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Medication Errors and its Contributing Factors among Critical Care Nurses

A Thesis Submitted

By

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Supervised by

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بسم الله الرحمن الرحيم

لَا يُكَلِّفُ اللَّهُ نَفْسًا إِلَّا وُسْعَهَا ۚ لَهَا مَا كَسَبَتْ وَعَلَيْهَا مَا اكْتَسَبَتْ ۗ رَبَّنَا لَا تُؤَاخِذْنَا إِن نَّسِينَا أَوْ أَخْطَأْنَا ۚ رَبَّنَا وَلَا تَحْمِلْ عَلَيْنَا إِصْرًا كَمَا حَمَلْتَهُ عَلَى الَّذِينَ مِن قَبْلِنَا ۚ رَبَّنَا وَلَا تُحَمِّلْنَا مَا لَا طَاقَةَ لَنَا بِهِ ۖ وَاعْفُ عَنَّا وَاغْفِرْ لَنَا وَارْحَمْنَا ۚ أَنتَ مَوْلَانَا فَانصُرْنَا عَلَى الْقَوْمِ الْكَافِرِينَ

صدق الله العظيم

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Supervisor Certification

I certify that the thesis entitled: (**Medication Errors and Its Contributing Factors Among Critical Care Nurses)** submitted by to the University of Babylon, College of Nursing in partial fulfillment of the requirements for the Degree of Master in Nursing Sciences. The thesis work was carried out by the student under my supervision and guidance.

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We, the examining committee, certify that we have read this thesis (**Medication Errors and its Contributing Factors among Critical Care Nurses**), submitted by student **Asmaa Jabbar Sahib**, from the department of Adult Nursing, and we have examined the student in its contents, and what is related to it and we decide that it is adequate for awarding the degree of **Master** in (**Nursing sciences)** with specialty of (**Adult Nursing)** and estimated of ( ) on / / 2023**.**

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Dedication

I dedicate this humble work to:

Who led the hearts of humanity and their minds to the safe haven, the first teacher of mankind, **Mohammad** (may God bless him and his family and grant him peace)

My dear father and dear mother, who supported me psychologically and morally, my refuge and my shadow when I was tired

My brothers and sisters who are the source of my pride

My beloved husband for understanding supporting me throughout my study

The seed of my heart and my hope for tomorrow my sweet daughter **Lujain**

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to bless them all

Abstract

Medication errors can have a variety of different effects that lead to higher patient mortality and morbidity, longer hospital stays, and higher financial demands.

To find out the relationship between medication errors and contributing factors, and examine the variations in medication mistake in relation to the socio-demographic traits of the nurses.

A descriptive cross-sectional study conducted in Hilla city during the period from October 1st 2022 to Jun 15th 2023. The study sample consist of 150 nurses working in critical care units is selected according to non-probability sampling approach. Experts validated the questionnaire's validity, and a pilot study confirmed the reliability of the results. Data were collected through the self-report.

The findings indicated that the majority of the study sample (88.0%) from 20 to 29 years. More than half of nurses were female, (54.0.%), and marital status, the higher percentage (54.0%) were single, and (57.3%) were Bachelor, and the experience years less than 5 years were the higher percentage (76.7%), working hours the less than 8 hrs. were the large percentage(52.7%) and the morning shift were the more (52.7%), and the work place were RCU (71.3%). The correlation indicates to significance relationship between medication error and its contributing factors (p= .000).

The result show that there are significant differences between sociodemographic data (gender, working hours, and working shift).

The study concluded that the average of the medication errors occurrence among critical care nurses is moderate.

Educating medical personnel about medication errors through professional training programs and seminars.

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List of Abbreviation

Items	Meaning
ADEs	Adverse Drug Events
ASHP	American Society of Health System Pharmacy
BCMA	Barcode Medication Administration
CNO	Chief Nursing Officer
CPOE	Computerized Physician Order Entry
DERS	Dosage Error Reduction Software
ICU	Intensive Care Units
LASA	Look- Alike, Sound- Alike
MAEs	medication administration errors
MAP	Medication Administration Process
MDE	Medication Dispensing Error
MEs	Medication errors
NCCMERP	National Coordinating Council for Medication Error Reporting and Prevention
PSI	Patient Safety Incident
WHO	World Health Organization
WTEs	Wrong Time Errors

List of Appendices

List of Statistical Symbols

Items	Meaning
F	Frequency
%	Percentage
SD	Standard Deviation
MS	Mean Score

Chapter One

Introduction

Chapter One

Introduction

1.1. Overview

Ensuring patient safety and providing high-quality treatment are crucial elements of effective healthcare systems. The primary objectives of healthcare professionals are to satisfy individual patient needs in order to increase patient safety, which in turn elevates the standard of care. A key indicator of the quality of healthcare, among all patient-centered needs, is the safety of medicine administration (Salami, 2019).

Medication errors are any patient safety incident (PSIs) that occur during the prescription, preparation, dispensing, administration, monitoring, or advice-giving phases of the medication process Any unintended or unanticipated event that could have or actually did cause harm to one or more patients getting medical care is referred to as (PSI)(Bifftu & Mekonnen, 2020).

Globally, unsafe drug practices are the main factor in patient damage. A vital step is the administration of medications to patients, as a mistake at this point could directly hurt a patient and have a significant negative effect on the staff member administering the medication(Jessurun, 2022).

Different health care personnel make medication errors; doctors typically make them during the prescribing phase, whereas nurses more frequently do so during the administration phase (Kareem Azeez & Zaki Shaker,2018).

Medication administration errors (MAEs) are the most common drug errors that can have detrimental effects on Healthcare consumers, professionals, and facilities. The nurse is primarily in charge of administering prescriptions, and they can commit up to 40% of their time to this job (Wondmieneh, 2020).

Medication errors can happen at several stages of patient care provided by both medical professionals and paramedics; nurses are particularly prone to making a lot of mistakes. Intensive care units (ICUs) include professionally skilled medical professionals and paramedics, yet 52.5% of errors are recognized (Alshahrani A, 2021).

MEs are the most frequent medical errors, Patients hospitalized to critical care units have higher rates of morbidity and mortality, making them more susceptible to harm from medication mistakes, AE rates in critical care units 80.5% per (1,000) patient-day (Santos, 2020).

Any of the 10 rights, which are: the correct patient, the proper drug, right time, right dosage, right route, right education and advice, right to reject, right assessment, right evaluation and reaction, and documentation, might be violated, leading to a drug error (khalil N, 2022).

Such errors could be brought on by the procedures or methods used by healthcare professionals, the items or medications they use, or the systems they use, such as prescriptions, misunderstandings, labeling, packaging, and nomenclature, as well as the assembly, distribution, and administration processes (Nkurunziza *et al*, 2020).

There are numerous causes of medication errors, including a heavy workload, a lack of knowledge, a failure to follow policies and procedures, improper communication, problems with various systems, variations in training standards, anxiety, a tendency to deviate from paying attention,

interruptions, and distractions, as well as inadequate staffing (Raja *et al*, 2019).

MEs are also influenced by physical and environmental variables, such as a lack of medical equipment and space for making, storing, and documenting drugs. Other factors that are connected to MAEs include the lack of privacy in nurses' work areas, which led to interruptions of medical staff by patients, family, visitors, and phone calls during the preparation and administration of medications were significantly impacted by poor communication between nurses and other healthcare professionals, including doctors and pharmacists (Aziz *et al*, 2018).

To reduce errors from the beginning of the medicine administration process to the moment of administration, nurses must be supported. Telephone calls, patients, or other staff members shouldn't be made when nurses are administering medication. Encourage them to complete the necessary drug administration procedures, including the medication administration record (MAR) and the correct identification procedure (Al Khreem & Al-khadher, 2021).

1.2. Importance of Study

The challenges to patient safety in the medication distribution process in healthcare settings, where experts collaborate in multidisciplinary teams using advanced instruments, cannot be overstated. It is never the goal of any phase in the medicine distribution process to cause new issues; rather, it is to help patients who are ill and suffering. Medication mistakes risk patient safety and the objective of treating patients' diseases with medication. The greatest risk in the delivery of medicines to patients is medication administration errors (Ayuk *et al*, 2016).

World health organization puts them in its 6-priority list for researches related to patient safety (WOH, 2009).

Medication mistakes can have a variety of different effects it led to higher patient mortality and morbidity, longer hospital stays, and higher financial demands. states that about every two out of every 100 hospitalized patients have a preventable adverse drug event, and that medication errors cause over 7000 annual deaths in the USA. These mistakes reduce the patients' pleasure and trust in the healthcare system, and they can be psychologically painful for the nurse who made them (Alanko & Nyholm, 2007)**.**

Medication errors are viewed as a severe global issue. They rank among the top 10 killers globally. They are also regarded as one entity. among the most prevalent reasons for morbidity and mortality available in hospitals (Yousef et al., 2022).

In hospitals around the world, medication administration errors (MAE) afflict 18.7%-56% of patients (Nkurunziza *et al*, 2020).

Medication errors (MEs), which account for 10–18% of total errors and can have catastrophic consequences for patients and even cause death (Fathi *et al*, 2017).

Numerous researches on pharmaceutical errors may help nurses treat patients more effectively, and it's important to record errors when they occur to avoid repeating them (Aimable,2017).

After cancer and cardiovascular illnesses, poor patient safety in healthcare systems is the third most common cause of death worldwide and in the US (MAEs) result in minimum one death and 1.3 million injuries every day, it is estimated that drug errors cause more than 250,000 fatalities

annually, the projected annual cost of MAEs is roughly $42 billion USD worldwide (Alamrani, 2021).

1.3. Problem of the Study

Medication error was identified as the administration of a dose that was not in accordance with the prescription on the patient's medical file. These medication errors were seen as system flaws (i.e., results that were different from those the system was intended to deliver and administer to the patients) (Barker et al, 2002).

A drug-related negative incident is a harm brought on by a drug-related medical procedure. Sometimes medication errors are linked to ADEs. The consequences of ADEs and medication errors can be severe, expensive, and even fatal, Drug mistakes can cause patient harm or inappropriate pharmaceutical use while the patient or healthcare provider is in charge of the medication. They are preventable events. Medication errors can cause harm, additional costs, and even fatalities in hospitalized patients (Ciapponi *et al*., 2021).

There is always a chance for professional nurses to make a mistake in their routine nursing procedures, potentially risking the safety of their patients. Due to the intricacy of the pharmaceutical administration process, mistakes may happen at any one, all, or even just some of the steps between prescription and administration (Haile *et al*, 2022).

Nurses spend more time with patients than the majority of other healthcare professionals, and they play important roles in drug management and patient safety improvement consequently, determining the pattern, prevalence, and contributing factors to the occurrence of ME (Marznaki *et al*, 2020).

Intensive care units (ICUs) are more susceptible to mistakes and their outcomes, which could be more severe for ICU patients, an average of 1.7 medical errors are made every day by severely sick patients admitted to the ICU., and many patients experience a mistake that could endanger their lives while they are there. Medication mistakes make up the majority of significant medical mistakes in the intensive care unit (78%) (Escrivá Gracia et al, 2019).

1.4. Objectives of the study

1. Determine the medication errors and its contributing factors among critical care nurses.
2. Find out the association between medication errors and contributing factors.
3. Investigate the differences in medication error with regards nurse's socio-demographic characteristics such as (age groups- the gender- marital status - educational level- experience years- work shift).

1.5. Study Questions

1.5.1. What the most frequent medication errors and contributing factors among nurses?

1.5.2. Are there association between medication errors and its contributing factors?

1.5.3. Are the demographical characteristics effect of occurrence the medication errors?

1.6. Defining of the Terms

1.6.1. Medication Error

Theoretical definition

A medication error is an unintentional failure in the drug-treatment process that puts the patient in danger or raises the possibility of putting them in danger (Goedecke, T., 2016).

Operational

Any unintended mistake made when a medical professional, patient, or consumer prescribes, dispenses, or administers or prepares for administration a pharmaceutical substance.

1.6.2. Factor

Theoretical definition

one that actively contributes to the production of a result. and it's the factors that contribute to errors and affect the quality of health care(Shahrokhi, A., 2013).

Operational:

A circumstance that affects the impact by making it more likely to happen, quickening the process, changing the severity of the repercussions, etc. Removing the contributing factor(s) won't make the effect go away.

1.6.3. Critical Care Units

Theoretical:

Specialized unit cares for patients whose conditions are critical or life-threatening and require all-encompassing treatment and ongoing monitoring (Williams & Leslie, 2005)**.**

Operational:

A hospital section with thoughtful design that is home to extremely ill patients.

Chapter Two

Review of Literatures

Chapter Two

Review of Literatures

2.1. Overview

In the United States, medication use is very common. In a major national study, 81% of respondents said they had taken a medication in the week before, and 50% said they had used at least one prescription drug(Kaufman et al.,2002).

Modern pharmacotherapy is complicated, which makes it easy for patients to become confused and for medical practitioners to make mistakes(Makaryus & Friedman, 2005).

According to the Institute of Medicine, medication errors in the United States result in 44,000 to 98,000 fatalities annually. According to the World Health Organization's 2017 estimate, drug errors can cost as much as $42 billion annually worldwide. Thus, among medical errors that frequently occur in acute care settings, MAEs were(Kerari & Innab, 2021).

A medical error is simply a mistake or incorrect action throughout the course of treating a patient's disease. Every known medical illness has a minimum degree of care or a standard of care. If a medical professional complies with this criterion but nonetheless commits a mistake as a result of unusual or unforeseen circumstances involving the patient, this is considered an error rather than medical negligence(Dumitru *et al*.,2021).

Medication administration errors, such as incorrect drug calculations (both during prescribing and administration), timing issues, improper

preparation, and administration to the wrong patient, show that dosing errors are the most frequent errors in pediatric units, with the prescribing and administration stages being the ones where errors are most likely to happen. Leape (2005) found that the administration phase was responsible for one-third of errors, which is consistent with this. Nursing staff is essential to this procedure since they are in charge of four of its five steps. As a result, nurses are more likely than any other profession involved in medicine administration to report problems(Bower *et al*., 2015).

If nurses lack the required expertise on the skills and knowledge required for the health and life protection for people, medical Errors become commonplace. Along with these, factors including the inadequate number of nurses working diligently in the workplace circumstances, lack of sleep, fatigue, and attention, an unclear job description, and instability hours of work, unhealthy physical conditions, having a lot of patients who are attentive, cause medical error(Korhan et al., 2017).

Poorly drafted instructions, calculation errors, administration problems, insufficient paperwork, a lack of adequate patient knowledge, a nursing shortage, and failing to Instruments like infusion pumps(Mrayyan *et al*., 2007).

Measuring medication administration errors involves a variety of techniques, including self-reporting, incident reporting, reviewing medical records, using trigger tools, and direct observation. Each has benefits and drawbacks of its own. The prevalence of pharmaceutical administration errors is overestimated by incident reporting and self-reporting techniques. The best technique for correctly identifying a wide range and considerable

number of medicine delivery errors is direct observation. This makes it possible to compare the prevalence of medication administration errors across published research. This approach's drawback is because it requires more work, is more expensive, and might cause participants to behave differently while observers are there(Assunção-Costa *et al*., 2022).

2.2. Definition of Medication

The drug define As a chemical molecule with a recognized structure that is not a nutrient or a necessary dietary component and that, when given to a living organism, exerts a biological effect Drugs can be made of biotechnological products (biopharmaceuticals), synthetic chemicals, or chemicals derived from plants or animals. A chemical preparation known as a medication is given with the goal of having a therapeutic effect. It typically, but not always, comprises one or more medicines. In order to make medications more convenient, they frequently contain additional ingredients (excipients, stabilizers, solvents, etc.) in addition to the active ingredient(Ritter *et al*., 2020).

In the United States, medications are usually dispensed on the order of primary care providers and dentists. In some U.S. states, specially qualified nurse practitioners or other advanced practice nurses and physician assistants may prescribe drugs. The written direction for the preparation and administration of a drug is called a prescription. One drug can have as many as four kinds of names: its generic name, trade name (or brand name), official name, and chemical name. The generic name is assigned by the United States Adopted Names (USAN) Council and is used throughout the drug’s lifetime. A drug’s trade name (sometimes called the brand name) is

the name given by the drug manufacturer and identifies it as property of that company(Adams, 2013).

2.3. The Action of a Medications in The Body

The action of a drug in the body can be described in terms of its half-life, the time interval required for the body's elimination processes to reduce the concentration of the drug in the body by one-half. Because the purpose of most drug therapy is to maintain a constant drug level in the body, repeated doses are required to maintain that level. When an orally administered drug is absorbed from the gastrointestinal (GI) tract into the blood plasma, its concentration in the plasma increases until the elimination rate equals the rate of absorption. This point is known as the peak plasma level When a drug is given intravenously (IV), its level is high immediately after administration and decreases through time. Another dose is given in order to maintain therapeutic levels. If the client does not receive another dose of the drug (either orally or IV), the concentration steadily decreases (Zeeshan & Dua, 2020).

Key terms related to drug actions are as follows, onset of action: the time after administration when the body initially responds to the drug ,peak plasma level: the highest plasma level achieved by a single dose when the elimination rate of the drug equals the absorption rate, drug half-life (elimination half-life): the time required for the elimination process to reduce the concentration of the drug to one-half what it was at initial administration, plateau: a maintained concentration of a drug in the plasma during a series of scheduled doses, Pharmacodynamics refers to the relationship between drug concentration at the site of action and the resulting effect, including the time

course and intensity of therapeutic and adverse effects. while pharmacokinetics is the study of the absorption, distribution, biotransformation, and excretion (Zeeshan & Dua, 2020).

2.4. Route of Medication Administration

Most drugs can be administered by a variety of routes. The choice of appropriate route in a given situation depends both on drug as well as patient related factors, mostly common-sense considerations, feasibility and convenience dictate the route to be used Routes can be broadly divided into those for;-

A- Local routes These routes can only be used for localized lesions at accessible sites and for drugs whose systemic absorption from these sites is minimal, The local routes are, (Topical, Deeper tissues, Arterial supply) (Barber, P., 2020).

B- systemic routes The drug administered through systemic routes is intended to be absorbed into the blood stream and distributed all over, including the site of action, through circulation , systemic routes are :-

a- Enteral route;- in this route the drug is placed in the Gastrointestinal Tract and then it absorbs to the blood. This route is further classified into three classes:(1. Oral, 2. Sublingual, 3. Rectum)(Verma et al., 2010).

b- Parenteral ;-in this route of administration the drug does not pass through the gastrointestinal tract. It directly reaches to the blood, its classified in to;- (1. Intravascular, 2. Intramuscular, 3. Subcutaneous, 4. Inhalation) (Verma et al., 2010).

2.5. The Medication Administration Process

The medication administration process (MAP) can be represented in six stages, from ordering, transcribing, dispensing, preparing, administering and observing. (Odberg *et al*., 2020)

1) Ordering is when the physician decides what medicines to prescribe, with details such as dosages and timing. This is often done in collaboration with the registered nurse.

2) Transcribing is the formalizing of the orders into an electronic medication administration system.

3) Dispensing is when the registered nurse checks the prescribed medication list against the electronic medication administration system and dispenses the medicines in pill boxes.

4) Preparing is when the registered nurse readies the medication for ingestion and performs a double-check before administration.

5) Administering is the actual delivery of medications to patients.

6) Observing entails monitoring the patients for effects after they take the medicines and the subsequent documentation. (Odberg, 2020)Nurses use a technique called nursing medication management to help patients understand the value of taking their medications as prescribed and avoid any side effects that could come from using their meds incorrectly and endangering their treatment. The adoption of medication safety is focused on errors that occur in drug management and administration in addition to patients' correct

medication use in order to increase patient care quality and ensure patient safety during pharmaceutical treatments(Doan ,D.Q., 2022).

Since registered nurses play a crucial part in patient pharmaceutical treatments and informally handle medication administration, a set of skills called medication knowledge is necessary for nursing performance (Luokkamäki et al., 2021)

2.6. The Ten "Rights" of Medication Administration

The rights to safe medication administration are standards outlined by professional organizations that are intended to safeguard the medication administration process for both nurses and patients, The CNO (2015) outlined eight rights as a practice standard for nurses related to the medication administration process that include: the right client, the right medication, the right reason, the right dose, the right frequency, the right route, the right site, and the right time. Other literature identified these practices as the five rights, Following the rights to safe medication administration implies that a medication error will not occur and that the safety of the patient will be maintained, Although the rights to safe medication administration have been a standard of practice for, researchers are beginning to notice that these rights are not the be all and end all to safe medication This means that following the rights will not necessarily prevent a medication error from occurring as a multitude of factors, such as patient characteristics, can play a role (Medved, 2016)

Medication errors can be caused by infractions of any of the ten rights, which are: the right patient, the right medication, the right time, the right dose, the right route, the right education and advice, the right to refuse,

the right assessment, the right evaluation and response, and documentation(Dolly,A., 2017)

According to fundamental nursing these rights are

1- Right medication, the drug that was administered was the one that was prescribed.
2- Right dose, the prescribed dose is suitable for the patient.
3- Right time, Administer the drug at the prescribed frequency and time in accordance with agency policy.
4- Right route, Administer the drug using the prescribed method.
5- Right client, the intended client receives the medication.
6- Appropriate client education, Inform the client about the drug.
7- Appropriate documentation, Record the administration of medication only after it has been administered.
8- Refuse right; Adult patients have the option to reject any drug. The nurse's responsibility is to make sure the patient is fully aware of the potential repercussions of refusing and to inform the healthcare provider of the patient's rejection.
9- Appropriate assessment, some drugs call for particular evaluations before administration (e.g., apical pulse, blood pressure, lab results).
10- Appropriate evaluation, Follow up as necessary(Fundamentals of Nursing 10e).

Although nurses have a far more extensive role in giving medications than rule-following, nurses' adherence to the five to ten rules or "rights" of medication delivery safety is investigated (Rohde,E., 2018).

A drug error may involve a combination of human, system, and environmental errors rather than just one of them. Ten rights are proposed to ensure a multiprotection, evidence-based, and streamlined approach to decreasing errors (sharon,E., 2015).

2.7. Medication errors

2.7.1 Definition

Medication errors as any type of avoidable mistake that could result in improper medication use or patient harm while the medication is under the control of the healthcare professional, patient, or consumer. It can refer to professional practice, healthcare items, methods, and systems, as well as ordering, transcribing, and dispensing.by The National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP, 2015) (Ayorinde ,M.Q., 2019).

Medication error was defined as "a ‘failure in the drug treatment process that leads to, or has the potential to cause, harm to the patient and includes an act of omission or commission." mission Omissions (drugs not administered or administered late), substitutions (incorrect drugs administered instead of intended drugs), repetitions (additional doses given), and incorrect routes (drugs administered that were not attended at that time or at any stage) are the four types of medication errors (Litman, 2018).

American Society of Health System Pharmacy (ASHP) defines a medication error as "a dose of medication that deviates from the physician’s order as written in the patient’s chart or from standard hospital policy and procedures".

2.8. Types of medication errors

It's critical to categorize medication errors. It aids in the development of strategies to enhance the process of using medications and reduce the incidence of medication errors, as well as the frequency and severity of errors. Some reporting systems categorize medication errors based on the steps of the medication usage process, while other systems place more emphasis on the severity and result of the error. Additionally, there are subcategories of pharmaceutical errors based on the profession committing the error or the specific substance implicated in the error(Brady *et al*., 2009).

According to where they occur during the medication usage process, medication errors are divided into five stages: prescribing, transcribing, dispensing, administration, and monitoring(Allan,E.L., 1990).

Medication errors can be divided into two categories: prescription errors and preparation errors related to the preparation and administration(Rejane et al., 2013) .

2.8.1. Prescribing error

"Clinically significant" Prescription mistakes happen when, unintentionally, there is a considerable decrease in the likelihood that treatment will be timely and effective or an increase in the risk of relative to generally accepted procedure, damage(Velo,M., 2009).

Prescription errors include those involving the act of writing a prescription, while prescribing errors include irrational prescribing, inappropriate prescribing, under prescribing, over prescribing, and ineffective prescribing, resulting from incorrect medical judgment or

decisions about treatment or treatment monitoring. Correct prescribing arises from minimizing errors and actively attempting to provide improved prescribing, both of which must be done(Dean,F., *et al*., 2005; Lesar *et al*., 1998).

According to previous studies, the reported rates of prescribing errors varied significantly as a result of differences in how a prescribing error was defined. They were 0.6% to 48% in size.(Lisby et al., 2005) (Pastó-Cardona *et al*., 2009) (Patanwala *et al*., 2010) (Vazin & Delfani, 2012) (Sinha *et al*., 2016).

Prescription errors might account for up to 11% of all written orders, costing the UK economy almost £400 million annually. the improper dosage form, wrong mode of administration, and drug selection were the most common prescribing errors (14.3%), followed by dose omission, timing, and instruction errors (9.5%).(Lisby et al., 2005).

2.8.2. Transcription errors

Transcribing errors are defined as any deviation in the transcription of a medication order. These Include any discrepancy in the drug name, drug formulation, route, dose, omission of the drug, and drugs that were not ordered . one type of medication error that healthcare personnel frequently make is transcription errors (Fahimi *et al*., 2009).

The majority of errors happened during the transcription of orders into patients' charts(Hartel et al., 2011).

Transcribing errors were recorded at varying levels, ranging from 0.7% to 56%.(Barker *et al*.,2002)(Lisby *et al*., 2005)(Fahimi *et al*.,

2009)(Pastó-Cardona *et al*., 2009)(Patanwala *et al*., 2010) (Vazin & Delfani, 2012)

A review of the literature on pharmaceutical errors in Middle Eastern nations found that more than half (50%) of omission errors occurred during transcription. According to numerous studies, the most common type of transcription error was omission in the specific (52%). (Alsulami *et al*., 2013; Hartel *et al*., 2011)

2.8.3. Dispensing errors

Any unexpected departure from an understandable written prescription or medication order is referred to as a medication dispensing error (MDE),errors in both the substance and labeling are present. Any unintentional departure from regulatory or professional standards, or from policies impacting dispensing procedures, is also regarded as a dispensing error(Ibrahim *et al*., 2020).

Cohen classified dispensing errors into eight types (Sulaiman, Z. H., 2017) as shown in table 1

Table 2-1: Classification of dispensing errors

Type of dispensing error	**Definition**
Wrong-drug error	occurs when a prescription is filled with a drug that is not what is listed in writing on the prescription.
Wrong-strength Error	occurs when a prescription is filled with a dosage unit that contains medication in

	excess of what the doctor prescribed.
Wrong dosage form	occurs when the prescription is filled with a different medication from what was prescribed by the doctor.
Wrong quantity Error	occurs when a patient receives medication in excess of what was ordered without a proper cause.
Label errors	There are two categories for these errors. Wrong label-instruction errors are when the patient's instructions are given in a way that is different from what was prescribed. The second kind of label error is incorrect prescription label information. This is identified by comparing the prescription with the label's required information, which includes the pharmacy's name and address, the prescription's serial number, the date it was written, the prescriber's name, the patient's name, the drug's name, its strength, how much was given, its expiration date, and the name of the manufacturer or distributor.
Deteriorated drug Error	occurs when a drug is stored improperly or after its expiration date, or both, according to the manufacturer's instructions.
Omission	Occurs when a patient fails to receive a prescribed medication.
Wrong time error	occur during ambulatory care visits that fill

	blister cards for long-term care or mental health facilities; during these visits, the drug may be placed in a spot on the card that differs from what is indicated on the prescription.

2.8.4. Administration Errors

The most frequent sorts of drug errors that can have serious repercussions for patients, medical personnel, and healthcare facilities are called medication administration errors (MAEs). The primary person in charge of providing medications is the nurse, who can devote up to 40% of their time to this task. The final safeguard for patients' wellness and the final safety check in the chain of events throughout the medicine administration process are nurses(Wondmieneh *et al*., 2020).

Drug administration is not just done by nurses. Medication administration is performed by medical professionals, qualified medication technologists, patients, and family members. The necessity for research that clearly distinguishes drug administrators is one of the challenges in determining the role of nursing in medication administration. Numerous studies have documented drug administration errors involving non-nurses.(Hicks et al., 2004) This is likely due to a variety of factors, including the fact that nurses may spend as much as 40% of their time administering medications(Armitage,G.,2003) .

The sorts of MAEs that are regularly committed include technical errors, lack of documentation, wrong patient, wrong medicine, wrong route, wrong dose, and improper time. Nurses should follow the six rights of

medicine administration and report medication administration errors in order to prevent medication errors before they reach the patient (MAEs), The appropriate patient, right drug, right time, right route, right dose, and right documentation are the six rights of medication delivery(Alemu et al., 2017).

Median error rate of 8.0% (interquartile range [IQR] 5.1%–10.9%) excluding wrong time errors (WTEs), while other reports a median error rate of 10.5% (IQR 7.3%–21.7%)(Jessurun *et al*., 2022).

2.8.5. monitoring error

This accounts for the untended failure in treatment process that leads to potentially cause harm to the patient(Feyissa *et al*., 2020).

When a prescription medication is not monitored in a manner that would be regarded acceptable in ordinary general practice, a monitoring mistake develops. It contains the absence of tests performed with a tolerance of 50%, at the frequency, It wouldn't be considered an error if a patient refused to provide permission for a test(Avery *et al*., 2013).

2.9. Causes of Medication Errors

Although mistakes are a natural component of human existence, every mistake a person makes in their daily life has a reason behind it. A temporary or permanent solution that will result in a decrease in these errors may be presented by identifying these reasons, errors may result from the normal behavioral processes that are and cognitive modifications brought on by acquired behavioral skills in the medical industry, following instructions is essential to the healing process and the treatment given to patients. In the sphere of medicine, carrying out directives is a crucial component of nursing

and guaranteeing the patients' safety, the nurses take the giving the recommended dosage and medication has the last say(Tingling, L.S.,2019).

In order to understand the causes of medication errors it is necessary to know the sub-dimensions that make up these factors, these include patients and the public, cultural differences, drugs, systems and drug applications, health professionals and poor lighting, lack of qualified personnel and inadequate number of staff, poorly designed medical devices and related errors, inability to read drug labels, errors in writing, reading or calculating the drug dose and lack of an effective independent dual control system for high-risk drugs(Bayer *et al*., 2022).

Primary causes of MAEs that could be attributed to the individual responsible for the error without using an established framework. These were broadly considered as either slips, lapses, mistakes or violations. Slips and lapses. were common, being identified by 29 studies (53.7 %). Misidentification of either medication or a patient were among the most frequently reported events considered as slips misreading either a medication label /product, prescription or other documentation was also common Staff confused look-a-like or sound-a-like medication names, patient names and medication packaging, which led to MEs(Keers et al., 2013).

Causes of medication errors in Iran have been reported to be inappropriate working hours, fatigue, being on night shifts, and two-night shifts without rest. In other words, long working hours and lack of energy or experience add to medication errors by nurses (Salar *et al*., 2020).

Nurses themselves believe that the main causes of medication error can be the use of abbreviations instead of the full names of drugs, similarity

in the names of drugs, carelessness of nurses, high work pressure and workload especially in emergency situations, low drug information and weakness in continuous education(Ghasemi *et al*., 2022).

2.10. Contributing factors to the occurrence of medication errors

The first step toward preventing the incidence of medication errors is a proper understanding of the contributing factors for the occurrence of these errors the causes of drug errors are thought to be numerous and complex there are two subgroups of contributing factors: those induced by systems and those caused by specific healthcare professionals(Savva *et al*., 2022).

Each hospital has a unique ordering, holding, and monitoring system for drugs. As a result, this method can significantly affect the likelihood that a medication error is made as well as whether it is discovered and reported. Work overload, staff shortages, and overall inadequacy in checks and procedures during any stage of the drug usage process are among the systemic concerns that are thought to contribute to medication errors(Westbrook et al., 2017).

1.10.1. Medication packaging factors

Medication mistakes can happen when drugs have names that are similar in appearance or pronunciation or when packaging elements are identical. These incorrect drug errors are referred to as LASA(look- alike, sound- alike) errors. Estimates for the percentage of LASA errors in total medication errors range from 6.23 to 14.7%, which poses a serious risk to patient safety. The erroneous medication may be administered as a result of these errors, which can happen during the prescription, distribution, or

administration of medications. Overdosing, under dosing, or incorrect dosage can all be caused by LASA mistakes. Similar appearance of medication or labeling causes confusions during drugs administration, Drugs naming, labeling and packaging are associated to the patients 'injuries and even deaths (Bryan *et al*., 2021).

2.10.2. Physicians factors

Use of Abbreviations: The frequent use of abbreviations contributes to medication errors. Suffixes like QD, OS, TID, QID, PR, etc. are frequently used to shorten the frequency of administration. QID is frequently confused with QD, which stands for once per day (four times a day). These acronyms can also be misused and taken to mean various different things. When writing prescriptions for medications, it is advised against using any abbreviations(Samaranayake *et al*., 2014).

For many years, both nurses and pharmacists have struggled with illegible writing. Because they typically write instructions down in haste and in illegible handwriting, doctors regularly make serious pharmaceutical errors. Shortcuts in the writing of drug orders are a lawsuit's best medicine. Frequently, the doctor or pharmacist cannot read the order and must make a best judgment(Cohen & Smetzer, 2017).

The poor communication between healthcare professionals especially the physicians and nurses have a great impact to be the factor for medication administration errors (Savva et al., 2022).

2.10.3. Nurses Factors

The most frequently reported MAEs factors from the perspective of nurses: lack of medical and pharmacology knowledge(Ayorinde,M.O., 2019).

Medication errors can occur at any step of medication process, from drug prescription to drug administration by the nurse or patient. Common causes of medication errors include prescription errors, dose miscalculations and poor calculation skills(kyalo-Ikol, 2018).

Non-adherence of the proper steps of medication preparation (checking-rechecking, application of the six rights which includes the right patient, right drug, right route, right time, right dose, right documintation), personal neglect, difficulties in using infusion devices, nurses' physical exhaustion(Karavasiliadou *et al*., 2014) (Miladinia *et al.*, 2016).

Informally exchanging information and discussing the absence of other doctors, nurses and doctors engaged in both structured and unstructured ward rounds. In order to organize medications for patient discharge and to exchange information on medication administration, nurses frequently spoke with pharmacists. Incomplete or poorly legible prescriptions can lead to pharmaceutical delivery problems, according to a second direct observational study(tessot,E., 2003).

2.10.4. Systems factors

The factors take first place to contribute to MAEs are inadequate number of nurses working and their heavy workloads the causes of errors at the highest rate. insufficient nursing staff and high nurse-to-patient ratio, the reasons for increasing MEs(Cetin, 2021)

Long workdays that go beyond what is necessary for effective performance might also be a result of high workloads and a shortage of nurses. The chance of a prescription error increased by three times once the nurse worked more than 12.5 hours providing direct patient care, according to a nationwide survey conducted by Rogers and colleagues the medication administration-related errors accounted for 58% of reported errors, 58% of actual errors, and 56% of near-misses among nurses who worked more than 12.5 hours (Rogers *et al*., 2004).

Another factor are poor relationships with the work environment, excessive pressure at work, interruptions in work, the interruptions during medication administration and a misunderstanding of what constitutes an error, combined with the urgent and critical nature of the provision of professional medical attention in this context(Escrivá Gracia et al., 2019).

2.10.5. Pharmacy factors

Medication dispensing is a fundamental function of community pharmacies, and errors that occur during the dispensing process are a major concern for the pharmacy profession, the work overload and pharmacists fatigue, have been highlighted as contributory factors, Poor handwriting and work overload might have contributed to pharmacists ignoring the quantity of the medication prescribed(Abdel-Qader et al., 2021).

2.9.6. Documentation-Transcription Factors

The medication error was the leading cause of death in hospitalized patients, therefore the study has revealed documentation errors has been including prescribing errors 37%, transcription errors 53% and

administration documentation errors 10%In the other study that has been conducted in Saudi Arabia has identified prescribing error 46.5% as the top cause of MAEs (Nkurunziza et al., 2020).

One short study looked at nurses' compliance with a hospital policy that required them to record the medications prescribed and how they affected the patients. One third of the progress notes from a sample of 12 nurses in one hospital were found to contain information about medications administered, but only 30% of those progress notes included medication name, dose, and time of administration, and only 10% recorded information about desired or unfavorable medication effects. There was no documentation of medication education, drug administration outcomes, or assessment prior to administration in any progress notes. Only half of the drugs that were refused were recorded.(Aitken, R.,2006)

2.11. Prevention of Medication Errors

2.11.1. Individual Prevention role

Nurses’ main role is administering medications to patients. Statistics show that they have more than 50 mediation orders in each shift that takes about one-third of their time (Dirik et al., 2019).

Administering medication to patients is one of the nurses’ main duties, however, they have not been successful in eliminating factors leading to medication errors. Medication errors happen during each part of the medication procedure like doctor’s orders, prescription, and dispensing medication, administering medication, and registering them (van de Vreede *et al*., 2019).

Reviewing patients' files shows that half of the medication errors in hospitals happen when there is disruption of responsibilities while taking care of the patients (Sheikh et al., 2019

Many researchers have mentioned that increasing nurses' medication knowledge can be an important strategy for reducing medication errors; moreover, they also indicated that updating nurses' knowledge especially about new medications can be an important factor for reducing such errors. (Rodziewicz & Hipskind, 2020).

Although the nurse's medication knowledge has been updated, the medication errors still happen. Results of a study showed that even IV training cannot prevent medication errors completely(Murugan et al., 2019).

Double- checking is widely rooted in nursing practice as an intervention against preparation and administration errors and associated harm. Hospital medication management procedures often require independent double checks for drug calculations and preparation of high-risk medications, pediatric medications and compounding intravenous medication(Mueller et al., 2019).

The utilization of double checks is resource-consuming, while the impact double checks have to prevent and reduce error rates and patient harm is limited (Westbrook *et al*., 2017).

2.11.2. The role of information technology

Information technology in healthcare play an important role in improving the safety, quality and efficiency (Zhang et al., 2020).

Computerized physician order entry CPOE allows physicians and other clinical care providers to write orders for hospitalized patients electronically, rather than via verbal or written communication. This allows clinical decision support to be given at the point of care and it can encourage clinicians to make better medication choices for patients, and also make them aware of potential safety issues related to the order (Holmgren et al., 2020).

The electronic medication administration technology was developed with the intention of reducing medication administration errors, saving nurses time and enhancing patient outcomes), In attempts to reduce some risks, electronic systems have been introduced to replace paper-based medication charts. Major issues with paper-based systems included poor legibility of prescriptions, delays with medication orders, prescribing errors by doctors, medication interactions, misplaced medication charts and the potential for multiple medication charts for the same patient in cases of complex illness (Gregory et al., 2022).

Smart infusion pumps are computerized infusion devices connected to the electronic medication administration record that check the programmed infusion rates against present limits within a drug library. Smart pumps reduce some types of errors but dose limits can be over-ridden, and intravenous medication administration errors still persist(Lyons et al., 2018).

Smart infusion pumps with dose error reduction software (DERS) and associated drug libraries are designed to provide users with decision support in order to identify programming errors before starting the infusion Drug specific dosing limits can be placed to prevent both overdosing (upper limits) and under dosing (lower limits). While soft limits are intended to

advise the user of potential errors and can be overridden, hard limits force functions to ensure that the facility-established medication-specific parameters are not exceeded (Kuitunen et al., 2022).

Barcode medication administration (BCMA) technology is a health information technology credited for preventing medication errors and promoting patient safety when used accurately BCMA technology automates the process of verification by scanning the barcode on the medication and the patient identification wristband, thus assisting the nurses in confirming the 'five rights' of medication administration: right patient, right medication, right dose, right route and right time, In an effort to prevent consequences of medication administration errors to patients, hospitals have strongly encouraged BCMA implementation The BCMA has shown to reduce medication administration errors significantly and to reduce harm from serious medication errors (Mulac et al., 2021).

Preventing errors is dependent on appropriate implementation of the technology within the hospital environment(van der Veen et al., 2018).

2.12. Previous Studies

2.12.1. First study

A study conducted by (Petrova E et al, 2010**),(Nurses 'perceptions of medication errors in Malta)** aim to identify Maltese nurses' perceptions of medication errors, including factors that may contribute to errors, barriers to reporting them and possible preventive measures. a survey was conducted of nurses (n=43) working on medical wards at a state general hospital in Malta. Data were collected by means of a self-administered questionnaire.

Thirty-eight nurses responded. Results The most frequently identified causative factors of medication errors were doctors' illegible handwriting, nurses' tiredness, and distraction or interruption while administering drugs. Participants said barriers to reporting errors were the administration system and fear of blame. Conclusion The introduction of hospital policies and the development of structured protocols on drug administration may decrease medication errors. The hospital administration system needs to stress the importance of reporting errors and adopt a non-punitive approach to safeguard patient safety. Other preventive strategies include increasing staff, avoiding distraction from patients and coworkers when medications are administered, and introducing regular education sessions in pharmacology and numeracy.

2.12.2. Second study

A study conducted by Eltaybani et al (2019)**(Nature of nursing errors and their contributing factors in intensive care units)** aimed to identify the nature of nursing errors and their contributing factors in intensive care units (ICUs). The study carried out A semi-structured interview with 112 critical care nurses to elicit the reports about their encountered errors followed by a content analysis. The result clearly record 300 mistakes in all were recorded. The majority of them (94%) were grouped into many error categories, such as "lack of intervention," "lack of attentiveness," and "documentation errors"—these were the error categories that were most commonly implicated. A whopping 40% of errors that were recorded led to major injury or patient deaths, and 84% of those errors had system-related causes. The evening shift had a higher mistake rate (42.7%) than the night and morning shifts (28.7% and 16.7%, respectively). When an error is

reported to a nurse supervisor and has an effect on the patient, there is a statistically significant relationship between the two (p 0001).

2.12.3. Third study

A study conducted by Dashti et al (2019) **(Medication Errors and its Reporting by Nurses of Intensive Care Units of Ardabil)** aimed to determine the rate of medication error and its reporting in nurses of the intensive care units in Ardabil. This descriptive cross-sectional study was performed on 208 nurses of intensive care units selected by census method in Ardabil city in 2017. Results: Data analysis showed that 86.4% of nurses had at least one medication error in the last 6 months. The mean of errors during this period was 3.6 cases per nurse, 2.68% of the errors led to physical injury and 19.46% of them was reported by the nurses to unit heads. The mean of error report was 0.7 cases for each nurse. The most common types of medication errors were included giving medication early or delayed (41.1%), not giving the prescribed medication (37.7%) or giving several oral medications together (30.9%). Conclusion: The results of the study indicate a high prevalence of medication error and, at the same time, a low level of error reporting. Therefore, it is recommended to hold rehearsal classes in relation to pharmacology and the principles of proper implementation of drug orders, to adopt management solutions to encourage nurses to report drug errors and to investigate the causes of the mismatch of the error report with the error rate and the factors influencing it.

2.12.4. Fourth study

A study conducted by Suclupe et al (2020**)(Medication errors in prescription and administration in critically ill patients)** aim: To

determine the prevalence and magnitude of medication errors and their association with patients' socio-demographic and clinical characteristics and nurses' work conditions. this study an observational, analytical, cross-sectional. were collected retrospectively from medical records and administration errors were identified through direct observation of nurses during drug administration. Results: A total of 650 prescription errors were identified for 961 drugs in 90 patients (mean error 7 [SD 4.1] per patient) and prevalence of 47.1% (95% CI 44-50). The most frequent error was omission of the prescribed medication. Intensive Care Unit stay was a risk factor associated with omission error (OR 2.14; 1.46-3.14: P <.01). A total of 294 administration errors were identified for 249 drugs in 52 patients (mean error 6 [SD 6.7] per patient) and prevalence of 73.5% (95% CI 68-79). The most frequent error was interruption during drug administration. Admission to the Intensive Care Unit (OR 0.37; 0.21-0.66: P <.01), nurses' morning shift (OR 2.15; 1.10-4.18: P=0.02) and workload perception (OR 3.64; 2.09-6.35: P <.01) were risk factors associated with interruption. Conclusions: Medication Errors in prescription and administration were frequent. Timely detection of Errors and promotion of a medication safety culture are necessary to reduce them and ensure the quality of care in critically ill patients.

2.12.5.fifth study

A study conducted by(Alzoubi et al., 2023)**(Medication Administration Error Perceptions Among Critical Care Nurses)** Purpose This study aimed to investigate the medication administration error perceptions among Jordanian critical care nurses. Methods: A cross-sectional, descriptive design was used among Jordanian critical care nurses. The total number of completed questionnaires submitted for

analysis was 340. Data were collected between July and August 2022 in two health sectors (governmental hospitals and educational hospital) in the middle and north region in Jordan through a self-administered questionnaire on medication administration errors which includes 65 items with three parts. Results: Nurses showed negative perceptions toward medication administration errors. The majority of participants agreed that "The packaging of many medications is similar" (76.7%), followed by "different medications look alike" (76.2%), as the main reasons for medication error occurrence. Two thirds of participants agreed that "when med errors occur, nursing administration focuses on the individual rather than looking at the systems as a potential cause of the error" (74.1%). Similarly, 73.5% of them believed nurses were blamed if something happens to the patient as a result of the medication error was the main reason for underreporting of MAEs. The highest reported levels of medication errors were in a range between 41% and 70%, for both types intravenous (IV) medication errors and non-intravenous (non-IV) medication errors. Conclusion: Implement interventions centered on MAEs in particular among critical care nurses, owing to the proven significance of it in foretelling their crucial role in delivering safe care to patients, which will lead to quantifiable returns on both patient outcomes and nurse health, as well as the overall efficiency and image of the organization.

Chapter Three

Methodology

Chapter Three

Methodology

In these pages we present all methods and principles which selected systematically to reach the specific objective of the current study.

3.1. Study Design

To assess and identify health quality situation in critical care units by understanding the medication errors and its contributing factors in Babylon Teaching Hospitals, a quantitative descriptive cross- sectional study was undertaken using an assessment methodology with questionnaire items for the periods of October 1th 2022 to Jun 15th 2023.

3.2. Administrative Arrangements

Before gathering the study data, the following official clearances were sought from appropriate authorities:

1. Approval of the Research Ethical Committee of the University of

Babylon's College of Nursing (appendix1).

2. In order to formally visit the Hospitals, approvals were also obtained

from the Babylon Health Directorate (appendix 2).

3. The permission is presented to hospitals, which includes.

A. Imam al Sadiq hospital.

B. Hilla Teaching Hospital.

C. Marjan Teaching Hospital

3.3. Setting of the Study

The research is being conducted at the Babel Teaching Hospitals. Imam Al-Sadiq hospital, Hila Teaching Hospital and Marjan teaching hospital are three of these hospitals.

3.3.1. Al-Imam AlSadiq teaching hospital

This hospital established to receive Babylonian citizen in 2017, the total capacity of this hospital is 503 beds. The critical care unit consists of RCU (20) beds, and CCU (15).

3.3.2. Al-Hilla surgical teaching Hospital

Al-Hilla surgical teaching hospital established in 1972 to provide its health services in Al-Hilla city since (47) years, the total capacity of the hospital is (447) bed, the Critical Care Unit consists of RCU (20) beds.

3.3.3. Al-Marjan Medical city:

This hospital established on (1957) and considered as the first general teaching hospital in Al-Hilla city, it specialized to receive the medical cases, the total capacity of the hospital is (316) beds. The critical care unit includes CCU (16) beds.

3.4. Study sample

Non-probability (purposive) sample of (150) nurses who work in the Critical care unit related to special criteria. The sample size calculated by following Richard Geiger formula

$$n = \frac{(\frac{z}{d})^2 \times p^2}{1 + \frac{1}{N}\left[(\frac{z}{d})^2 \times p^2 - 1\right]}$$

$$n=\frac{\frac{1.96}{0.05})^2\times 0.5^2}{1+\frac{1}{250}\left[(\frac{1.96}{0.05})^2\times 0.5^2-1\right]}$$

$=154\sim150$

Where

n=number of sample size, N=population size, d= confidence level (acceptable error level), p= coefficient of difference.

Table 3.1: Distribution of Study Sample Related to Teaching Hospitals.

Hospitals names	N	n	%
Al-Imam Al-Sadiq Teaching Hospital	115	69	46%
Marjan Medical City	40	24	16%
Al- Hilla Surgical Teaching Hospital	95	57	38%
Total	250	150	100%

3.4.1. Inclusion Criteria

All nurses who worked in critical care unit in the three hospitals.

3.4.2. Exclusion Criteria

- Nurses working in the administrative departments, outpatient clinics, and operating rooms were omitted from the study since they are unable to administer medication to patients in the critical care units.

- Nurses who have been employed by the aforementioned facilities for less than a six month; trainees are supervised and are not permitted to administer medication on their own.

- Nurses who selected for pilot study.

3.5. Study Instruments

To accomplish the objective of the study special questionnaire prepared after a comprehensive review of related literature in the field of interested phenomena the questionnaire divided into three parts

• **Part One**: included nurses' socio-demographic characteristics includes 8 items “age, sex, Marital status, Level of education, years of experience, Working hours, working shift, place of work”

• **Part Two**: Nurses were asked to categorize the frequency of the different forms of ME. Each ME was given a set of 10 items, and nurses were asked to categorize each ME according to how frequently it occurred, ranging from frequently to not at all.

Part Three: The topic of discussion was the factors of ME. A Likert scale was once more employed to categorize the nurses' perceptions of each element, from strongly agree to strongly disagree. it includes six domains to assess the contributing factors including the following:

1- Factors related to poor communication due to writing (5 items)
2- Factors related to the hospital (5 items)
3- Factors related to nurses (8 items)
4- Factors related to doctors (5 items)
5- Factors related to the pharmacy (8 items)
6- Factors related to the work environment (7 items)

3.6. Rating and Scoring

Three points Likert scale level used as a pattern of rating “always, sometimes and never” in order to determine the medication errors. The adopted scoring system which used is “always =3, sometimes =2 and for never=1”, four points Likert scale level used as a pattern of rating “strongly agree, agree, disagree, and strongly disagree” in order to determine the contributing factors. The adopted scoring system which used is: “strongly agree=4, agree=3, disagree=2, and strongly disagree=1”

3.7 Validity

Content validity obtained for the questionnaire which prepared to assess medication errors and contributing factors among critical care nurses through the expert panel to determine the Questionnaire visibility and competence in order to clarify these phenomena. A preliminary Arabic and English version of the questionnaire distributed among (10) experts (appendix 5), who have not less than (10) years of experience in their field. After reviewing the expert’s opinions and suggestions which focused on the translation. Changes performed to achieve proper language matching between Arabic and English version.

3.8. Pilot Study

This preliminary study was conducted to determine the study tool's stability and credibility, as well as its clarity and efficiency, as well as the typical amount of time needed to gather information about each character, which can be estimated during interview procedures, as well as to spot any potential problems throughout the identification process. The following points can be inserted to crystalize the benefits of the pilot study:

1. To determine the reliability of the study checklist.

2. To find out whether the contents of the checklist clear, understandable and easy in practice.

3. To estimate the average time which may needed for complete the individual checklist

3.2. Reliability of the Questionnaire

No. of items	Alpha Cronbach	Acceptable Value	Assessment
Medication Errors Item=10	0.90	0.70	Acceptable
Contributing Factors=38	0.81	0.70	Acceptable

Table (3.2) show the Data was acquired from (16) nurses who worked at a critical care unit. The reliability coefficient was utilized to determine the concordance between the items of the questionnaire utilizing reliability testing as a statistical analysis method. As evaluated by an Alpha Cronbach's, the scale exhibited an adequate level of internal consistency, the results of the final analysis of each set of questions using Alpha Cronbach's were as follows: the most common kind of medication errors was 0.90, and contributory factors had an alpha Cronbach's coefficient of 0.81, which is statistically acceptable.

3.10. Ethical Consideration

One of the most crucial factors in quantitative research—which frequently uses human subjects—is ethical consideration. Depending on the

nature of the study, verbal (or written) agreement is typically acceptable. This type of ethical grade may safeguard the subjects' privacy and dignity. agreement in writing regarding a particular agreement form that was collected from the study sample. (appendix 6)

3.11. Data collection

Data was collected using a questionnaire (Arabic version) and self-report methodologies with nurses after the appropriate approvals were completed. To obtain oral agreement the researcher gave each participant a brief introduction before outlining the study's objectives. The contributors (nurses) complete the form and supply a response. Following each participant's self-administered questionnaire, the information was gathered from them. It takes about fifteen to twenty minutes per self-report. Data collection started from 10 February to February 28, 2023, data were collected.

3.12. Data Analysis

To accomplish the specific objectives of this study the collected information tabulated and analyzed via descriptive and inferential statistical methods, which is available as (SPSS) program version 26.

3.12.1. Descriptive data analysis

The following parameters were determined using descriptive analysis, which is a method for describing demographic traits and responses to items:

- Frequency (F)
- Percentage = $Part/Whole \times 100$

3.12.2. Inferential data analysis

1- Mean of score (M.S) = sum of score /n

2-Standard Deviation (±SD) is calculated as following:

$$SD= \sqrt{\frac{\sum_{i=1}^{n} x_i^2 - n\bar{x}^2}{n-1}}$$

Where:

n = repetitions of the number

xi = Replicate i

x Replicate mean

3- Correlation Coefficient Formula $$r = \frac{n\sum x_i y_i - \sum x_i \sum y_i}{\sqrt{n\sum x_i^2 - (\sum x_i)^2}\sqrt{n\sum y_i^2 - (\sum y_i)^2}}$$

The following are shortcuts for measuring important in comparison to the level:

(1) **NS:** Non-significantly at probability-value>0.05.

(2) **S:** Significantly at probability-value<0.05.

(3) **HS:** Highly significantly at probability-value<0.01.

4- Independent t-test formula:

$$t_c = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

t_c: t calculated

$\boldsymbol{X_1}$: mean of first group $\boldsymbol{X_2}$: mean of second group

$\boldsymbol{S_1}$: standard deviation of first group $\boldsymbol{n_1}$: size first group

$\boldsymbol{S_2}$: standard deviation of second group $\boldsymbol{n_2}$: size of second group

5- Formula of one-way ANOVA table

d.f: degree of freedom **k:** number of groups **n:** number of samples

SSR: Sum of squares residual **SSE:** Sum of squares errors

MSR: Mean of squares residual **MSE:** Mean of squares errors

Source of Variance	Degree of Freedom (d.f.)	Sum of Square (S.S)	Mean of Square (M.S.)	F
Between Group	k-1	SSR	MSR=SSR/(k-1)	$F = \frac{MSR}{MSE}$
Within Group (Error)	k(n-1)	SSE	MSE=SSE/(k(n-1))	
Total	nk-1			

Chapter Four

Results of The Study

Chapter Four

Results of The Study

In order to facilitate scientific and logical interpretation in order to meet the study's objectives, the collected data are presented in this chapter as tables and graphic presentation following statistical management.

4-1. Descriptive Statistic of Nurses Demographic Variables

Demographic Variables	Rating	N=150	%
Age/years	20-29years old	132	88.0
	30-39years old	13	8.7
	40-49years old	3	2.0
	50 and older	2	1.3
	Total	150	100.0
	Mean ±SD= 1.17±0.511		
Sex	Male	69	46.0
	Female	81	54.0
	Total	150	100.0
Marital Status	Single	82	54.7
	Married	64	42.7
	Divorced	2	1.3
	Widowed	2	1.3
	Total	150	100.0
Qualification	Trained nurse	13	8.7
	Diploma in nursing	51	34.0

	Bachelor in nursing	86	57.3
	Total	150	100.0
Years of Experience	<5	115	76.7
	5-10	26	17.3
	>10	9	6.0
	Total	150	100.0
Working hours	Less than 8 hours	79	52.7
	More than 8 hours	71	47.3
	Total	150	100.0
Working Shift	morning shift	79	52.7
	Evening	71	47.3
	Total	150	100.0
Place of Work	RCU	107	71.3
	CCU	43	28.7
	Total	150	100,0

"N=number, %=Percentage, SD=standard deviation, M=mean"

The descriptive statistics of the nurses' sociodemographic data are shown in this table (4-1) as frequencies and percentages. Out of (150) Age groupings of the participants in this study, who made up (88.0%) percent of the total, ranged from 20 to 29 years. More than half of nurses were female, making them the majority in terms of gender it composes (54.0.%), and related to the study sample marital status, the higher percentage (54.7%) were single, while most of the study sample (57.3%) were Bachelor, and the experience years were the higher percentage of the study sample (76.7%) were with (less than 5 years), working hours the less than 8 hrs. were the large

percentage(52.7%) and the morning shift were the more (52.7%), A last point is that the vast majority of research participants were from RCU (71.3%).

4.2. Type of Occurrence Common Medication Errors Perceived by Nurses

NO.	Items	Always		Some times		never		Mean ±SD	Rank
		F	%	F	%	F	%		
1	Giving the dose at the wrong time (one hour before or after the scheduled time)	30	20.0	89	59.3	31	20.7	1.99±0.640	**1**
2	Omission in giving a dose	9	6.0	49	32.7	92	61.3	1.45±0.609	**5**
3	Giving the medicine intravenously at a faster/slower rate than prescribed (push or slow)	21	14.0	62	41.3	67	44.7	1.68±0.698	**2**
4	The dosage amount is less/more than prescribed by the doctor	7	4.7	43	28.7	100	66.7	1.38±0.575	**6**
5	Error in the number of doses	6	4.0	40	26.7	103	68.7	1.37±0.586	**7**
6	Giving medication at the wrong concentration (dissolving the medication in a way that is not prescribed)	17	11.3	66	44.0	67	44.7	1.67±0.672	**3**
7	Giving a medicine different from the one prescribed	7	4.7	19	12.7	124	82.7	1.22±0.516	**10**
8	Giving the medicine in the wrong way (in a place other than the specified one).	8	5.3	27	18.0	115	76.7	1.30±0.576	**8**
9	Giving medicine to the wrong patient	10	6.7	24	16.0	116	77.3	1.29±0.586	**9**
10	The doctor prescribed the wrong medication	14	9.3	64	42.7	72	48.0	1.63±0.661	**4**

"F: frequency, %: percentage, M: Mean for total score, SD=Standard Deviation for total score"

"cut of point=1, never occur (mean = <1), always occur (mean=≥ 1)"

This table presented that the result showed that the wrong time (one hour before or after the scheduled time) was the most common medication errors reported by the nurses with (20%) always and (59.3%) sometimes and mean (1.99) of the surveyed nurses agreed that this error frequently done. This was followed by medication rate faster/slower rate than prescribed (push or slow) with (14%) always and (41.3%) some times and with mean (1.68). and wrong concentration reported by nurses with (11.3%) always and (44.0%) sometimes with mean (1.67).

Table (4-2-1) Overall medication errors among critical care nurses.

Medication errors level	No.	%	M ±SD)	Ass.
Low	8	5.3%	2.10±0.445	**moderate**
Moderate	119	79.3%		
High	23	15.3%		
Total	150	100.0		

"M: Mean for total score, SD=Standard Deviation for total score"

"Low= (1-1.66), moderate=(1.67-2.33), high=(2.34-3)"

Table (4-2-1) showed (that (79.3%) of the nurses expressed a moderate level of medication errors occur (Mean=2.10; SD=0.445).

Table (4-3.1) Factors contributing to medication errors related to poor communication due to writing

No.	Items	Strongly Agree		Agree		Disagree		Strongly Disagree		Mean±S.D
		F	%	F	%	F	%	F	%	

1	Inability to read instructions due to doctor's poor handwriting	31	20.7	77	51.3	36	24.0	6	4.0	2.89±0.773
2	Not interpreting the doctor's instructions correctly.	16	10.7	64	42.7	62	40.7	8	5.3	2.59±0.753
3	Not understanding abbreviations.	11	7.3	65	43.3	63	42.0	11	7.3	2.51±0.740
4	The similarity of the names of the patients.	5	3.3	30	20.0	82	54.7	33	22.0	2.05±0.745
5	Wrong writing the patient's name or number on the medicine	11	7.3	53	35.3	63	42.0	23	15.3	2.35±0.827

"F, frequency- %, percentage- S.d= Standard deviation" "M.s.= Mean of score, Cut off point (0.74), non=(1=1.74), mild=(1.75-2.49), moderate=(2.50-3.24), sever=(3.25-4).

The results appear in the Table (4-3-1)the most frequent contributing factors to medication errors related to poor communication due to writing, that the first paragraph obtained the sample response (agree) with mean(2.89),the Not interpreting the doctor's instructions correctly with mean (2.59) and the Not understanding abbreviations obtain response agree with mean (2.51).

Table(4-3-2) factors contributing to medication errors related to the hospital

No.	**Items**	**Strongly Agree**		**Agree**		**Disagree**		**Strongly Disagree**		**Mean±S.D**
		F	**%**	**F**	**%**	**F**	**%**	**F**	**%**	

1	Insufficient staff compared to the number of patient	44	29.3	55	36.7	36	24.0	15	10.0	2.85±0.958
2	patient severity levels.	32	21.3	76	50.7	33	22.0	9	6.0	2.87±0.813
3	Workload	35	23.3	73	48.7	36	24.0	6	4.0	2.91±0.794
4	Inadequate training about medication administration.	15	10.0	62	41.3	52	34.7	21	14.0	2.47±0.857
5	No facilities for preparing medicines	21	14.0	46	30.7	58	38.7	25	16.7	2.42±0.929

"F, frequency- %, percentage- S.d= Standard deviation" "M.s.= Mean of score, Cut off point (0.74), non=(1=1.74), mild=(1.75-2.49), moderate=(2.50-3.24), sever=(3.25-4).

In this table(4-3-2) show result that the most frequent factors related to the hospital the first paragraph obtained sample response (agree) with mean (2.85), second paragraph response agree with mean (2.87) also the workload with mean (2.91), Consent means that these factors lead to medication errors.

Table(4-3-3) factors contributing to medication errors related to nurses

No.	Items	Strongly Agree		Agree		disagree		Strongly Disagree		Mean±S.D
		F	%	F	%	F	%	F	%	
1	Lack of knowledge of medicines.	15	10.0	67	44.7	46	30.7	22	14.7	2.50±0.865
2	Not understanding how errors happen	10	6.7	65	43.3	61	40.7	14	9.3	2.47±0.757
3	Non-compliance with policy	6	4.0	55	36.7	64	42.7	25	16.7	2.28±0.787

	documents and procedures									
4	Lack of skills to administer medicine	12	8.0	47	31.3	61	40.7	30	20.0	2.27±0.874
5	Lack of documentation before and after medication administration	12	8.0	34	22.7	67	44.7	37	24.7	2.14±0.883
6	Tired	29	19.3	69	46.0	38	25.3	14	9.3	2.75±0.874
7	Lack of sleep	25	16.7	62	41.3	50	33.3	13	8.7	2.66±0.858
8	personal negligence	18	12.0	33	22.0	58	38.7	41	27.3	2.19±0.972

"F, frequency- %, percentage- S.d= Standard deviation" "M.s.= Mean of score, Cut off point (0.74), non=(1=1.74), mild=(1.75-2.49), moderate=(2.50-3.24), sever=(3.25-4).

This table(4-3-3) presents the mean analysis for the factors related to nurses; Lack of knowledge of medicines, tired and lack of sleep with mean (2.50, 2.75, 2.66), were the most common reported factors as perceived by nurse.

Table(4-3-4) Factors contributing to medication errors related to doctors

No.	**Items**	**Strongly Agree**		**Agree**		**disagree**		**Strongly Disagree**		**Mean±S.D**
		F	**%**	**F**	**%**	**F**	**%**	**F**	**%**	
1	Medication orders for doctors are unread	22	14.7	52	34.7	55	34.7	21	14.0	2.50±0.910

2	Doctors change medications frequently	21	14.0	78	52.0	45	30.0	6	4.0	2.76±0.739
3	Abbreviations are used rather than writing the entire drug	20	13.3	66	44.0	52	34.7	12	8.0	2.63±0.816
4	The names of the medicines are used orally rather than written	10	6.7	47	31.3	59	39.3	34	22.7	2.22±0.874
5	Poor communication between doctors and Nurses	33	22.0	49	32.7	48	32.0	20	13.3	2.63±0.972

"F, frequency- %, percentage- S.d= Standard deviation" "M.s.= Mean of score, Cut off point (0.74), non=(1=1.74), mild=(1.75-2.49), moderate=(2.50-3.24), sever=(3.25-4).

This table(4-3-4) provides the mean analysis for the following aspects related to doctors: Medication orders for doctors are unread ,Physicians regularly change their patients' medications, abbreviations are used in place of spelling out the whole drug name, the most often reported issues as perceived by nurses were poor communication between doctors and nurses, with mean scores of (2.50, 2.76, 2.63, and 2.63).

Table(4-3-5) factors contributing to medication errors related to the pharmacy

No.	Items	Strongly agree		Agree		disagree		Strongly Disagree		Mean±S.D
		F	%	F	%	F	%	F	%	
1	The names of many drugs are the same.	24	16.0	72	48.0	42	28.0	12	8.0	2.72±0.828

2	Different medicines look the same.	15	10.0	60	40.0	63	42.0	12	8.0	2.52±0.783
3	The packaging of many medicines is the same.	16	10.7	64	42.7	50	33.3	20	13.3	2.51±0.857
4	Medicines are written in a different language.	20	13.3	57	38.0	51	34.0	22	14.7	2.50±0.903
5	The pharmacy provides incorrect unit doses.	9	6.0	40	26.7	77	51.3	24	16.0	2.23±0.787
6	The pharmacy does not prepare the medicine properly.	14	9.3	45	30.0	68	45.3	23	15.3	2.33±0.849
7	The pharmacy does not properly label and document medications.	12	8.0	37	24.7	81	54.0	20	13.3	2.27±0.793
8	Poor communication between pharmacists and nurses.	27	18.0	47	31.3	62	41.3	14	9.3	2.58±0.892

"F, frequency- %, percentage- S.d= Standard deviation" "M.s.= Mean of score, Cut off point (0.74), non=(1=1.74), mild=(1.75-2.49), moderate=(2.50-3.24), sever=(3.25-4).

This table(4-3-5) displays the mean analysis for pharmacy-related variables. Several medications have similar names, Medicines all have the same appearance, several medications use the same packaging, Medicines are written in a different language. Poor communication between pharmacists and nurses. average (2.72,2.52, 2.51, 2.50 and 2.58), were the most frequently mentioned factors in the nurse's opinion.

Table(4-3-6) factors contributing to medication errors related to the work environment

No.	Items	Strongly agree		Agree		Disagree		Strongly Disagree		Mean±S.D
		F	%	F	%	F	%	F	%	
1	Interruption and distraction while working by another person.	34	22.7	63	42.0	42	28.0	11	7.3	2.80±0.875
2	Poor communication between both nurses	18	12.0	45	30.0	55	36.7	32	21.3	2.33±0.945
3	insufficient nursing staff	32	21.3	58	38.7	46	30.7	14	9.3	2.72±0.906
4	Working with a nurse who does not have enough experience.	17	11.3	59	39.3	50	33.3	24	16.0	2.46±0.895
5	The lack of instructions on how to administer the drug inside the workplace	18	12.0	50	33.3	65	43.3	17	11.3	2.46±0.848
6	The lighting is insufficient.	22	14.7	33	22.0	73	48.7	22	14.7	2.37±0.908
7	The presence of noise in the workplace	45	30.0	49	32.7	39	26.0	17	11.3	2.81±0.992

"F, frequency- %, percentage- S.d= Standard deviation" "M.s.= Mean of score, Cut off point (0.74), non=(1=1.74), mild=(1.75-2.49), moderate=(2.50-3.24), sever=(3.25-4).

The most frequent issues from the perspective of nurses are shown in this table(4-3-6) together with factors related to the workplace environment; Interruption and distraction while working by another person with (2.80),

insufficient nursing staff with mean (2.72) ,Inadequate training in administering medication with mean (2.53) , and The presence of noise in the workplace with mean (2.81).

Table 4-4. Correlation between medication errors and contributing factors.

No.	Parameters	R(Pearson Correlation)	P-value (0.05)
1	Medication errors Factors related to poor communication due to writing	0.395**	0.000 H.S
2	Medication errors factors related to the hospital	0.168*	0.040 S
3	Medication errors factors related to nurses	0.407**	0 .000 H.S
4	Medication errors Factors related to doctors	0.283**	0.000 H.S
5	Medication errors Factors related to the pharmacy	0.231**	0.004 H.S
6	Medication errors Factors related to the work environment	0.270**	0.001 H.S

"Correlation is significant at the 0.01 level (2-tailed)"**

"*Correlation is significant at the 0.05 level (2-tailed)"

Table (4-4) shows that there is positive correlation between medication errors and contributing factors, because the p-value is less than (0.05), and (0.01) which indicates the existence of a positive significant between them

Table 4-5-1. Relationships between medication errors with regards nurse's age.

Age groups	N	Mean	S.D	F	P-value

20-29	132	1.5008	0.41045	0.549	0.650 NS
30-39	13	1.5000	0.37193		
40-49	3	1.2000	0.26458		
>50	2	1.4500	0.21213		
Total	150	1.4940	0.40288		

The results in table (4-5-1) demonstrated that nurses' age groups had no significant relationship with medication errors (p-value >0.05).

Table 4-5-2. Relationships between medication errors with regards nurse's gender.

Gender	**N**	**Mean**	**S.D**	**t**	**P-value**
Male	69	1.6203	0.45876	3.583	0.000 S
Female	81	1.3864	0.31295		

The findings showed in table(4-5-2) that there was significant link between the gender groups of nurses and medication errors (p-value <0.05).

Table 4-5-3. Relationships between medication errors with regards nurse's marital status characteristics.

Marital Status	**N**	**Mean**	**S.D**	**F**	**P-value**
Single	82	1.4915	0.42635	0.092	0.964
Married	64	1.5016	0.38606		

Divorced	2	1.3500	0.07071		NS
Widowed	2	1.5000	0.14142		
Total	150	1.4940	0.40288		

Table (4-5-3)The findings showed that there was no association between nurses' marital status groups and medication errors (p-value >0.05).

Table 4-5-4. Relationships between medication errors with regards nurse's educational level characteristics.

Educational Level	**N**	**Mean**	**S.D**	**F**	**P-value**
Secondary	13	1.3154	.21153	1.497	0.227
Diploma in nursing	51	1.4922	.43120		NS
Bachelor in nursing	86	1.5221	.40392		
Total	150	1.4940	.40288		

According to the findings in Table (4-5-4) (p-value >0.05), there was no correlation between the nurse's educational level of and medication errors.

Table 4-5-5. Relationships between medication errors with regards nurse's years of experience characteristics.

Experience Years	**N**	**Mean**	**S.D**	**F**	**P-value**
<5	115	1.4852	0.40528	0.677	0.509
5-10	26	1.5654	0.36654		NS
>10	9	1.4000	0.48477		
Total	150	1.4940	0.40288		

Table (4-5-5)The findings showed that there was no association between nurses' years of experience and medication errors (p-value >0.05).

Table 4-5-6. Relationships between medication errors with regards nurse's working hours characteristics.

Working Hours	N	Mean	SD	t	P-value
<8 hours	79	1.4241	0.35885	-2.251	0.026 S
>8 hours	71	1.5718	0.43628		

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Table (4-5-6)the findings showed a relationship between medication mistakes and their working hours (p-value< 0.05).

Table 4-5-7. Relationships between medication errors with regards nurse's working shift characteristics.

Working Shift	N	Mean	S.D	t	P-value
Morning Shift	79	1.4241	0.35885	-2.251	0.026 S
Evening	71	1.5718	0.43628		

Table (4-5-7)The results indicated a connection between medication errors and working shift (p-value< 0.05).

Table 4-5-8. Relationships between medication errors with regards nurse's place of work characteristics.

Place of Work	N	Mean	S.D	t	P-value
RCU	107	1.5262	0.41467	1.550	0.123 NS
CCU	43	1.4140	0.36422		

Table (4-5-8)The findings showed that the work unit of nurses had no bearing on medication errors (p-value >0.05).

Chapter Five

Discussion of

The Study Results

Chapter Five

Discussion

Unsafe drug practices are the leading causes of avoidable harm to patients in health care systems around the world. Most of them occur while taking the drug. Nurses play an important role in the occurrence as well as the prevention of medication administration errors.

These papers will give an abstract explanation over logical lattices and reasonably driven reasoning for statistical findings which were supported by the existing literatures, and the researcher's judgment. Using the study's aims as a guide, the findings will be interpreted.

5.1. Demographic characteristic of the Study Sample

Table(4-1) show The study's age group consisted of respondents aged 20 to 29 years old, making up (88%) of the study's total participants. These results support those of (Ikol, 2018)who found that the majority of study samples were between the ages of 20 and 29, and that they were necessary in critical areas of hospitals.

From the investigator's point of view, this result might be due to needed in critical care units because of the nature of their employment. Also, because most nurses with extensive experience work in primary healthcare, younger nurses are allowed to continue delivering care in hospitals. This age group is also capable of giving and perfecting nursing interventions in an efficient and effective manner.

In terms of gender, female nurses dominated and made up more than half of all nurses, as compared to male nurses, who make up 54.0% of all nurses.

The data show that more than half of the study sample had Bachelor (57.3%) This result agree with present study conducted among nurses in hospitals in the west of Iran Their findings revealed that the majority of nurses have a Bachelor and make up(90.6 %) of the workforce (Fathi *et al*., 2017)

The results shows that most of the sample (54.0%) were single, Regarding to the experience years were the higher (76.7%) were with (less than 5 years) This finding in the same line with Kim *et al*., (2011) who found that more than half of nurses had less than five years of experience in the study ,The majority of the study participants working less than 8 hrs in morning shift (52.7%), and from RCU (71.3%).

From the researcher's point of view This conclusion is also due to the increase in the faculties and new policies for nurses who had bachelor's degrees in nursing working at ICU.

5.2. Type of common medication errors

In table (4-2) results show that the most frequent errors among nurses is wrong time, and this result is not consistent with the Feleke in Ethiopia (Feleke et al., 2015),where the nurses showed that the wrong time is third common type of ME, while it agrees with the study conducted by the United States of America (cecil deans, 2021.), where it showed that 70% of the time error was the most common.

From the researcher's point of view The reason for this may be heavy workload and undernourishment of nurses, which are reported contributing factors leading to medication errors. Nurses generally consider the wrong time to be a minor mistake with no serious consequences, although it may cause a serious error that can sometimes endanger the lives of patients, As opposed to

that, the frequency of its occurrence may lead nurses to regard it as normal practice and not report it (Berdot *et al*., 2012).

The improper rate (too fast or too slow) is the second most common error, and this is consistent with a study conducted by (Kopp *et al*., 2006).

The following types of MES, on the other hand, are less common: incorrect concentration as a result of a calculation error; the doctor prescribing the incorrect medication; missing the dose; administering the medication to the incorrect patient; and administering a different medication than what was previously prepared. This result does not correspond to what was stated in the study of Sharia (Al-Shara, 2011).

Finally, it is seen that giving a treatment contrary to what was prescribed is the less common error, and this result is contrary to what was reached by Aziz's study,.Aziz *et al*., (2018) where the wrong medicine was the fifth.

From the researcher's point of view this can be explained because the majority of nurses are college graduates, and their knowledge is considered good about drugs in accordance with their academic studies.

5.3. factors contributing to medication errors

The Table (4.3.1) results indicate that most of the contributing factors to medication errors related to poor communication due to writing and the most frequent are Inability to read instructions due to doctor's poor handwriting ,Not interpreting the doctor's instructions correctly, these results agree with study conducted by Ghasemi *et al*., (2022) ,while the third factor is Not understanding abbreviations. This results are similar with the Turkish study(Güneş *et al*., 2014)and agree with Ayorinde(2019) study demonstrates

that 42.3% and 39.3% of respondents, respectively, would blame administration problems on abbreviations and trouble reading handwritten directives.

From the researcher's point of view, bad handwriting among doctors has serious repercussions that go far beyond just the difficulty of understanding it, the bad handwriting of the diagnosing doctor makes it difficult for the pharmacist to read it, and to provide the correct medication to the patient, so it causes medication errors to occur.

In table(4-3-2) the result shows the most frequent factors related to the hospital ,the first factor lead to MEs is Workload, this result similar result to Iranian study Gorgich *et al*., (2015), the other factor are patient severity levels, Insufficient staff this result agrees with frith study, which shows that the lack of nurses are among the most important factors that lead to medication errors (Karen H.Frith, 2012).

From the researcher's point of view, The reason is due to the increase in the number of patients and the small number of nurses working in critical care units, which leads to a doubling of work, which leads to the occurrence of medication errors.

The table(4-3-3) show result factor related to nurses the Lack of knowledge of medicines this result similar to this study (Tang *et al*., 2007).

Lack of sleep and being fatigued were the next two primary factors that contributed to the drug error that produced the same outcome as with turkey (Unver *et al*., 2012).

From the researcher's point of view, the tired and lack of sleep lead to stress and affect their functionality and could lead to MEs Al-Ahmadi *et al*.,

(2020) and from socio-demographical data show 47% from nurses work shift night and work more than 8 hrs.

The Table(4-3-4) factors related to doctors are Doctors change medications the most frequently it's the same result of this study (Tsegaye *et al*., 2020), Medication orders for doctors are unread similar this study Gorgich *et al*., (2015) that show the unread order third factor , poor communication between doctors and nurses was (32.7 percentage) it's similar to study carried out by Kim *et al*., (2011) and The least important aspect, as cited by 44% of the nurses, was their inability to understand the acronyms.

From the researcher's point of view, The nurse may administer an extra dose, administer the medication through a different route of administration, or even administer the medication at a different concentration if the abbreviation is misunderstood, which could result in a highly dangerous adverse drug event (ADE).

Table4-3-5 factors contributing to medication mistakes related to the pharmacy, medications have similar names is the first factor, Medicines all have the same appearance was the second ,and other following factor were Several medications use the same packaging, Medicines are written in a different language, poor communication between pharmacists and nurses, while the Aziz study (Aziz *et al*., 2018)show the similar name was the fifth, same appearance was third, and other following factor were The packaging of many medications was the second, Medications are written under different language was the fourth, and the first factor according this result was poor communication among pharmacists and nurses.

Factors related to the work environment in Table (4-3-6) are, the first most frequent is Interruption, the second factor was insufficient nursing staff,

and others factor were Inadequate training, presence of noise in the workplace These results were this study goes parallel with a study conducted by (Karavasiliadou *et al*., 2014).

From the researcher's point of view, interruptions can be a disturbing factor, affecting the nurses concentration and delaying care delivery, impeding the nurse from successfully finishing tasks, potentially favoring the occurrence of errors and putting patients at risk, and nursing shortages lead to errors, higher morbidity, and mortality rates in hospitals with high patient-to-nurse ratios, nurses experience burnout, dissatisfaction, and the patients experienced higher mortality and failure-to-rescue rates than facilities with lower patient-to-nurse ratios.

5-4. Association Between Types of Medication Error and its Contributing Factors

Table (4.4.) represent that there is relationship between medication mistakes and its contributing factors these results agreed with a research conducted by (Tsegaye *et al*., 2020) who found a number of factors that were significantly associated with medication errors, including ignorance, poor communication with other nurses when faced with a problem, interruptions during the administration of medications, and lack of guidelines. An institution-based, cross-sectional study carried out at two public hospitals in Southern Ethiopia found that there is a lack of training and other factors that are related to drug errors (Alemu *et al*., 2017).

5-5. relationship between medication error with regards nurse's socio-demographic characteristics

Findings indicate that educational level of nurses were no significant relationship with medication errors this result agreed with(Mahmood *et al*., 2011) Also, the results of the most recent study revealed a statistically significant relationship between MEs and gender. However, this information supports a finding made by Dornan *et al*., 2009) who discovered a significant difference between the frequency of medication errors by gender, with more females than males experiencing medication errors, Additionally, there was a correlation between nurses' working hours and shifts, with results that were similar to those of a study done by Feleke *et al*., (2015), the result show that no correlation between experience years of participant and medication errors occurrence this result disagree with Sears *et al*., (2016) that mentioned on Nurses with years of experience would be has the ability to detect errors during medication management. The reason for the study's inconsistency in years of experience is that most of the sample has more than five years of experience, while the results of my study for years of experience are less than five years.

From the researcher's point of view, this outcome was caused by the lack of a hospital-based continuous training program for nurses that is based on an educational plan for the fundamental courses and other courses according to work field requirements. Additionally, as the nurses said, the hospital only offered classes in CPR and infection control.

Chapter Six

Conclusions

and

Recommendations

Chapter Six

Conclusions and Recommendations

The result of this study may be concluded as the following:

1. According to the nurses' perception of medication errors, the most prevalent form is inappropriate time of medicine administration, which is consistent with other studies. Less frequently occurring types of MES include wrong rate (too fast or too slow), and wrong concentration.
2. Inability to reading due to handwriting, Not interpreting the instructions correctly, Abbreviations majority frequent Regarding to Factors contributing related to poor communication due to writing.
3. The most frequent factor related hospital were Workload patient severity levels, Insufficient staff, and the factors related to nurses; tired, lack of sleep and Lack of knowledge were more frequent.
4. Regarding to factors related to doctors the most frequent were change medications, Abbreviations, poor communication, and Medication orders unread.
5. Factors related to the pharmacy were most frequent; The names of medication are the same, Poor communication between pharmacists and nurses, medicines look the same, packaging, and different language. Factors related to the work environment were most frequent; presence of noise, Interruption, insufficient nursing staff, and Inadequate training.
6. For answering the second study question statistical analysis find There are significant relationships found between the medication errors and contributing factors.

7. The answer for the third question of the study, according to the presented finding there are significant differences between socio-demographical data (gender, working hours, and working shift).

Recommendations:

The present study could recommend, based on the above stated conclusion, that:

1. Raising the medical staff' awareness of medication errors: This is achieved through conducting professional training programs and seminars aimed at ensuring a safe health care system free of "medication errors". Such programs should address the sequential steps in the medication use process; standards for medication administration times; standards for working shifts, and the importance of having reasonable workload on the nurses.

2. After an education session, reassessment and follow-up for primary health care providers are required to monitor, evaluate, and promote their knowledge in order to ensure their application on the job.

3- The most convenient manner should be specified for reporting ME.

4. Policymakers and hospital administrators must consider the factors that contribute to ME when developing policies and strategies to combat those issues and create a safer healthcare system.

5- Health directorate needs to be providing equipment and facilities in critical care units to implementation of professional practice.

6- Health directorate decision makers need to be a distribution of nurses in appropriate numbers in intensive care units with expertise away from new appointments.

7- The decision makers should support the strength point in primary health knowledge and practice to meet the patient's needs.

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Appendices

Appendix (1)

(Approval)

University of Babylon
College of Nursing
Research Ethics Committee

جـــامـعة بـــابـــل
كـــلية التمريـــض
لجنة اخلاقيات البحث العلمي

Issue No:

Date: / 1 /2023

Approval Letter

To, اسماء جبار صاحب

The Research Ethics committee at the **University of Babylon, College of Nursing** has reviewed and discussed your application to conduct the research study entitled **" Medication errors and its contributing factors among critical care nurses".**

The Following documents have been reviewed and approved:

1. Research protocol
2. Research instrument/s
3. Participant informed consent

Committee Decision.

The committee approves the study to be conducted in the presented form. The Research Ethics committee expects to be informed about any changes occurring during the study, any revision in the protocol and participant informed consent.

Prof. Dr. Shatha Saadi Mohammed
Chair Committee
College of Nursing
Research Ethical Committee
31 / 1 /2023

Appendix (2A)

جمهورية العراق

Ministry Of Health Babylon Health Directorate Email:- Babel_Healthmoh@yahoo.com لأجل عراق اخضر مستدام ..سنعمل معا لترشيد استهلاك الطاقة الكهربائية والمحافظة على البيئة من التلوث		وزارة الصحة دائرة صحة محافظة بابـــل المديـــر العـــام مركـــز التدريب والتنمية البشرية وحدة أدارة البحوث العدد : ٢٧١ التاريخ: ٦ / ٢ /٢٠٢٣

إلى / مستشفى الأمام الصادق (ع)
مستشفى الحلة التعليمي
مستشفى مرجان التعليمي

م// تسهيل مهمة

تحية طيبة ...
أشـارة إلـى كتـاب جامعـة بابـل/ كليـة التمـريض / الدراسـات العليـا ذي العـدد ٥٠٩ في ٢٠٢٣/٢/٦
نرفـق لكـم ربطـا اسـتمارات المـوافقة المبدئيـة لمشـروع البحـث العائـد للباحثـة طالبـة الدراسـات العليا/ ماجستير(أسماء جبار صاحب).

للتفضـل بـالاطلاع وتسـهيل مهمـة المومـا أليـه مـن خـلال توقيـع وختـم اسـتمارات أجـراء البحـث المرفقـة فـي مؤسسـاتكم وحسـب الضـوابط والإمكانـات لاستحصـال الموافقـة المبدئيـة ليتسـنى لنـا أجراء اللازم على أن لا تتحمل مؤسساتكم أية تبعات مادية وقانونية .... مع الاحترام

المرفقات:
استمارة عدد /٢

وزارة الصحة
دائرة صحة بابل
مركز التدريب والتنمية البشرية

الدكتور
عز محمد عبد الله عجرش
مدير مركز التدريب والتنمية البشرية
/ /٢٠٢٣

نسخة منه إلى :
- مركز التدريب والتنمية البشرية / وحدة أدارة البحوث مع الأوليات ...

Appendix (2B)

جمهورية العراق

وزارة الصحة
دائرة صحة محافظة بابـــل
المديـــر العـــام
مركـــز التدريب والتنمية البشرية
وحدة أدارة البحوث

العدد : ٧١٤
التاريخ: ٦/ ٤ /٢٠٢٣

Ministry Of Health
Babylon Health Directorate
Email:
Babel_Healthmoh@yahoo.com

لأجل عراق اخضر جميعنا .. سنعمل معا لترشيد استهلاك الطاقة الكهربائية والمحافظة على البيئة من التلوث

٥٧٤
٢٠٢٣/٤/٧

إلى/ مستشفى الأمام الصادق (ع)
مستشفى الحلة التعليمي
مستشفى مرجان التعليمي

م// تسهيل مهمة

تحية طيبة ...
أشارة إلى كتاب جامعة بابل/ كلية التمريض / الدراسات العليا ذي العدد ٥٠١ في ٢٠٢٣/٢/٦
نرفق لكم ربطا استمارات الموافقة المبدئية لمشروع البحث العائد للباحثة طالبة الدراسات العليا/ ماجستير(أسماء جبار صاحب).

للتفضل بالاطلاع وتسهيل مهمة الموما اليه من خلال توقيع وختم استمارات أجراء البحث المرفقة في مؤسستكم وحسب الضوابط والامكانات لاستحصال الموافقة المبدئية ليتسنى لنا أجراء اللازم على أن لا يترتب على ذلك أية تبعات مادية وقانونية .... مع الاحترام

المرفقات :
استمارة عدد /٢

دائرة صحة بابل
مركز التدريب والتنمية البشرية
الدكتور
م/ محمد عبد الله عجرش
مدير مركز التدريب والتنمية البشرية
٢٠٢٣/ /

نسخة منه إلى:
- مركز التدريب والتنمية البشرية / وحدة أدارة البحوث مع الأوليات

Appendix(2C)

جمهورية العراق

وزارة الصحة
دائرة صحة محافظة بابـــل
المديـــر العـــام
مركـــز التدريب والتنمية البشرية
وحدة أدارة البحوث

العدد : ٧٨١
التاريخ: ٦/ ٢/ ٢٠٢٣

Ministry Of Health
Babylon Health Directorate
Email:-
Babel_Healthmoh@yahoo.com

لأجل عراق اخضر مستدام ..سنعمل معا لترشيد استهلاك الطاقة الكهربائية والمحافظة على البيئة من التلوث

مستشفى مرجان للأمراض الباطنية والقلبية التخصصي (الجوارة)
العدد : ٧٥٢
التاريخ ١٢/ ٢/ ٢٠٢٣

إلى / مستشفى الأمام الصادق (ع)
مستشفى الحلة التعليمي
مستشفى مرجان التعليمي

م// تسهيل مهمة

تحية طيبة ...

أشـارة إلـى كتـاب جامعـة بابـل/ كليـة التمـريض / الدراسـات العليـا ذي العـدد ٥٠١ فـي ٢٠٢٣/٢/٦

نرفـق لكـم ربطـا اسـتمارات المـوافقة المبدنيـة لمشـروع البحـث العائـد للباحثـة طالبـة الدراسـات العليا/ ماجستير(أسماء جبار صاحب).

للتفضـل بـالاطلاع وتسـهيل مهمـة المومـا أليـه مـن خـلال توقيـع وخـتم اسـتمارات أجـراء البحـث المرفقـة فـي مؤسسـاتكم وحسـب الضـوابط والإمكانـات لاستحصـال الموافقـة المبدنيـة ليتسـنى لنـا أجراء اللازم على أن لا تتحمل مؤسساتكم أية تبعات مادية وقانونية .... مع الاحترام

المرفقات :
استمارة عدد /٢

مركز التدريب والتنمية البشرية

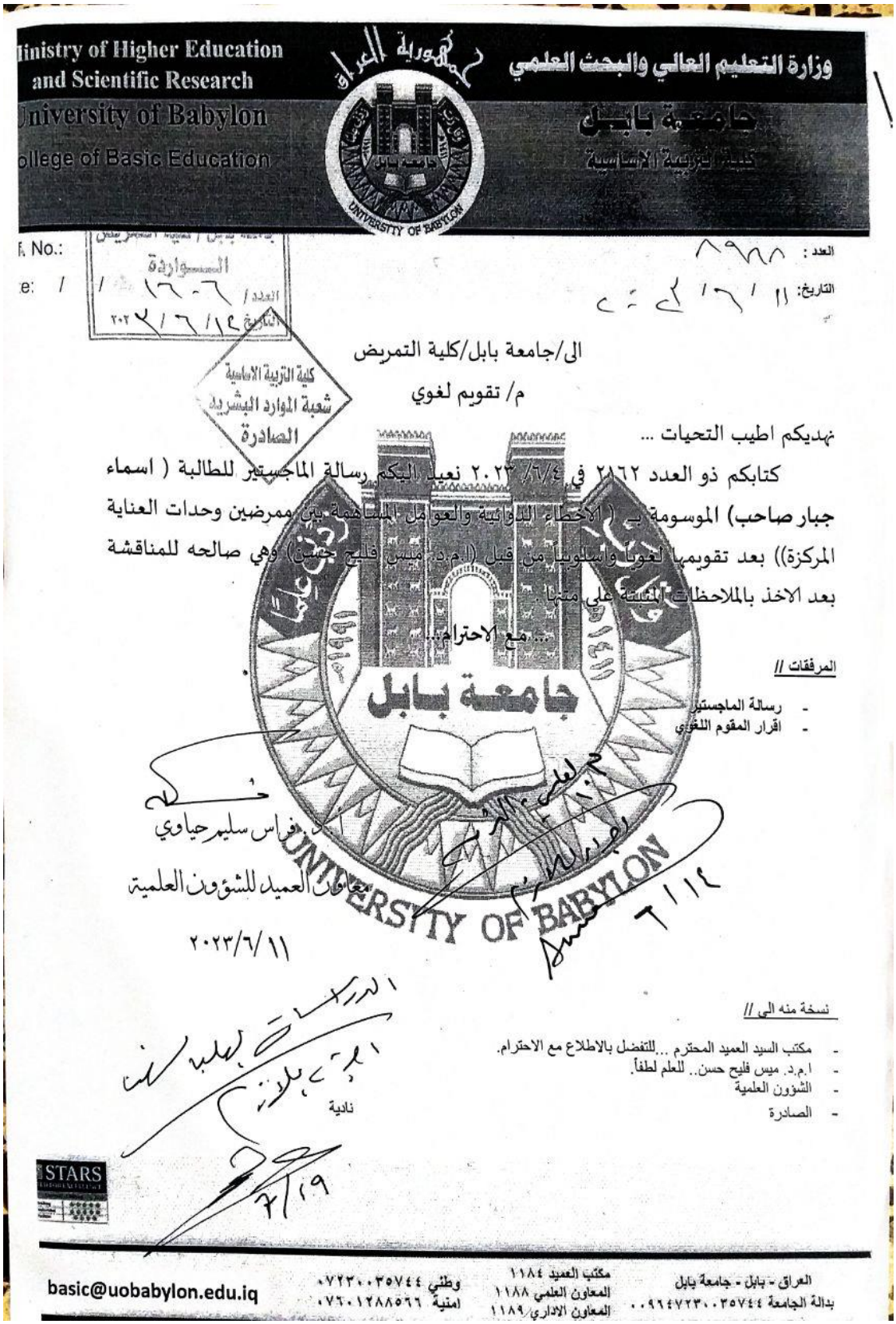
الدكتور
محمد عبد الله عجرش
مدير مركز التدريب والتنمية البشرية
/ /٢٠٢٣

مسؤولة التطوير التدريبي المستدام

نسخة منه إلى :
- مركز التدريب والتنمية البشرية / وحدة أدارة البحوث مع الأوليات ...

دائرة صحة محافظة بابل / مركز التدريب والتنمية البشرية // ايميل المركز babiltrainning@gmail.com

Appendix(3)



Ministry of Higher Education and Scientific Research
University of Babylon
College of Basic Education

وزارة التعليم العالي والبحث العلمي
جامعة بابل
كلية التربية الاساسية

جمهورية العراق

F. No.:
Date: /

العدد: ٢٨٦٢
التاريخ: ١١ / ٦ / ٢٠٢٣

الصادرة
العدد / ٢٨٦٢
التاريخ ١٤ / ٦ / ٢٠٢٣

كلية التربية الاساسية
شعبة الموارد البشرية
الصادرة

الى/جامعة بابل/كلية التمريض

م/ تقويم لغوي

نهديكم اطيب التحيات ...

كتابكم ذو العدد ٢٨٦٢ في ٢٠٢٣/٦/٤ نعيد اليكم رسالة الماجستير للطالبة (اسماء جبار صاحب) الموسومة بـ (الاخطاء الدوائية والعوامل المساهمة بين ممرضين وحدات العناية المركزة)) بعد تقويمها لغويا واسلوبيا من قبل (ا.م.د. ميس فليح حسن) وهي صالحه للمناقشة بعد الاخذ بالملاحظات المثبتة على متنها

....مع الاحترام...

المرفقات //

- رسالة الماجستير
- اقرار المقوم اللغوي

جامعة بابل

UNIVERSITY OF BABYLON

أ.د. فراس سليم حياوي
معاون العميد للشؤون العلمية

٢٠٢٣/٦/١١

نسخة منه الى //

- مكتب السيد العميد المحترم ...للتفضل بالاطلاع مع الاحترام.
- ا.م.د. ميس فليح حسن.. للعلم لطفاً.
- الشؤون العلمية
- الصادرة

نادية

STARS

basic@uobabylon.edu.iq
وطني ٠٧٢٣٠٠٣٥٧٤٤
امنية ٠٧٦٠١٢٨٨٥٦٦
مكتب العميد ١١٨٤
المعاون العلمي ١١٨٨
المعاون الاداري ١١٨٩
العراق - بابل - جامعة بابل
بدالة الجامعة ٠٠٩٦٤٧٢٣٠٠٣٥٧٤٤

Appendix (4A)

Nurse's Questionnaire

Part 1:- Study participants' sociodemographic characteristics

1- Gender:

Male ☐ Female ☐

2- Age ☐

3- Marital status

Single ☐ Married ☐

Divorced ☐ Widowed ☐

4-Qualification

Preparatory graduate nurse ☐ Diploma in nursing ☐

Bachelor in nursing ☐ Master in nursing ☐

5-Years of experience ☐

6- Working hours

< 8hours ☐ more than 8 hours ☐

7- Working shift

Morning ☐ Evening ☐

8- place of work

RCU ☐ CCU ☐

Part 2:- Types of medication errors.

Through your experience working in the hospital, classify the following medication errors according to the frequency of their occurrence in the hospital

*	**Types of medication administration errors**	**Always**	**Sometimes**	**Never**
1	Giving the dose at the wrong time (one hour before or after the scheduled time)			
2	Omission in giving a dose			
3	Giving the medicine intravenously at a faster/slower rate than prescribed by the doctor			
4	The dosage amount is less/more than prescribed by the doctor			
5	Error in the number of doses			
6	Giving medication at the wrong concentration (dissolving the medication in a way that is not prescribed)			
7	Giving a medicine different from the one prescribed			
8	Giving the medicine in the wrong way (in a place other than the specified one).			
9	Giving medicine to the wrong patient			
10	The doctor prescribed the wrong medication			

Part 3:_ Contributing factors to medication errors.

Do you think that any of the following factors lead to medication errors?

*	**Factors**	Strongly Agree	Agree	Disagree	Strongly Disagree
*	**First: Factors related to poor communication due to writing**				
1	Inability to read instructions due to doctor's poor				

	handwriting				
2	Not interpreting the doctor's instructions correctly.				
3	Not understanding abbreviations.				
4	The similarity of the names of the patients.				
5	Wrong writing the patient's name or number on the medicine				
*	**Second: factors related to the hospital**				
1	Insufficient staff compared to the number of patients				
2	patient status severity levels.				
3	Workload				
4	Inadequate training about medication administration.				
5	No facilities for preparing medicines				
*	**Third: factors related to nurses**				
1	Lack of knowledge of medicines.				
2	Not understanding how errors happen				
3	Non-compliance with policy documents and procedures				
4	Lack of skills to administer medicine				
5	Lack of documentation before and after medication administration				
6	Tired				

7	Lack of sleep				
8	personal negligence				
Fourth: Factors related to doctors					
1	Medication orders for doctors are unread				
2	Doctors change medications frequently				
3	Abbreviations are used rather than writing the entire drug				
4	The names of the medicines are used orally rather than written				
5	Poor communication between doctors and nurses				
*	**Fifth: Factors related to the pharmacy**				
1	The names of many drugs are the same.				
2	Different medicines look the same.				
3	The packaging of many medicines is the same.				
4	Medicines are written in a different language.				
5	The pharmacy provides incorrect unit doses.				
6	The pharmacy does not prepare the medicine properly.				
7	The pharmacy does not properly label and document medications.				
8	Poor communication between pharmacists and nurses.				
*	**Sixth: Factors related to the work environment**				
1	Interruption and distraction while working by another person.				
2	Poor communication between both nurses				

3	Insufficient nursing staff.				
4	Working with a nurse who does not have enough experience.				
5	The lack of instructions on how to administer the drug inside the workplace				
6	The lighting is insufficient.				
7	The presence of noise in the workplace				

Appendix (4B)

الاستبانة

<u>الجزء الاول: المعلومات الديموغرافية:</u>

العمر : ☐

الجنس: ذكر ☐ انثى ☐

الحالة الزوجية :

أعزب ☐ متزوج ☐

مطلق ☐ أرمل ☐

المؤهل التعليمي:

خريج إعدادية تمريض ☐ خريج دبلوم تمريض ☐

خريج بكالوريوس تمريض ☐ خريج ماجستير او دكتوراه تمريض ☐

عدد سنوات الخدمة: ☐ **سنه**

عدد ساعات العمل:

8> ساعات ☐ أكثر من 8 ساعات ☐

نوع العمل

صباحي ☐ مسائي ☐

مكان العمل

CCU ☐ RCU ☐

الجزء الثاني: انواع الأخطاء الدوائية

***من خلال خبرتك بالعمل في المستشفى، صنف الأخطاء الدوائية التالية حسب تكرار حدوثها بالمستشفى**

ت	الفقرات	دائما	أحيانا	لا تحدث
1	إعطاء الجرعة في الوقت غير المحدد لها (ساعة قبل او بعد الموعد المحدد)			
2	إغفال في إعطاء الجرعة			
3	أعطاء الدواء بالوريد بمعدل أسرع\ أبطأ مما وصف الطبيب) push or slow(			
4	كمية الجرعة اقل\ أكثر مما وصف الطبيب			
5	خطأ في عدد الجرعات			
6	إعطاء دواء بتركيز خاطئ (حل الدواء بطريقة تخالف الموصوف)			
7	إعطاء دواء مختلف عن الدواء الموصوف			
8	إعطاء الدواء بطريقة خاطئة (في مكان غير المكان المحدد).			
9	إعطاء الدواء للمريض الخطأ			
10	الطبيب وصف دواء خاطئ			

الجزء الثالث: العوامل المساهمة فى الأخطاء الدوائية

*هل تعتقد\ي أن أي من العوامل التالية تؤدي الى حدوث الأخطاء الدوائية

ت	الفقرات	موافق بشدة	موافق	غير موافق	غير موافق بشدة
ت	**اولا: العوامل المتعلقة بسوء التواصل بسبب الكتابة**				
1	عدم القدرة على قراءة التعليمات بسبب سوء خط الطبيب				
2	عدم تفسير تعليمات الطبيب بشكل صحيح.				
3	عدم فهم الاختصارات.				
4	التشابه بأسماء المرضى.				
5	خطأ او عدم كتابة اسم المريض على الدواء				
ت	**ثانيا: العوامل المتعلقة بالمستشفى**				
1	عدم كفاية الكوادر مقارنة بعدد المرضى				
2	مستويات خطورة حالة المريض.				
3	عبء العمل				
4	عدم كفاية التدريب حول اعطاء الدواء.				
5	عدم وجود مرافق للممرض لتحضير الأدوية				
ت	**ثالثا: العوامل المتعلقة بالممرضين**				
1	قلة المعرفة بالأدوية.				
2	عدم فهم كيفية حدوث الأخطاء				
3	عدم اتباع التعليمات وسياسة التوثيق				
4	عدم وجود المهارات اللازمة لإعطاء الدواء				
5	عدم وجود توثيق قبل وبعد اعطاء الدواء				
6	التعب والاجهاد بسبب كثرة العمل				
7	قلة النوم				
8	إهمال شخصي				

ت					
	رابعا: العوامل المتعلقة بالأطباء				
1	أوامر الأدوية للأطباء غير مقروءة				
2	الأطباء يغيرون الأدوية بشكل متكرر				
3	يتم استخدام الاختصارات بدلاً من كتابة الدواء بالكامل				
4	يتم استخدام أسماء الأدوية بشكل شفوي بدلا من الكتابة				
5	ضعف التواصل بين الأطباء والممرضين				
ت	**خامسا: العوامل المتعلقة بالصيدلية**				
1	أسماء العديد من الأدوية متشابهة.				
2	تبدو الأدوية المختلفة متشابهة.				
3	عبوات العديد من الأدوية متشابهة.				
4	الأدوية مكتوبة بلغة مختلفة.				
5	تقدم الصيدلية جرعات غير صحيحة للوحدة.				
6	الصيدلية لا تحضر الدواء بشكل صحيح.				
7	لا تقوم الصيدلية بتسمية الأدوية وتوثيقها بشكل صحيح.				
8	ضعف التواصل بين الصيادلة والممرضين.				
ت	**سادسا: العوامل المتعلقة ببيئة العمل**				
1	المقاطعة و التشتيت اثناء العمل من قبل شخص أخر.				
2	سوء التواصل بين الممرضين معا				
3	عدم وجود طاقم كافي من التمريض.				
4	العمل مع ممرض\ ممرضة لا يملك الخبرة الكافية.				
5	عدم وجود تعليمات حول طريقة إعطاء الدواء داخل مكان العمل				
6	الإضاءة غير كافية.				
7	وجود ضوضاء في مكان العمل				

Nurses questionnaire

((استمارة تحكيم))

حضرة الاستاذ/ ة الفاضل/ ة// .....

تحية طيبة:

نظرا لما تملكه من خلفية ومكانة علمية وخبرة عملية مرموقة في مجال اختصاصك يرجى التفضل بمراجعة ورقة الاستبانة المرفقة والخاصة برسالة الماجستير الموسومة

"أنواع الاخطاء الدوائية وعواملها المساهمة بين ممرضي العناية الحرجة "

"Types of Medication Error and its Contributing Factors among Critical Care Nurses"

وابداء ملاحظاتك القيمة عليها للأخذ بها مع فائق الشكر والتقدير

الاسم الكامل/.....

اللقب العلمي/.....

مكان العمل/.....

سنين الخبرة/.....

التوقيع/.....

الباحثة

طالبة الماجستير

أسماء جبار صاحب

جامعة بابل/كلية التمريض

قسم تمريض البالغين

Appendix (5)

قائمة اسماء الأساتذة الخبراء

اسم الخبير	اللقب العلمي	الاختصاص	مكان العمل	سنوات الخبرة
1- د سجاء جاسم محمد	استاذ	تمريض الصحة النفسية والعقلية	جامعة بابل -كلية التمريض	40
2- د أركان بهلول ناجي	استاذ	تمريض صحة الاسرة والمجتمع	جامعة بغداد- كلية التمريض	36
3- د نهاد محمد قاسم	استاذ	تمريض أطفال	جامعة بابل -كلية التمريض	35
4- د سحر ادهم	أستاذ	تمريض بالغين	جامعة بابل -كلية التمريض	34
5- د ناجي ياسر	استاذ	تمريض صحة الاسرة والمجتمع	جامعة بابل -كلية التمريض	33
6-د فاطمة وناس	استاذ	تمريض صحة الاسرة والمجتمع	جامعة الكوفة-كلية التمريض	30
7- د وسام جبار قاسم	استاذ	تمريض صحة الاسرة والمجتمع	جامعة بغداد- كلية التمريض	26
8-د سلمى كاظم	استاذ	تمريض صحة الاسرة والمجتمع	جامعة بابل -كلية التمريض	26
9-د شذى سعدي	استاذ	تمريض بالغين	جامعة بابل -كلية التمريض	24
10- د منصور عبد الله	أستاذ مساعد	تمريض صحة الاسرة والمجتمع	جامعة الكوفة-كلية التمريض	19

Appendix (6)

السيد / السيدة

:أنت مدعو للمشاركة بمشروع بحث علمي بعنوان

الأخطاء الدوائية وعواملها المساهمة بين ممرضين العناية المركزة

يرجى أن تأخذ الوقت المناسب لقراءة المعلومات الآتية بتأنٍ قبل أن تقرر إذا ما كنت راغباً بالمشاركة أم لا. وبإمكانك طلب مزيداً من الإيضاحات أو المعلومات الإضافية عن أي أمر مذكور بالاستمارة أو عن الدراسة من الباحث أو اي مختص أخر.

أولا: معلومات البحث	
اسم الباحث	
اسم المشرف	
أهداف البحث	
الفترة المتوقعة لمشاركة الشخص في البحث	
الاجراءات المتبعة في جمع العينات	
المخاطر المتوقعة كنتيجة للمشاركة في البحث	لا يوجد
الفوائد التي ستعود على الشخص مقابل الاشتراك في البحث	لا يوجد
ثانيا: معلومات للشخص المشارك بالبحث	
1. ان المشاركة في هذا البحث طوعية	
2. بإمكانك سَحب مشارَكتك من الدِراسة متى شئت ولأي سبب	
3. من حقك ان لا تجيب عن اي سؤال لا ترغب بإجابته	
4. ان مشاركتك بالبحث لن تحملك اي نفقات مالية	
5. ان مشاركتك بالبحث لا يترتب عليها اي مسائلة قد تضر بك شخصيا أو بعملك.	
6. ان اسمك سيكون سريا وإن المعلومات الناتجة عن مشاركتك سوف تعامل بسرية تامة ولن يطلّع عليها أي شخص ما عدا الباحث والمشرف ولجنه الاخلاقيات عند الضرورة.	
7. وأن المعلومات التي ادليت بها والنتائج العلمية لهذا البحث هي للأغراض العلمية فقط ولن تكون هناك أية إشارة إلى لك أو لعائلتك في أي منشور عن هذه الدراسة.	
8. ان من حقك بمعرفة النتائج العامة للبحث، او اي نتائج تتعلق بك بصورة خاصة.	
ثالثا: معلومات الاتصال	
في حال وجود اي استفسار او شكوى من قبلك حول مشروع البحث بإمكانك الاتصال بالباحث أو لجنة اخلاقيات البحث في جامعة بابل – كلية التمريض	
اسم الباحث: اسماء جبار صاحب رقم الهاتف: 07812258638 البريد الالكتروني: asma.sahib.nurh72@student.uobabylon.edu.iq:	
لجنة أخلاقيات الابحاث العلمية – جامعة بابل – كلية التمريض: رقم الهاتف: 00964772850116 البريد الالكتروني : ammar_shalan@yahoo.com.au	

اسم المشترك بالبحث:

مصادقة السيد الحميد المحترم توقيعه

في حال كون عمر الشخص المشارك اقل من18 سنة، او كونه غير قادر على فهم أو قراءة الاستمارة يرجى توقيع ولي أمره الشرعي.

اسم ولي أمر المشترك:

المستخلص

يمكن أن يكون للأخطاء الدوائية مجموعة متنوعة من الآثار المختلفة التي تؤدي إلى ارتفاع معدل وفيات المرضى واعتلالهم ، وإقامة أطول في المستشفى ، وارتفاع المطالب المالية.

لمعرفة العلاقة بين الأخطاء الدوائية والعوامل المساهمة ، وفحص الاختلافات في الخطأ الدوائي فيما يتعلق بالسمات الاجتماعية والديموغرافية للممرضين.

دراسة وصفية مقطعية أجريت في مدينة الحلة خلال الفترة من 1 تشرين الأول 2022 إلى 15 حزيران2023. تم اختيار عينة الدراسة المكونة من 150 ممرضا وممرضة يعملون في وحدات العناية المركزة وفقا لنهج أخذ العينات غير الاحتمالية. وتحقق الخبراء من صحة الاستبيان، وأكدت دراسة تجريبية موثوقية النتائج. تم جمع البيانات من خلال التقرير الذاتي.

أشارت النتائج إلى أن غالبية عينة الدراسة (88.0٪) تتراوح أعمارهم بين 20 - 29 عاما. أكثر من نصف الممرضين من الإناث (54.0٪) والحالة الاجتماعية، وكانت النسبة الأعلى (54.0٪) اعزب، و (57.3٪) بكالوريوس، وكانت سنوات الخبرة أقل من 5 سنوات هي الأعلى (76.7٪)، وساعات العمل أقل من 8 ساعات. كانت النسبة الكبيرة (52.7٪) والفترة الصباحية أكثر (52.7٪) ، ومكان العمل في RCU (71.3٪). يشير الارتباط إلى علاقة دلالة بين خطأ الدواء والعوامل المساهمة فيه (p = .000). أظهرت النتائج أن هناك فروقا ذات دلالة إحصائية بين البيانات الاجتماعية الديموغرافية (الجنس وساعات العمل ونوبة العمل).

وخلصت الدراسة إلى أن مستوى حدوث الأخطاء الدوائية بين ممرضي الرعاية الحرجة هو متوسط .ويجب توعية الكوادر الطبية حول الأخطاء الدوائية من خلال برامج التدريب والندوات المهنية.

وزارة التعلم العالي والبحث العلمي

جامعة بابل/ كلية التمريض

الأخطاء الدوائية والعوامل المساهمة بين ممرضين وحدات العناية المركزة

رسالة مقدمة من قبل

أسماء جبار صاحب

الى

مجلس كلية التمريض

كجزء من متطلبات نيل شهادة الماجستير في علوم التمريض

بأشـــراف

الأستـاذ

أ.د. أميــن عجيــل ياســر

جمادي الثاني / 1445 هجرية

حزيران / 2023 ميلادية