MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH

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Medication Errors: A Focus On Sedative And Analgesic Agents In Intensive Care And Burn Units In Diwaniyah Teaching Hospital And Burn Hospital

Graduation research

Submitted To College Of Pharmacy, University of Al-Qadisiyah

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﴿ وَقُلِ اعْمَلُوا فَسَيَرَى اللَّه عَمَلَكُمْ وَرَسُولُهُ وَالْمُؤْمِنُونَ وَسَتُرَدُّونَ إِلَى عَالِمِ الْغَيْبِ وَالشهَادَةِ فَيُنَبئُكُمْ بِمَا كُنْتُمْ تَعْمَلُونَ ﴾

صدق الله العلي العظيم

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Supervisor Certificate

I Certify that this Project

(Medication Errors: A Focus On Sedative And Analgesic Agents In Intensive Care And Burn Units In Diwaniyah Teaching Hospital And Burn Hospital)

was prepared under our supervision at the College Of Pharmacy, University of Al-Qadisiyah as Graduation research

Signature

Professor

Dr.Bassim I. Mohammad

DEDICATION

To my lovely father,

My great mother,

My family and professors,

And to all who quench homeland with their blood to make us live peacefully

Marwa Akram
Naba mohammad

ACKNOWLGMENT

I am, first, extremely thankful and pay my gratitude to our greatest god.
I would like to express my gratitude to my supervisor Dr.Bassim Irheim Al-Sheibani for the useful comments, remarks and engagement through the learning process of this research.
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Summary

A cross-sectional study of medication errors of 80 prescriptions dispensed to critical ill patients in intensive care unit and burn unit in Diwaniya Teaching hospital and Specialized Burn Hospital collected from November 2017 till March 2018.

From these prescriptions, 66 included sedatives and analgesics (86 drugs).

The prescription cases in this study was distributed as following: Among these prescription, 54 from Burn Unit, 26 from Intensive care unit.

The percentage of medication errors identified was 100 %. The majority of medication errors identified was dose related , 48 was under dosing error (55.8%), 8 was over dosing error (9.3%) , 44 was timing error (51%) , 34 was length of therapy error (39.5%) , 33 was monitoring error (38.4%) , 2 was physical incompatibility error (3%) , and 14 was omission error (17.5%).

The most important causes for errors are related to poor communication between health care providers, poor communication between health care providers and patients, poor obtaining sufficient information from patients especially in children the same dose was given regardless the weight, poor adherence to guideline and instructions about the use of medication that for IV route especially infusion which the most recommended delivery system in critical ill patients, and poor monitoring which is very important for adjusting dose of sedatives and analgesics and for how long.

Chapter One

Introduction And Literature Review

1.1. Medication errors

There is no consensus about the definition of a medication error. A systematic literature review found 26 different terminologies employed for a medication error [1].
The United States National Coordinating Council for Medication Error Reporting and Prevention defines a medication error as:

<any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems, including prescribing, order communication, product labelling, packaging, and nomenclature, compounding, dispensing, distribution, administration, education, monitoring, and use> [2].

This definition is broad and suggests that errors are preventable at different levels. Medication error has also been defined as reduction in the probability of treatment being timely and effective, or an increase in the risk of harm relating to medicines and prescribing compared with generally accepted practice [3].

1.2. Classification of medication errors

There are a number of different approaches to classifying medication errors

- One approach is to base the classification on the stage in the sequence of medication use process, such as prescribing, transcribing, dispensing, administration or monitoring.
- Another approach is to consider the types of errors occurring, such as wrong medication, dose frequency, administration route or patient.
- A further approach classifies errors according to whether they occur from mistakes made when planning actions (knowledge-based or rule-based mistakes) or errors in the execution of appropriately planned actions (action-based errors, known as "slips", or memory-based errors, known as "lapses") figure 1

- Errors may also be classified according to their level of severity[4] .

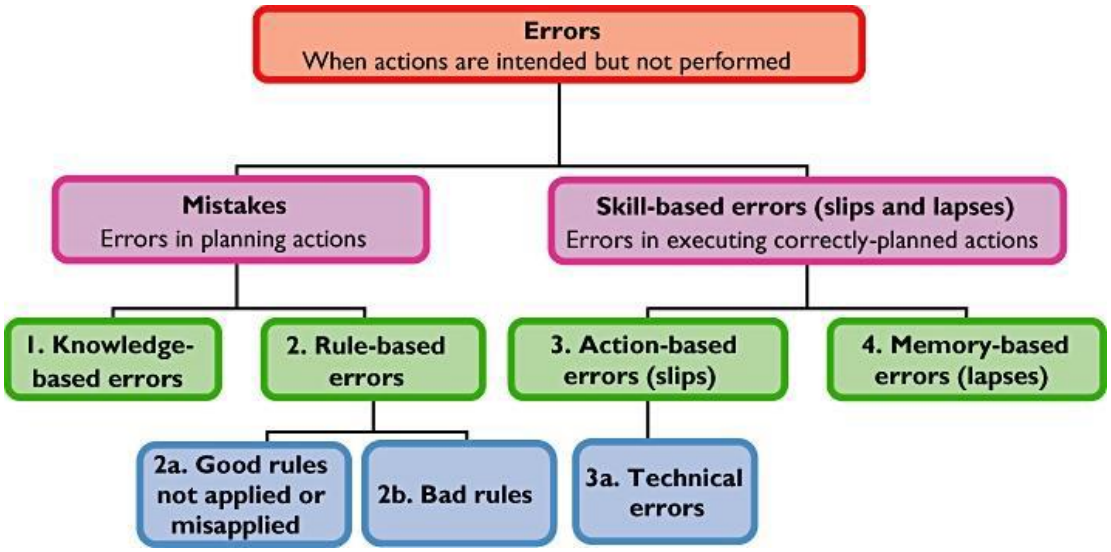

Figure 1: Classification of medication errors depending on their causes

1.3. Type of medication errors

There are different classification for medication errors, here we provide the common classification scheme based on the nature of the error

- **Prescribing Error :** Incorrect drug product selection (based on indications, contraindications, known allergies, existing drug therapy, and other factors), dose, dosage form, quantity, route of administration, concentration, rate of administration, length of therapy, or instructions for use of a drug product ordered or authorized by physician (or other legitimate prescriber); illegible prescriptions or medication orders that lead to errors.

- **Omission error :** The failure to administer an ordered dose to a patient before the next scheduled dose or failure to prescribe a drug product that is indicated for the patient. The failure to administer an ordered dose excludes patient's refusal and clinical decision or other valid reason not to administer.

- **Wrong time error :**Administration of medication outside a predefined time interval from its scheduled administration time (this interval should be established by each individual healthcare facility).

- **Unauthorized drug error :** Dispensing or administration to the patient of medication not authorized by a legitimate prescriber.

- **Dose error :** Dispensing or administration to the patient of a dose that is greater than or less than the amount ordered by the prescriber or administration of multiple doses to the patient, i.e. one or more dosage units in addition to those that were ordered.

- **Dosage form error :** Dispensing or administration to the patient of a drug product in a different dosage form than that ordered by the prescriber.

- **Route of administration error :** Wrong route of administration of the correct drug.

- **Administration technique error :** Inappropriate procedure or improper technique in the administration of a drug other than wrong route.

- **Deteriorated drug error :** Dispensing or administration of a drug that has expired or for which the physical or chemical dosage-form integrity has been compromised

- **Monitoring error :** Failure to review a prescribed regimen for appropriateness and detection of problems, or failure to use appropriate clinical or laboratory data for adequate assessment of patient response to prescribed therapy.

- **Compliance error :** Inappropriate patient behavior regarding adherence to a prescribed medication regimen.

- **Drug dispending error** : Drug product incorrectly formulated or manipulated before dispensing or administration.

- **Other medication error :** Any medication error that does not fall into one of the above predefined types, such us poor education of patient [(5)].

1.4. Sample strategies to prevent medication errors

Improved medication safety can be accomplished by optimizing the safety of the medication process, eliminating situational risk factors, and providing strategies to both intercept errors and mitigate their consequences. Several interventions have been shown to decrease medical error in the ICU[6] .

Sample strategies to prevent medication errors :

- Optimize the medication process

    1. Medication standardization

    2. Computerized physician order entry and clinical decision support

    3. Bar code technology

    4. Computerized intravenous infusion devices

    5. Medication reconciliation

- Eliminate situational risk factors

    1. Avoid excessive consecutive and cumulative working hours

    2. Minimize interruptions and distractions

    3. Trainee supervision and graduated responsibility

- Oversight and error interception

    1. Intensivist participation in ICU care

    2. Adequate staffing

    3. Pharmacist participation in ICU care

    4. Incorporation of quality assurance into academic education.

1.5. Critical ill patients

Critical illness is any disease process which causes physiological instability leading to disability or death within minutes or hours.
Perturbation of the neurological and cardiorespiratory systems generally has the most immediate life-threatening effects. Fortunately, such instability can be reliably detected by deviations from the normal range in simple clinical observations such as level of consciousness, respiratory rate, heart rate, blood pressure and urinary output. This is why such measurements feature in scoring systems to assess the severity of many common diseases such as the CRB-65 score for pneumonia (Lim et al, 2003) and the Glasgow score for pancreatitis (Blamey et al, 1984) [(7)] .

1.6. Pharmacokinetics and pharmacodynamics changes in critical ill Patients

The rapidly changing physiology of critically ill patients causes variations in the absorption, distribution, metabolism, excretion, and pharmacodynamic effect of drugs used to treat these patients. Alterations in fluid status, cardiac, renal and hepatic function, and circulating serum proteins necessitate increased attention to drug selection and dosage modification. Cardiac failure results in decreased absorption, metabolism, and excretion of drugs while renal failure results in parent drug and metabolite accumulation, increases in unbound drug, and changes in distribution volume. The changes in hepatic blood flow and protein binding, and decreases in hepatocellular mass and enzyme function that occur in hepatic failure may alter the clearance of several drugs. Serum drug concentrations are helpful in defining the pharmacokinetics and ultimately the pharmacodynamic effect of the drugs used in critically ill patients. The serum drug concentrations must be interpreted in association with their pharmacodynamic effect and the clinical situation. Adjusting drug therapy based on pharmacokinetic principles is discussed in detail with specific suggestions for dosage modifications in renal and hepatic failure Critically ill patients offer unique challenges in drug dosing due to the physiologic alterations that accompany severe illness and the rapidly changing status of these patients. An understanding of the pharmacokinetic implications of physiologic changes in critically ill patients and the impact of these implications on pharmacodynamics is helpful in selecting an initial dosing regimen and in making drug dosage adjustments when individualized dosing is not immediately available. The changes in cardiac output, renal function, hepatic function, and circulating serum proteins that

are commonly seen in the critically ill patient can alter the concentrations achieved and the rate and extent of drug elimination in these patients [8] .

Table 1: pharmacokinetic parameters in critical ill patients and their impact on the drug

PK Parameter	Physiologic Alteration	Impact on Drug PK
Absorption	Animal models – decreased GI motility	Possibly increased T_{max} for drugs absorbed in small intestines
Distribution	Vasodilation of skeletal muscle vasculature, decreased intravascular volume, decreased cardiac output, decreased lipid solubility of drugs Decreased plasma proteins	Possibly decreased Vd, decreased distribution into tissues Should increase Vd
Metabolism	Animal models – decreased hepatic blood flow and enzymatic activity, decreased plasma proteins	Possibly decreased hepatic metabolism
Elimination	Decreased renal blood flow, decreased plasma proteins Limitations in estimating CrCl	Possibly decreased renal clearance

Sunjic KM, Web AC, Sunjic I, et al. *Crit Care Med* 2015;43(10):2228-2238.

1.7. Analgesic and sedative agents used for management of critical ill patients

1.7.1. Benzodiazepines

Benzodiazepines produce sedation and hypnosis by modulating the effects of GABA, the main inhibitory neurotransmitter within the central nervous system. They bind to the $GABA_A$ ligand gated Cl^- ion channel. Benzodiazepines may be administered as bolus doses or by continuous infusion. They cause less haemodynamic compromise than i.v. anaesthetic agents. Concerns with their use include dependence and withdrawal agitation.They do not cause general anaesthesia, but will depress the respiratory center and cause cardiovascular depression. They are bound to plasma proteins and are not removed by dialysis[9].

1.7.2. Opioids

Opioids are the mainstays of the treatment of pain in the ICU. They are central nervous system μ receptor agonists that invoke analgesia, sedation, respiratory depression, constipation, urinary retention, nausea, and confusion. When administered parentrally in equivalent doses, there are no differences in analgesic effect, but pharmacokinetics, metabolism and side effects vary. The choice of agent therefore depends on the desired onset and duration of action and the potential adverse effects of the agent. In order to cross the blood brain barrier an opioid needs to be lipid soluble. Consequently when given as a bolus dose, duration of action of many opioids tends to be short due to redistribution into the large volume of fat stores; following infusion this compartment can become saturated and the effect substantially prolonged. There are few trials comparing the various opioids to each other in critically ill patients. There are no dosing recommendations given as doses need to be titrated to the needs of each individual[10].

1.7.3. Intravenous anesthetic agents

Intravenous (i.v.) anesthetics include etomidate, midazolam, propofol, thiopental, ketamine, and opioid agonists. The first four agents act by enhancing the activity of the inhibitory neurotransmitter γ-aminobutyric acid (GABA) in the CNS. Ketamine antagonizes the effect of the excitatory neurotransmitter *N*-methyl-D-aspartate (NMDA) on NMDA receptors, and opioid agonists stimulate opioid receptors [11].

1.7.4. Neuroleptic agents

Sedation is a common effect of conventional antipsychotics, especially when they are taken at high doses. Some of the atypical antipsychotic medications can also cause sedation, although it is generally less frequent and less severe than with conventional antipsychotics. Not all conventional antipsychotics have the same sedative effect, nor do all atypical antipsychotics. In general, the high-milligram, low-potency antipsychotics, such as chlorpromazine and mesoridazine, produce more sedation than the low-milligram, high-potency antipsychotics such as haloperidol and fluphenazine [12]. This principle tends to hold true for the atypical antipsychotics as well. Studies have indicated that sedation may also be related to the affinity of the medication for the histamine H_1 receptors. The antipsychotics vary in their ability to block these receptors. Astudy by

Richelson and Souder of the binding profiles of antipsychotic medications found that olanzapine has the highest affinity for the histamine H_1 receptors, followed by clozapine . This may explain why olanzapine has a relatively large sedative effect even though it is a high-potency medication. Of the antipsychotics studied, haloperidol had the lowest affinity for the histamine H_1 receptors. Quetiapine and risperidone had the lowest affinity of the atypical antipsychotic[13].

1.7.5. Alpha agonist

The α_2-adrenergic receptor is classically located on vascular prejunctional terminals where it inhibits the release of norepinephrine (noradrenaline) in a form of negative feedback .It is also located on the vascular smooth muscle cells of certain blood vessels, such as those found in skin arterioles or on veins, where it sits alongside the more plentiful α_1-adrenergic receptor[14]. The α_2-adrenergic receptor binds both norepinephrine released by sympathetic postganglionic fibers and epinephrine (adrenaline) released by the adrenal medulla, binding norepinephrine (noradrenaline) with slightly higher affinity[15]. It has several general functions in common with the α_1-adrenergic receptor, but also has specific effects of its own. Agonists (activators) of the α_2-adrenergic receptor are frequently used in veterinary anaesthesia where they affect sedation, muscle relaxation and analgesia through effects on the central nervous system (CNS)[16] .

Table 2: drugs commonly used for sedation in ICU

Class of drug	Examples	Advantages	Disadvantages
I.V. induction agents	Propofol	Reduced duration of ventilation compared with benzodiazepines; little significant accumulation	Bradycardia; decreased systemic vascular resistance; propofol infusion syndrome
Neuroleptic agents	Haloperidol; chlorpromazine	Neurolepsis; profound sedation; minimal respiratory depression	Extrapyrimidal signs; hypotension; Q-T prolongation

Class of drug	Examples	Advantages	Disadvantages
Benzodiazepines	Midazolam; lorazediazepam	Anxiolysis; haemodynamic stability	Dependence; withdrawal agitation; active metabolites (midazolam, diazepam); long elimination half-life (diazepam)
Opioids	Morphine; fentanyl; alfentanil; remifentanil	Analgesia; anxiolysis	Respiratory depression; bradycardia; respiratory depression; hypotension; nausea; constipation
Alpha agonists	Clonidine	Analgesia; anxiolysis; minimal respiratory depression	Rebound hypertension; hypotension; bradycardia; elimination delayed in renal failure

1.7.6. Non opioid analgesics

1.7.6.1. Paracetamol

Paracetamol is an antagonist of the cyclooxygenase system that inhibits the production of thromboxane in the pain pathway. It is available in enteral and 37 intravenous forms. It also possesses potent antipyretic properties. The regular administration of Paracetamol may reduce the requirement for opioids in postoperative pain [(17),(18)].

1.7.6.2. Non-Steroidal Analgesics (NSAIDS)

NSAIDS such as ibuprofen, diclofenac and ketoprofen non-selectively inhibit cyclooxygenase and may be used as adjuncts to opioid therapy in

selected patients in the ICU. They should be used with caution as they may cause acute kidney injury and gastric erosion through their action on renal production of prostacyclin. They also carry an increased risk of cardiovascular events including myocardial infarction and stroke [19].

1.7.6.3. Tramadol

Tramadol is a centrally acting synthetic opioid developed in the late 1970's. It is a weak agonist at the μ-opioid receptor, releases serotonin and inhibits the re-uptake of norepinephrine. It is a synthetic analogue of codeine and is converted in the liver to O-desmethyltramadol which is a potent μ-opioid agonist. Tramadol is used in a similarly way to codeine to treat moderate pain and is pharmacologically similar to levorphanol as it is an NMDA-antagonist and molecularly similar to venlafaxine. There are more potent and effective opioid analgesics than tramadol that can be administered safely in critical care because of the ability to monitor potential respiratory depression easily in a well-staffed critical care area. It can cause reduction in seizure threshold. When combined with tricyclic antidepressant can reduce seizure threshold even further. There have been rare cases of patients having grand mal seizures on doses as low as 100 – 400mg orally [20],[21].

1.8. Monitoring of sedation and analgesia

Effective management of analgesia and sedation in the intensive care unit (ICU) setting requires an assessment of the needs of the patient, subjective and/or objective measurement of the key variables (such as pain, agitation, and level of consciousness), and titration of therapy to achieve specific targets . It is important to recognize that patient needs can differ depending upon clinical circumstances, and that for any given patient therapeutic targets are likely to change over time. Thus, achieving patient comfort and ensuring patient safety, including avoidance of excessive or prolonged sedation, relies on accurately measuring pain, agitation, sedation, and other related variables utilizing validated tools that are easy to use, precise, accurate, and sufficiently robust to include a wide range of behaviors. The consequences of inadequate control of pain or agitation are considerable, but excessive or prolonged sedation is also problematic, leading to increased risk for complications of critical care patients , here we need for clinical scoring system [22].

Table 3: The Bloomsbury sedation scale

Sedation score	
3	Agitated and restless
2	Awake and comfortable
1	Aware but calm
0	Roused by voice
−1	Roused by touch
−2	Roused by painful stimuli
−3	Unrousable
A	Natural sleep
P	Paralyzed

1.9. Sedation protocols

Sedation protocols should be standard in every critical care, and followed by nursing and medical staff. An example of a sedation protocol iclinical use is given in Figure 2. Such protocols should be regularly updated. Titration of individual patients' sedation throughout their ICU admission should reduce over-sedation and side-effects, and contribute to reduced duration of mechanical ventilation and length of stay[23].

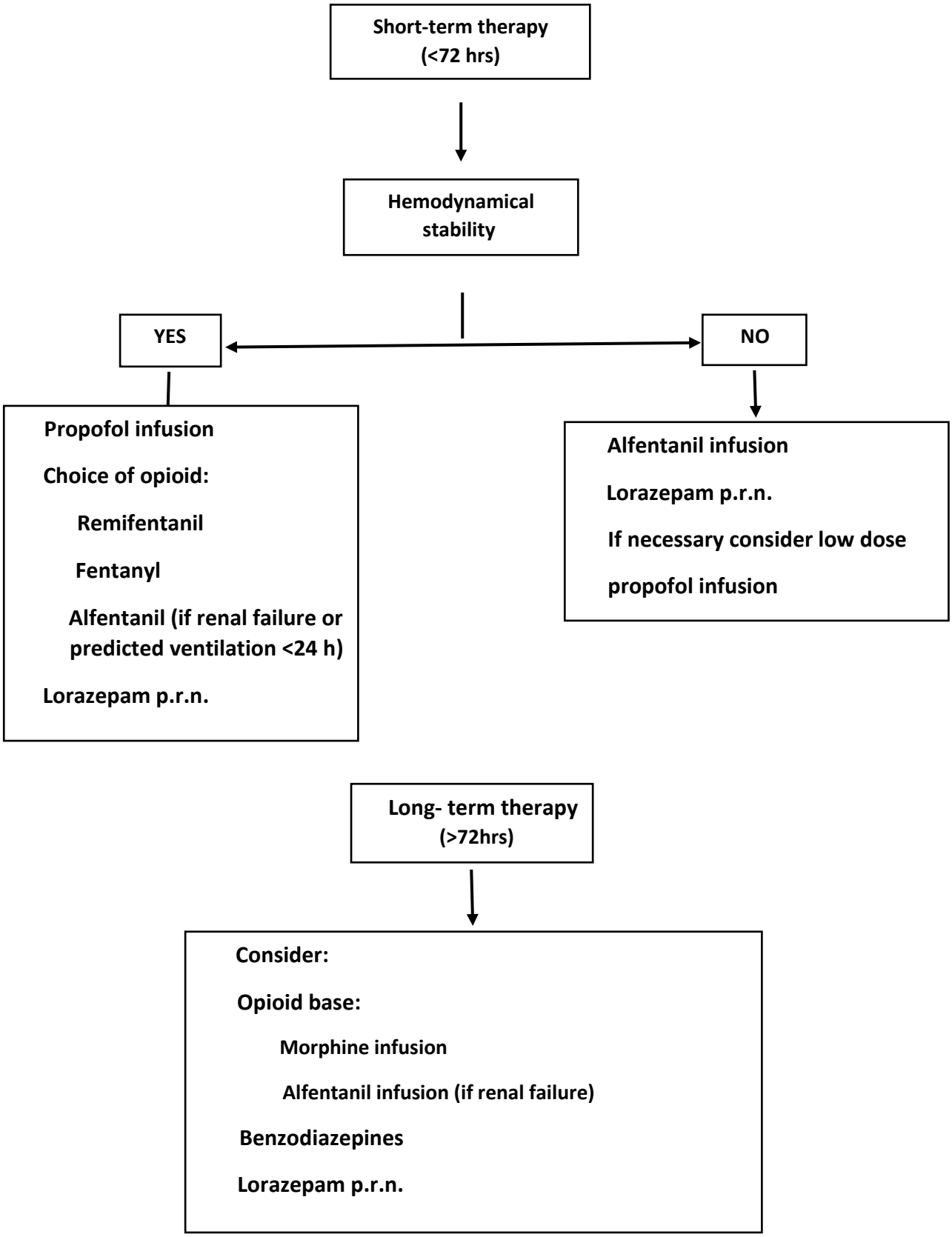

Figure 2: An example of sedation protocol in clinical use

1.10. Sedation holiday

A sedation holiday involves stopping the sedative infusions and allowing the patient to wake. The infusion should only be restarted once the patient is fully awake and obeying commands or until they became uncomfortable or agitated and deemed to require the resumption of sedation. Ideally, this should be performed on a daily basis. This strategy has been shown to decrease the duration of mechanical ventilation and the length of stay in ICU, without increasing adverse events such as self-extubation[24].

1.11. Research Question

1- What is the frequency of medication errors related to analgesic and sedative drugs in ICU and Burn units in Diwaniyah Teaching hospital and Specialized Burn Hospital?

2- What is the impact of these medication errors?

1.12. The aim of research

1- Investigate the frequency of medication errors related to analgesic and sedative agents in ICU and Burn in Al-Diwaniyah teaching Hospital and Specialized Burn Hospital.

2- Assess the impact of these medication errors.

Chapter two

Materials And Methods

2.1. Subjects

A study was approved by scientific committee, pharmacy collage university of Al- Qadisiyah, Iraq, verbal informed consent of the pharmacist was taken.

A total 80 prescription files included in this study were collected from November 2017 till March 2018.

2.2. Patients group

The study performed on 80 patient (36 male and 44 female) the patient ages ranged between (7 months - 72 years)

Patients were diagnosed by specialist physicians in ICU in Al Diwaniyah Teaching Hospital and burns hospital

All patient were suffered from:

1- Acute coronary syndrome include:
- Unstable angina
- STEMI
- Non-STEMI

2- 2^{nd} and 3^{rd} degree burn
3- Head injury

2.3. Method

A formula was used to collect data include:

- The name of patient
- Age
- Doctor's diagnosis
- Drug dispensed
- The dose, route, duration, frequency and strength

BNF 73 and drug.com drug interactions checker used to identify the drug interaction.

We recorded and discuss all details related to medication give to patient in each single day of admission, and that include:

- Drug name
- Dosage form (tablet, capsule, vial, ampule...)
- Route of administration (oral, sublingual, parenteral like intravenous, intramuscular, subcutaneous...)
- Way of administration (for example if parenteral route give as direct intravenous injection or by Intravenous fluid)
- Duration of administration
- Frequency
- The type of fluid use (normal saline, glucose water, ringer solution..) and the type of intravenous bag use (glass, polylfin, plastic....)
- Dose

Chapter Three

Results And Discussion

3.1. Results

Total number of prescriptions involved in the study was 80 prescriptions. From these prescriptions, 66 included sedatives and analgesics (86 drugs). The prescription cases in this study was distributed as following: Among these prescription, 54 from Burn Unit which involve 2nd and 3rd degree burn, 26 from Intensive care unit which involve 24 Acute Coronary Syndrome and 2 head injury (table 4) .

Table 4: Percentage of critical ill patients according to the disease

Disease	Number of patients	Percentage %
ACS	24	30 %
Burns	54	67 %
Head injury	2	2.5 %

The sedatives and analgesics prescribed to the patient were distributed as following : Paracetamol was mostly prescribed 69.11 % followed by tramadol 36 % , mefenamic acid 3.49 % , diazepam 2.3 % , morphine 2.3 % and diclofenac 0.01 % (table 5) .

Table 5: Type of sedative and analgesic agents given to Critical Ill Patients (from 86 agents)

Drug	Number of drug in prescriptions	Percentage %
Paracetamol	47	69.11 %
Tramadol	31	36 %
Mefenamic acid	3	3.49 %
Diazepam	2	2.3 %
Morphine	2	2.3 %
Diclofenac	1	0.01 %
Total	86	

The majority of medication errors identified was dose related, 48 was under dosing error (55.8%), 8 was over dosing error (9.3%), 44 was wrong time error (51%), 34 was length of therapy error (39.5%), 33 was monitoring error (38.4%), 2 was physical incompatibility error (3%), and 14 was omission error (17.5 %). (Table 6)

Table 6: the different medication errors types percentage of a total 85 sedative and analgesic prescribed

Type of Error	No. of Error	Percentage %
Over dosing	8	9.3%
Under dosing	48	55.8%
Monitoring error	33	38.4%
Wrong Time error	44	51%
Error in length of therapy	34	39.5%
Physical incompatibility	2	3%
Omission error	14	17.5%

Of 75 sedatives and analgesics interaction identified there was 27 major interaction (36%), 22 moderate interaction (29.3%), and 26 minor interaction (34.7%). (Table 7)

Table7: The severity of sedatives and analgesic interaction

Severity	No. of interaction	Percentage %
Major interaction	27	36%
Moderate interaction	22	29.3%
Minor interactions	26	34.7%
Total	75	

Also of 75 analgesic and sedative interactions, there was 54 adverse interactions (72%) and 21 favorable interactions (28%). (Table 8)

Table 8: Risk of drug-drug interaction identified

Risk	No. of interaction	Percentage %
Adverse	54	72%
Favorable	21	28%

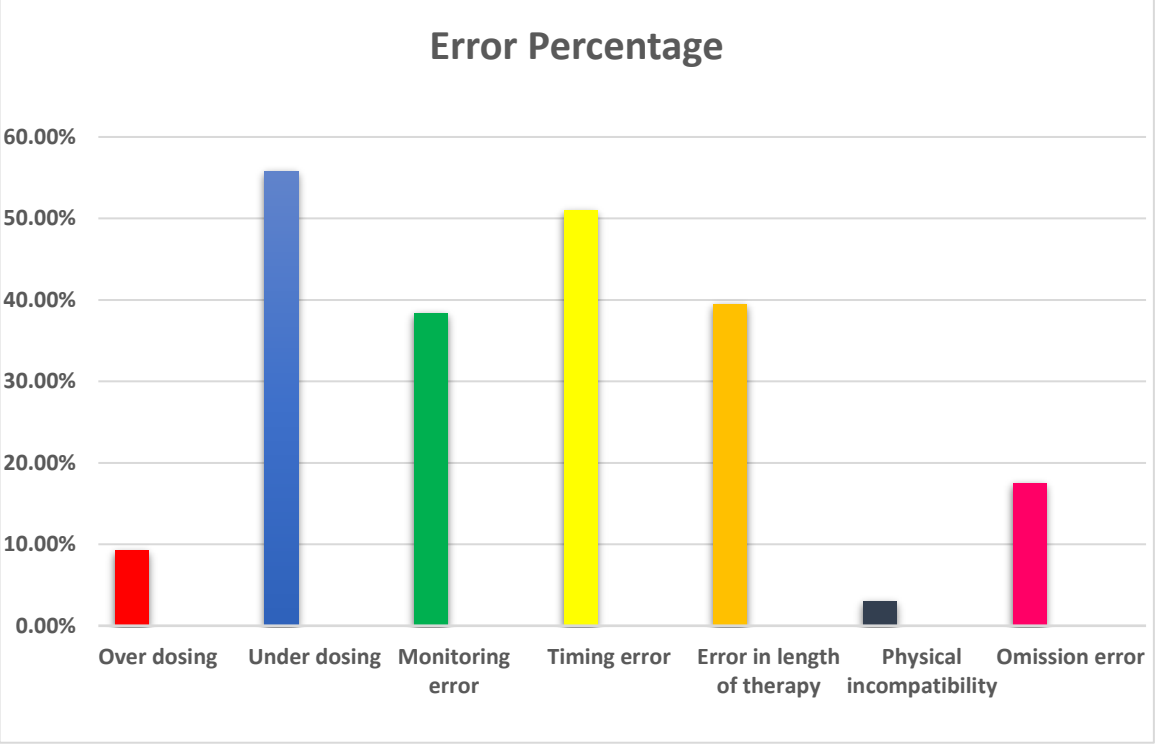

Figure3: This chart represent the present of each type of medication error

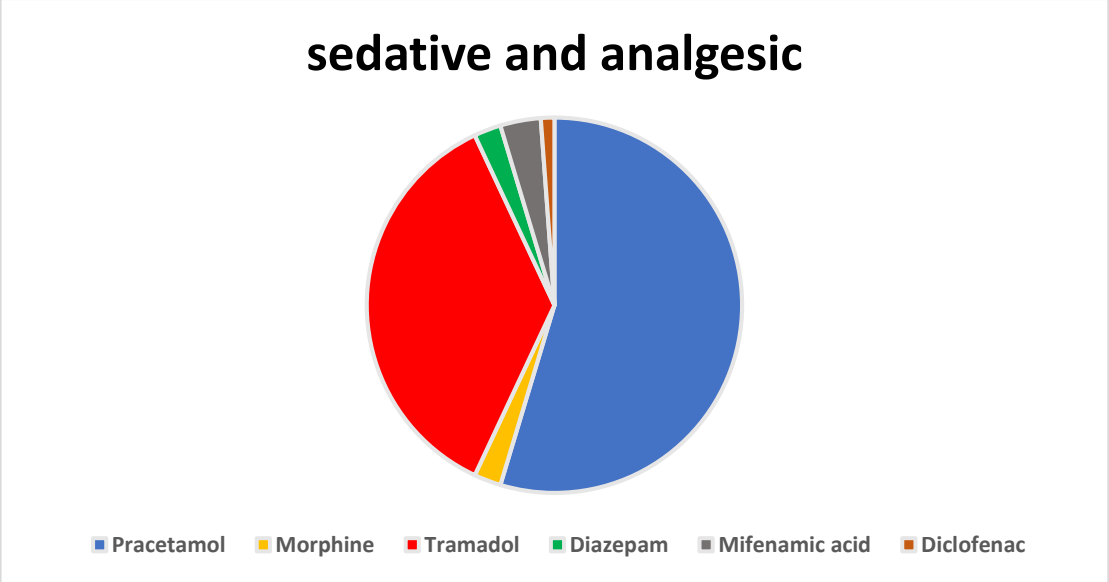

Figure 4: This pie chart show the percent of sedative and analgesic agents given to Critical Ill Patients in Diwaniyah Teaching hospital and Burn Hospital

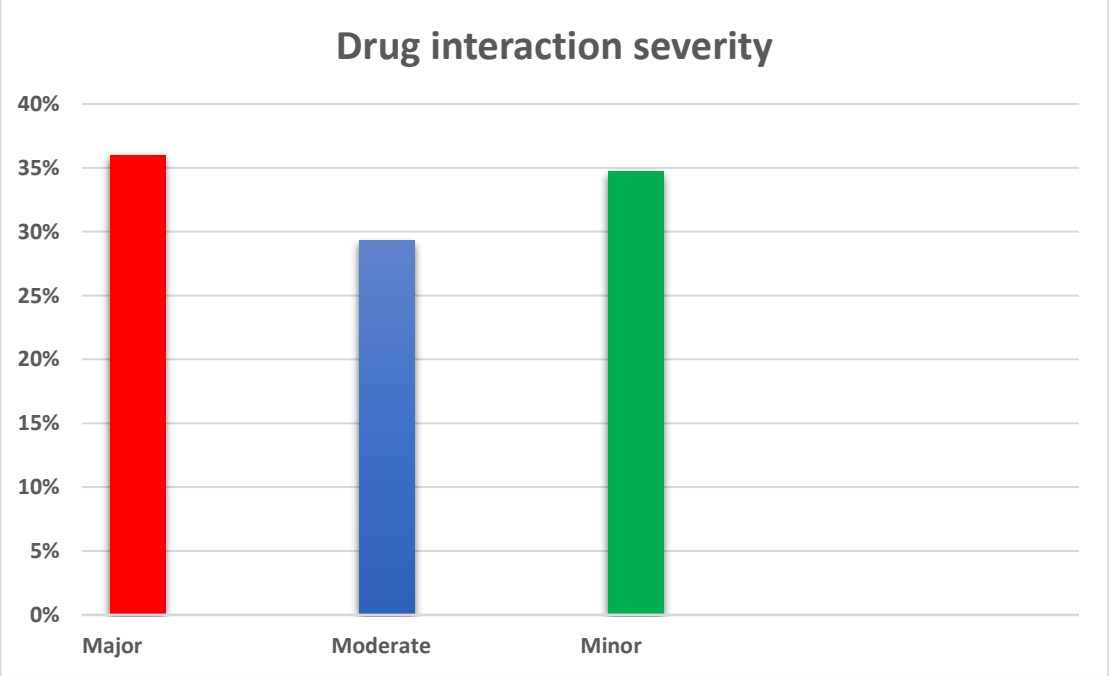

Figure 5: This chart show the percent of severity of drug- drug interactions

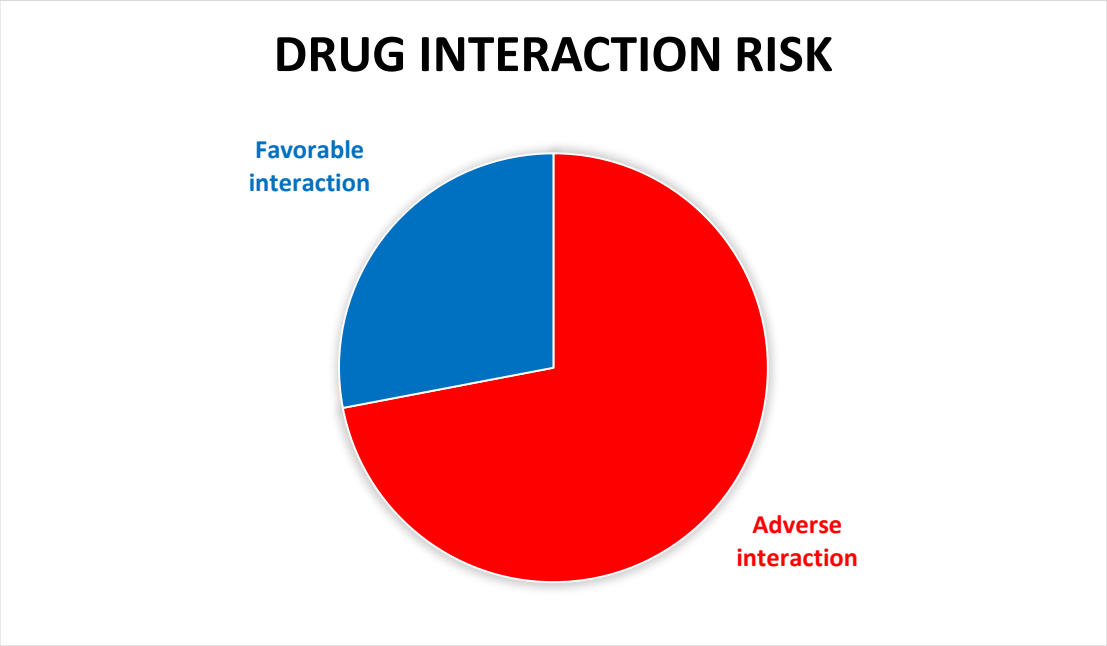

Figure 6: This pie chart show the percent risk of drug- drug interactions

3.2. Discussion

Medication errors identified in sedatives and analgesics

Total number of prescriptions involved in this study is 80, 66 were sedatives and analgesics, of 66 sedatives and analgesics 86 agents were used .

The majority of medication errors identified was :

- 48 was under dosing error (55.8%) , 8 was over dosing error (9.3%), under dosing have been seen in tramadol and Paracetamol while over dosing in Paracetamol only , high or low doses based on comparison with the doses mentioned in BNF book, high doses can give arise for adverse drug effect where low doses can give rise to un treated patient .

- 44 was wrong time error (51%), which have been seen in tramadol and Paracetamol, for relieving pain it is necessary to administer the drug at regular interval rather than as required.

- 34 was length of therapy error (39.5%), which have been seen in tramadol and mefenamic acid.

- 33 was monitoring error (38.4%) , which have been seen tramadol and diazepam , the mointring is too important for adjusting the dose of sedative and analgesics and for how long.

- 2 was physical incompatibility error (3%), which have been seen in diazepam and Paracetamol in which they are given in the same iv fluid .

- 14 was omission error (17.5 %), which include indicated patients but not receive sedatives and analgesics.

Drug-drug interaction found in the prescription:

Major interaction

Tramadol + Diazepam:

Using narcotic pain or cough medications together with other medications that also cause central nervous system depression can lead to serious side effects including respiratory distress, coma, and even death.

Tramadol+ Metoclopramide:

Tramadol may rarely cause seizures, and combining it with other medications that can also cause seizures such as Metoclopramide may increase that risk.

Tramadol+ Meropenem:

Tramadol may rarely cause seizures, and combining it with other medications that can also cause seizures such as Meropenem may increase that risk.

Moderate interaction

Diazepam+ Metoclopramide:

Using Diazepam together with Metoclopramide may increase side effects such as dizziness, drowsiness, confusion, and difficulty concentrating.

Tramadol + Diphenhydramine:

Using Diphenhydramine together with Tramadol may increase side effects such as dizziness, drowsiness, confusion, and difficulty concentrating.

Tramadol + Chlorphinramine:

Using Chlorpheniramine together with Tramadol may increase side effects such as dizziness, drowsiness, confusion, and difficulty concentrating.

Diazepam + Diphenhydramine:

Using Diphenhydramine together with Tramadol may increase side effects such as dizziness, drowsiness, confusion, and difficulty concentrating.

Mefenamic acid+ Hydrocortisone:

Using Hydrocortisone together with Mefenamic acid may increase the risk of side effects in the gastrointestinal tract such as inflammation, bleeding, ulceration, and rarely, perforation.

Minor interaction

Paracetamol+ Ranitidine:

Ranitidine may potentiate hepatotoxicity of acetaminophen.

Chapter Four

Conclusions And Recommendation

4.1. Conclusion

- ❖ The overall frequency of medication errors was 100%.

- ❖ Types of medication errors were mostly drug-drug interaction, dose related error, and monitoring error.

- ❖ Among the prescription involved, adverse drug interaction is higher than favorable one.

- ❖ We think the causes of these errors was due to:

- Poor communication between health care providers.
- Poor communication between health care providers and patients.
- Poor obtaining sufficient information from patients especially in children the same dose was given regardless the weight.
- Poor adherence to guideline and instructions about the use of medication that for IV route especially infusion, which is the most recommended delivery system in critical ill patients .

- Poor monitoring which is very important for adjusting dose of sedatives and analgesics and for how long.

4.2. Recommendation

- Adherence to the treatment guidelines.

- Encouraging a proper doctor-pharmacist and pharmacist–patient communication.

- Further studies to assess the impact of medications errors in patient with critical illness in ICU and burn unit.

Chapter Five

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وزارة التعليم العالي والبحث العلمي

جامعه القادسية

كليه الصيدلة

دراسة حول الاخطاء الطبية التي تخص الادوية المسكنة والمهدئة في العناية المركزة لكل من مستشفى الديوانية التعليمي و مستشفى الحروق التخصصي

بحث تخرج مقدم إلى جامعة القادسية , كلية الصيدلة

تقدم به كلُ من:

الطالبة مروة اكرم طارق و الطالبة نبأ محمد باقر

بأشراف

الأستاذ الدكتور

د.باسم أرحيم محمد الشيباني

كلية الصيدلة , جامعة القادسية

الخلاصة :

تضمنت هذه الدراسة 80 وصفة طبية صرفت لمرضى وحدة الحروق ووحدة العناية القلبية المركزة في شهر نوفمبر من العام 2017 .

من هذه الوصفات ،66 وصفه احتوت ادوية مسكنة ومهدئة . كانت النسبة المئوية للأخطاء الدوائية التي تم تحديدها 100٪.

غالبية الأخطاء الدوائية التي تم تحديدها كانت مرتبطة بالجرعة ، 48 جرع قليله (55.8٪) ، 44 خطا في توقيت الدواء (51٪) ، بالاضافة الى اخطاء دوائيه اخرى.

تمت هذه الدراسة باستخدام جداول لجمع المعلومات الخاصة بالمريض والمعلومات الخاصة بالادوية .

ترتبط أهم أسباب الأخطاء بضعف التواصل بين مقدمي الرعاية الصحية ، وضعف التواصل بين مقدمي الرعاية الصحية والمرضى ، وقلة الحصول على معلومات كافية من المرضى خاصة لدى الاطفال حيث تم إعطاء نفس الجرعة لجميع المرضى بغض النظر عن الوزن ، والالتزام الضعيف بالمبادئ التوجيهية والتعليمات حول استخدام الادوية وسوء مراقبة المرضى لتحديد جرعات الادوية المسكنة والمهدئة ومدتها.

تم اخذ الموافقات اللازمة للبدء بهذا البحث ابتداء من عمادة كلية الصيدلة جامعة القادسية بالاضافة الى موافقة المستشفيات لغرض جمع الوصفات الطبية.... .