in accordance with applicable laws and regulations	39	35.5	71	64.5
Medicines are dispensed in the best form, ready for administration, and in quantities commensurate with the patient's needs and circumstances.	37	33.6	73	66.4
The hospital pharmacy has a process to provide education and medication advice (when needed) to patients and/or their families especially when patients are discharged from the hospital, patients are given an opportunity to ask questions.	48	43.6	62	56.4

Table (9) shows that the perception of the studied group with regard drugs are dispensed safely and accurately in accordance with laws and regulations, according to the table "The hospital is responsible for identifying these health care professionals allowed by law, regulation, qualification, training, experience, and job description of drug dispensing" was the highest item that was performed (69.1%). While the highest item is not made" (43.6%).

Table (10): Safe medication administration

Items	Not-done		Done	
	No	%	no	%
The hospital designates healthcare professionals, by law and regulations, with qualified training, experience and job description, who are authorized to administer drugs and additives, with or without supervision.	37	33.6	73	66.4
Safe medication management includes checking the following: a) Presence of a drug purchase order	46	41.8	64	58.2

b)Patient identifications (2 unique identifiers) .	53	48.2	57	51.8
c)Right medication	40	36.4	70	63.6
d)Reasons/indication of medication therapy .	52	47.3	58	52.7
e)Right dosage amount and regimen.	38	34.5	72	65.5
f)Right route of administration .	40	36.4	70	63.6
g) The appropriate time and frequency of administration.	42	38.2	68	61.8
h) Check with the patient who is allergic to any drugs	55	50.0	55	50.0
Psychotropic substances, controlled drugs and narcotics are given in accordance with applicable laws and regulations.	57	51.8	53	48.2
Patients are informed of the medications that will be administered to them, including their need, any potential adverse drug reactions, or other concerns about drug administration and are given an opportunity to ask questions.	40	36.4	70	63.6
Medications taken, refused, or deleted are recorded in the patient's medical record.	41	37.3	69	62.7
	54	49.1	56	50.9

Table (10) shows the perception of the studied group with regard to the safe administration of drugs, according to the table "The hospital appoints health care professionals, in accordance with the law and regulations, with qualified training, experience and job description, who are authorized to administer drugs and additives, with or without supervision" was the highest item completed performed (66.4%).While the highest not implemented item was "psychotropic substances, controlled drugs and narcotics in accordance with applicable laws and regulations" (51.8%).

Table (11): Effective medication monitoring

Items	Not-done		Done	
	No	%	no	%
The patient's response to medication is monitored according to the patient's clinical circumstances/status.	37	33.6	73	66.4
The hospital implements a process to monitor the response to the patient's first dose of new drugs during direct hospital care.	41	37.3	69	62.7
Actual or potential adverse drug effects on patients are monitored and documented in the patient's record, including actions to be taken in response.	43	39.1	67	60.9
Adverse drug events (ADES) are reported in a manner consistent with national and international guidelines.	37	33.6	73	66.4
The hospital implements the descriptor notification process when adverse (effects) occur	53	48.2	57	51.8

Table (11) shows the perception of the studied group with regard to effective drug monitoring, according to the table "The patient's response to medication is monitored according to the patient's clinical circumstances/status" and "Adverse drug events (ADES) are reported in a

manner consistent with national and international guidelines" was the highest Completed items (66.4%). While the highest item not implemented was "The hospital implements the descriptor notification process when adverse (effects) occur" (48.2%).

Table (12): Imminent medication errors and medication treatment problems

Items	Not-done		Done	
	No	**%**	**no**	**%**
The hospital has an approved policy to guide the identification, reporting, analysis and action of drugs errors, imminent, drug treatment problems based on national/international references.	17	15.5	93	84.5
pharmaceutical errors', near misses and pharmacotherapy problems were identified and reported to: a) Prescriber and/or other healthcare professional (as applicable).	41	37.3	69	62.7
b) Drug and therapeutics committee	49	44.5	61	55.5
c) Quality committee	37	33.6	73	66.4
d) Leaders of the hospital	51	46.4	59	53.6
The hospital uses reported near-misses medication errors, and medication treatment problems to improve medication management and program use.	20	18.2	90	81.8

Table (12) shows the perception of the studied group regarding Imminent medication errors and medication treatment problems "The hospital has an approved policy to guide the identification, reporting, analysis and action of drugs errors, imminent, drug treatment problems based on national/international references" was the highest item done (84.5%). While the highest not implemented item was 'pharmaceutical errors', near misses and pharmacotherapy problems were identified and reported to: hospital leaders (46.4%).

Table (13): Observational checklist about Medication error inspection

Dimensions	Good		Moderate		Low	
	no	**%**	**No**	**%**	**no**	**%**
Effective planning and management of medication	22	20.0	51	46.4	37	33.6
Antimicrobial Stewardship Program	41	37.3	37	33.6	32	29.1
Efficient medication selection and procurement	33	30.0	52	47.3	25	22.7
Safe medication storage	36	32.7	64	58.2	10	9.1
Emergency Medications	25	22.7	62	56.4	23	20.9
Safe medication preparation and dispensing	23	20.9	63	57.3	24	21.8
Medications are prepared safely	19	17.3	54	49.1	37	33.6
Medicines are dispensed safely and accurately in accordance with laws and regulations	49	44.5	35	31.8	26	23.6
Safe medication administration	27	24.5	41	37.3	42	38.2

Effective medication monitoring	44	44.5	27	24.5	39	35.5
Medication errors, imminent occurrences, and drug treatment problems	42	38.2	44	40.0	24	21.8
Total	27	24.5	69	62.7	14	12.7

Table (13) shows the perception of the studied group with regard to the dimensions of observation about the examination of medication errors, according to the table "Medicines are dispensed safely and accurately in accordance with laws and regulations" was higher after it was done (44.5%). While the lowest dimension was "preparing medicines safely" (17.3%). Finally, according to the 62.7 overall ratios, check the medication error with a medium score.
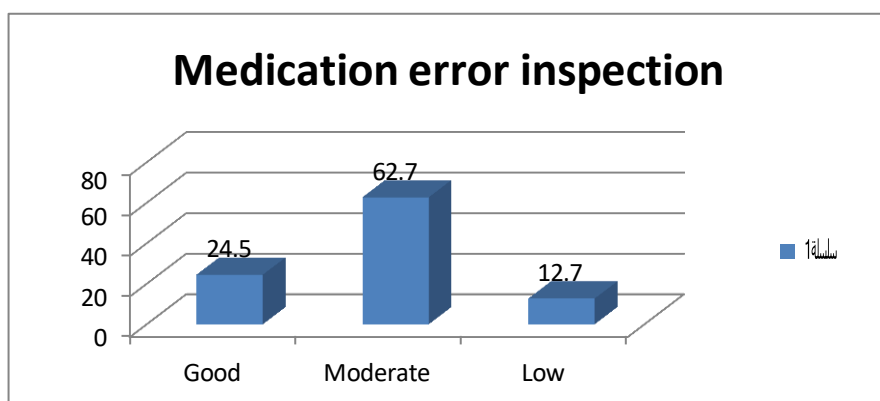

Figure (1) Medication error inspection

Figure (1) Medication error inspection, according to the figure, the moderate degree was the highest degree (62.7%).

Table (14): Observational checklist about Medication error inspection

Dimensions	Physician	Nurse	Pharmacist	Technician	F (p) value
Effective planning and management of medication	6.76±2.17	7.47±2.69	8.5±1.26	8.95±1.35	5.421 (0.002*)
Antimicrobial Stewardship Program	2.71±1.12	3.11±1.32	3.2±0.91	3.65±1.03	3.13 (0.029*)
Efficient medication selection and procurement	2.89±1.36	3.94±1.39	3.9±1.96	4.35±0.67	7.209 (0.001*)
Safe medication storage	3.8±1.16	4.11±1.12	3.9±0.99	4.4±1.14	1.423 (0.240)
Emergency Medications	3.15±1.24	3.61±1.07	4.3±0.82	4.1±1.16	4.814 (0.004*)
Safe medication preparation and dispensing	6.56±1.58	7.64±2.13	8.0±1.05	7.15±1.69	3.379 (0.021*)
Medications are prepared safely	6.86±2.15	7.67±2.3	8.5±1.84	7.65±2.18	2.018 (0.116)
Medicines are dispensed safely and accurately in accordance with laws and regulations	3.21±1.28	3.02±1.02	3.4±0.69	3.7±0.65	1.734 (0.164)
Safe medication administration	6.26±1.76	7.44±2.04	9.5±2.99	8.75±2.8	9.724 (0.001*)

Effective medication monitoring	2.54±1.14	2.85±1.07	4.4±0.84	4.05±1.19	13.816 (0.001*)
Medication errors, imminent occurrences, and drug treatment problems	4.23±1.14	4.14±1.45	6.1±0.99	6.5±0.61	20.747 (0.001*)
Total	49.02±5.4	55.05±7.1	63.7±5.6	63.25±5.1	34.939 (0.001*)

*Significant (P<0.05). (F) anova test

Table (14) shows a comparison between health care providers regarding the perception of monitoring dimensions about medication errors screening. According to the table, there is a statistical difference between all health care providers in most dimensions such as effective drug planning and management, antimicrobial stewardship program, effective drug selection and procurement, emergency drugs, safe drug preparation and dispensing, safe drug management, and efficacy. Monitor medication, Medication errors, imminent occurrences, and drug treatment problems & total; (p = 0.002, p = 0.029, p = 0.001, p = 0.004, p = 0.021, p = 0.001, p = 0.001, p = 0.001 & p = 0.001 respectively).

Table (15) Relation between studied group characteristics and Medication error inspection total score

Variable	Good	Moderate	Low	χ^2	(p) value
Age in Years					
<30	8(25.8)	19(61.3)	4(12.9)		
30 :< 40	12(24.5)	33(67.3)	4(8.2)	6.296	0.391
40 : <50	7(26.9	13(50.0)	6(23.1)		
50 : 60	0(0)	4(100)	0(0)		
Marital status					
Single	9(23.7)	24(63.2)	5(13.2)		
Married	10(18.5)	38(70.4)	6(11.1)		
Divorced	7(53.8)	5(38.5)	1(7.7)	10.833	0.094
Widowed	1(20.0)	2(40.0)	2(40.0)		
Gender					
Male	13(28.3)	26(56.5)	7(15.2)	(z)	
Female	14(21.9)	43(67.2)	7(10.9)	1.315	0.518
Educational level					
Nursing school	1(33.3)	2(66.7)	0(0)		
Technical institute	12(52.2)	11(47.8)	0(0)		
Bachelor degree	13(18.6)	47(67.1)	10(14.3)	22.290	0.004*
Master degree	1(7.7)	9(69.2)	3(23.1)		
Doctoral degree	0(0)	0(0)	1(100)		
Your Job in the hospital					
Physician	0(0)	34(73.9)	12(26.1)		
Nurse	6(17.6)	26(76.5)	2(5.9)		
Pharmacist	8(80.0)	2(20.0)	0(0)	56.637	0.001*
Technician (lab-ray)	13(65.0)	7(35.0)	0(0)		
Years of experience					
1-5 years	5(19.2)	17(65.4)	4(15.4)		

6-10 years	7(17.1)	30(73.2)	4(9.8)		
11-15 years	15(44.1)	15(44.1)	4(11.8)		
More than 15 years	0(0)	7(77.8)	2(22.2)		
Hospital provide medication administration training					
Yes	14(27.5)	33(64.7)	4(7.8)	(z) 2.169	0.338
No	13(22.0)	36(61.0)	10(16.9)		
Did you attend a workshop about drug management					
Yes	6(15.8)	23(60.5)	9(23.7)	(z) 7.334	0.026*
No	21(29.2)	46(63.9)	5(6.9)		
Importance of knowledge related to drug management process and medication error?					
Very important	13(23.6)	33(60.0)	9(16.4)	7.269	0.296
important	7(24.1)	18(62.1)	4(13.8)		
Not important	3(15.8)	15(78.9)	1(5.3)		
Not important any more	4(57.1)	3(42.9)	0(0)		

*Significant (P<0.05). x^2 Kruskal-Wallis tests   Z Mann-Whitney test.

Table (15) shows the relationship between the personal characteristics of the studied group and the overall result of the medication errors examination. There is a statistically significant relationship between the personal characteristics of the studied group and the overall drug error examination score in some factors with personal characteristics such as: educational level (p = 0.004), your job in the hospital (p = 0.001), years of experience (p = 0.047) and whether you are Have attended a workshop on medication management (p = 0.026).

Discussion

Results related to medication management process and dimensions.

Regarding effective drug planning and management, the current study. This result may be due to one of the following reasons: The hospital fails to develop drugs management and safety programs in accordance with applicable laws and regulations, and drugs management programs do not address all items from the order and description. The regulation, administration and use of medicines is also not in line with the scope of hospital services to meet the needs of patients in accordance with applicable laws and regulations.

Regarding the antimicrobial stewardship program, the current study. This finding may be due to one of the following reasons: The hospital educates staff, patients, and their families about the use and supervision of antimicrobials.

The hospital is also working on improvement opportunities identified in the Antimicrobial Stewardship Program. Finally, the hospital collects and analyzes data related to the antimicrobial stewardship and reporting program.

This result parallels that of Gebre et al., 2021 who found that the frequency of drug classes around antimicrobials was 22.2% of the total programs offered, and this result reflects

22

the importance of these programs to overcome medication errors.

According to the efficiency of drug selection and drug purchase, the current study. This result may be due to one of the following reasons: The institution establishes and implements a policy and procedures that define the list of drugs that are monitored, maintained and updated. The hospital also has an approved process for appropriate communication of drug shortages, out-of-prescriptions, and other healthcare professionals.

Regarding the safe storage of medicines, the current study. This result may be due to one of the following reasons: Psychotropic substances, controlled drugs and narcotics are stored in hospital in accordance with applicable laws and regulations. The hospital also has an approved process for the use and storage of multi-dose drugs to ensure their stability and safety.

According to these results, the study that focused on storage errors, a retrospective study in Saudi Arabia observed 2073 of them. They concluded that analysis of prescriptions was the key factor in reducing drugs errors and that pharmacists' participation in the clinical indication process for medications and patient history prior to distribution is fundamental to patient safety. While the analysis of drug storage and dispensing was the least factor in the occurrence of medication errors and accidents (Al-Khani, Muharram, Al-Jadi, 2014).

Concerning the examination of emergency drugs the current study. This result may be due to one of the following reasons: Emergency drugs are available and accessible in clinical areas when needed. The hospital also develops and implements a policy and procedures to prevent emergency drugs from misuse, loss or theft and to make them available when needed.

These findings are supported by the findings of a study that analyzed the role of the multidisciplinary team in the emergency drug management process. In one of them, 526 potential drug interactions were identified in 159 prescriptions (79% of the prescriptions analyzed). Of these, 109 (21%) were serious interactions; 354 (67%) moderate; 63 (12%) mild; 41 prescriptions showed no drug interactions. (Miro, Oliveira, Fonseca, Meninil, Zim-Mascarenhas, Machado, 2018).

This result may be due to one of the following reasons: There are qualified healthcare professionals to perform appropriate reviews. Also see the hospital for real or potential allergies/sensitivities to each drug.

In the same line two studies examined the effects of drug dispensing. Using a prospective, observational, and before-and-after study, Dean & Barber 2000 evaluated the effects of patients using their drugs in the hospital compared to pharmacists introducing their

supplies into the clinical setting. In general, there was a moderate to good level of practice in the drug dispensing procedures. Using a prospective study before and after (Schimmel et al., 2011).

Regarding Medications are prepared safely, the present study . This result could be due to one of the following reasons: the hospital failed to prepare medications in a correctly labeled in a standardized manner with Patient identifications (2 unique identifiers). Also hospital sometimes doesn't review the expiration date nor the Beyond use date.

The work of Mieiro, Oliveira, Fonseca, Mininel, Zem- Mascarenhas, and Machado, 2018 is consistent with these findings as they state that medications may not be prepared safely due to some factors that contribute to these errors occurring mostly during the morning, including that the nursing staff perform several Activities during this period, so that it is not limited to the preparation and administration of medicines. In the morning, the medical team reevaluates patients, changes prescription data, and orders lab tests, which can lead to greater workload and overburden/distraction for the nursing team responsible for preparing and administering medications.

Regarding medicines, they are dispensed safely and accurately in accordance with the laws and regulations, the current study. This result may be due to one of the following reasons: The hospital is responsible for determining the healthcare professionals allowed by law and regulations, qualifications, training, experience, and job description for drug dispensing. Medicines are also dispensed in the correct form for administration and in quantities commensurate with the patient's needs and circumstances.

Good deal with 2013 Morrison concludes that dispensing errors occur when dispensed drugs differ from prescription drugs. This results when the application is misinterpreted either in terms of the drug term itself, dose or quantity.

Regarding effective drug control, the current study. This result may be due to one of the following reasons: The patient's response to his medication is monitored according to the patient's clinical circumstances/status. Harmful drug use is also reported in a manner consistent with national and international guidelines.

This finding parallels with Elsehrawy, Gaber & Adam, 2015 who summarized their findings where supervisor monitoring practices and procedures that promote patient safety can be considered high, as older nurses are more satisfied with managers' support because they accept that older nurses can be more Knowledgeable, demonstrating more positive attitudes towards safety and possibly more commitment to work than younger workers. Contrary to

these findings, Nichtsri, Ramya and Kishore, 2017 found that monitoring of drug interactions with drugs and errors related to ineffective monitoring could be considered high (40.3%). Adverse events have also not been properly reported.

Concerning drugs errors, imminent occurrence, and drug treatment problems, the current study. This finding could be due to one of the following reasons: The hospital has an approved policy to guide the identification, reporting, analysis and action of medication errors, near misses, and medication treatment problems based on national/international references. The hospital also uses reported near-misses medication errors, and drugs treatment issues to improve drugs management and program use.

The finding of the present study may be interpreted as some factors of the personal attributes can make a difference in the perception of Medication error and management.

This result is parallel to the study that concluded that different experiences between health care providers were important and that there are some specific characteristics, the research has shown that the involvement of key people in the drug processes, so that they are given greater flexibility to design solutions to a specific problem that exist in organizations significantly .

References

1. Agalu A, Ayele Y, Bedada W, Woldie M. Medication administration errors in an intensive care unit in Ethiopia. *Int Arch Med*. 2012;5 (1):15. doi:10.1186/1755-7682-5-1

2. Al-Khani S, Moharram A, Aljadhey H. Factors contributing to the identification and prevention of incorrect drug prescribing errors in outpatient setting. Saudi Pharm J. 2014;22(5):429-32.

3. Cousins DH, Gerrett D, Warner B. (2010). A review of medication incidents reported to the National Reporting and Learning System in England and Wales over 6 years (2005–2010). Br J ClinPharmacol. 2012; 74(4):597–604.

4. Dalmolin GR, Rotta ET, Goldim JR. Medication errors: classification of seriousness, type, and of medications involved in the reports from a University Teaching Hospital. *Braz J Pharm Sci*. 2013;49 (4):793–802. doi:10.1590/S1984-82502013000400019 36.

5. Dean B and Barber N. The effects of a patient's own drugs scheme on the incidence and severity of medication administration errors. *Int J Pharm Pract* 2000; 8: 209–216.

6. Dorothy A, Yadesa TM, Atukunda E. Prevalence of medication errors and the

associated factors: a prospective observational study among cancer patients at Mbarara regional referral hospital. *Cancer Manag Res*. 2021;13:3739–3748. doi:10.2147/CMAR.S307001.

7. Flynn, L., Liang, Y., Dickson, G. L., Xie, M., &Suh, D.-C. (2012). Nurses' practice environments, error interception practices, and inpatient medication errors. Journal of Nursing Scholarship: An Official Publication of Sigma Theta Tau International Honor Society of Nursing / Sigma Theta Tau, 44(2), 180–6.

8. Gebre M., Addisu N., Getahun A., et al., 2021; Medication Errors Among Hospitalized Adults in Medical Wards of Nekemte Specialized Hospital, West Ethiopia: A Prospective Observational Study. Drug, Healthcare and Patient Safety. *downloaded from https://www.dovepress.com/ by 95.185.182.53 on 29-Dec-2021 For personal use only.*

9. Goedecke, T., Ord, K., Newbould, V., Brosch, S., &Arlett, P. (2016). Medication errors: new EU good practice guide on risk minimization and error prevention. Drugsafety, 39(6), 491-500.

10. James, J. T. (2013). A new, evidence-based estimate of patient harms associated with hospital care. Journal of Patient Safety, 9(3), 122–8.

11. Kebede B, Kefale Y. Medication error patients admitted to medical ward in primary hospital, Ethiopia: prospective observational study. *J Pharma Care Health Sys*. 2019;6(205):2376–0419.

12. Lemos NRF, Silva VR, Martinez MR. [Factors that predispose to the distraction to the team of nursing during preparation and the administration of medicines]. REME: Rev Min Enferm. 2012;16(2):201-7. Portuguese.

13. Lisby M, Nielsen LP, Mainz J. Errors in the medication process: frequency, type, and potential. *Int J Qual Health Care*. 2005;17 (1):15–22. doi:10.1093/intqhc/mzi015

14. lsehrawy M.G., Gaber H., Adam S.M., 2015. Nurse's Awareness Regarding Patient Safety Culture at Mansoura University Hospital. *Mansoura Nursing Journal (MNJ) : vol.2 No.1 ISSN: 18235-2015*

15. Medication Administration and the Complexity of Nursing Workflow. Paper presented to the Proceedings of the Institute of Industrial Engineers Society of Health Systems Conference, Chicago Tau International Honor Society of Nursing / Sigma Theta Tau, 44(2), 180–6.

16. National Quality Measures Clearinghouse (NQMC). (2013). Agency for Healthcare Research and Quality, Rockville, MD. Retrieved from http://www.ahrq.gov/cpi/about/otherwebsites/qualitymeasures.ahrq.gov/index.html.

Garrett, R. and Craig, J. (2009)

17. NIKHITHASRI P., RAMYA M., KISHORE P., 2017; ASSESSMENT OF MEDICATION ERRORS IN PEDIATRICINPATIENT DEPARTMENT OF A PRIVATE HOSPITAL. International Journal of Current Pharmaceutical Research. Vol 9, Issue 6, 2017. ISSN- 0975-7066.

18. Okuno MFP, Cintra RS, Vancini-Campanharo CR, Batista REA. Drug interaction in the emergency service. Einstein [Internet]. 2013 [cited 2017 Sep 25];11(4):462-6. Available from: http://dx.doi.org/10.1590/S1679-45082013000400010. English, Portuguese.

19. Samp, J. C., Touchette, D. R., Marinac, J. S., &Kuo, G. M. (2014). Economic evaluation of the impact of medication errors reported by u.s. clinical pharmacists. Pharmacotherapy, 34(4), 350–357. http://doi.org/10.1002/phar.1370

20. Schimmel AM, Becker ML, van den Bout T*, et al*. The impact of type of manual medication cart filling method on the frequency of medication administration errors: a prospective before and after study. *Int J Nurs Stud* 2011; 48: 791–797.

21. Thomas, B., Paudyal, V., MacLure, K., Pallivalapila, A., McLay, J., El Kassem, W., ... & Stewart, D. (2019). Medication errors in hospitals in the Middle East: a systematic review of prevalence, nature, severity and contributory factors. European journal of clinical pharmacology, 75(9), 1269-1282.