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A Comprehensive Review of Medication Errors in Modern Healthcare

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Abstract

Medication errors are regarded as a significant contributor to the morbidity and mortality rates among patients. These errors encompass any mistake made during the prescription, dispensing, administration, or consumption of medication, as well as the monitoring of therapy. Such errors often stem from factors such as insufficient knowledge, limited staff and resources, issues with medication naming and labeling, and inadequate communication among patients, physicians, and pharmacists. Nonetheless, it is crucial to detect these errors, as shortcomings in healthcare systems can lead to seemingly minor mistakes like misuse and abuse, which may ultimately result in more serious errors. The act of reporting a medication error holds great importance in enhancing the quality of life for patients and reducing the financial burden of re-hospitalization. The primary responsibility of a clinical pharmacist is to identify and assess medication errors with the aim of enhancing patient safety and therapeutic results. By closely monitoring the drug therapy administered to patients in a hospital setting and promptly informing healthcare providers of any inconsistencies discovered, the likelihood of medication errors occurring in hospitalized patients can be minimized.

Keywords: Medication error, misuse, patient safety, quality of life

INTRODUCTION:

Health services worldwide provide medications, yet the escalating and significant utilization of medication poses an escalating threat of harm [1].

The World Health Organization (WHO) has designated a medication error as "any avoidable incident that could result in or contribute to inappropriate medication utilization or harm to the patient while the medication is under the supervision of a healthcare provider, patient, or consumer." [2].

APPROACHES OF MEDICATION ERROR (WHO STRATEGIES)

The World Wellbeing Organization (WHO) counseled with pros within the field who were suggested by the More secure Essential Care Master Working Bunch and inspected the relevant investigate and distributed thinks about. Distinguished global specialists in ensuring the safety of primary care shared insights, successful strategies implemented worldwide, and viable recommendations on key areas for countries to enhance the safety of their primary care services [2].

The Strategic Framework of the Global Patient Safety Challenge it outlines the four spaces of the Challenge, which incorporate patients and the open, wellbeing care experts, medications, and frameworks and hones of medicine. Each space is depicted through four subdomains. The system portrays each space through four subdomains. The three vital regions of activity, particularly polypharmacy, high-risk circumstances, and moves of care, are germane in each space and hence constitute an inward circle.
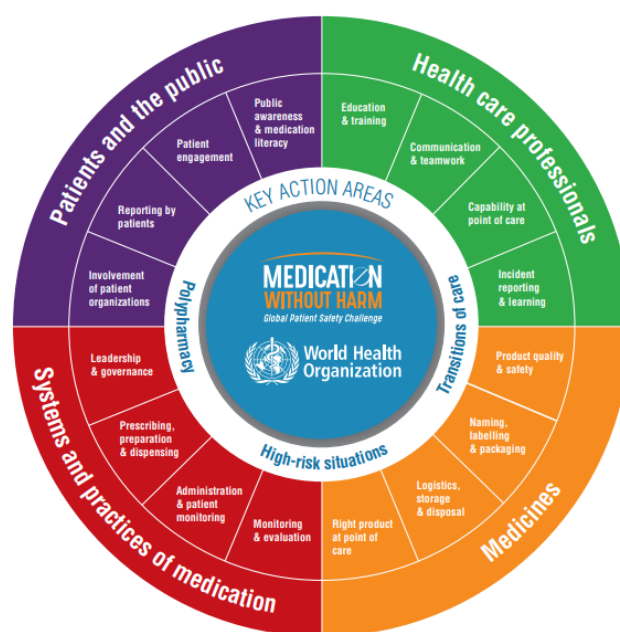

Figure 1: Who Guidelines For Strategies Framework Of The Four Domains [2]

The definition of a medicine mistake, agreeing to the National Planning Chamber for Pharmaceutical Blunder Detailing and Avoidance, includes any preventable event that has the potential to result in unseemly pharmaceutical utilization or hurt to the persistent whereas the pharmaceutical is beneath the supervision of a healthcare supplier, understanding, or buyer. Such incidents may be associated with various aspects of healthcare practice, health-related products, processes, and frameworks, which include Prescription, order communication, product labeling, packaging, and name, as well as compounding, dispensing, distribution, administration, education, monitoring, and use [3]. A medication error is described as 'a deficiency in the process of medical care that results in, or has the possibility to result in, injury to the patient' [4].

CAUSES OF MEDICATION ERROR:

Medication errors can lead to both reversible and irreversible complications, ultimately leading to increased costs and even higher mortality rates [4]. The absence of proper training, lack of guidelines for medication administration, disruptions during the medication administration process, and non-adherence to the principles of medication administration were identified as significant factors associated with medication errors [5].

Table 1: Factors that are significantly associated with medication errors [6]

The factors that are linked to healthcare professionals are:	Insufficient training in therapy.
	Lack of experience and knowledge of drugs.
	Limited information of the understanding.
	Insufficient chance recognition.
	Overworked or exhausted experts.
	Physical and enthusiastic wellbeing issues.
	Ineffective communication inside and between healthcare suppliers and patients
Factors related to patients	Patient characteristics.
	Complexity of the clinical case.
Factors linked with medications:	The naming of medicines
	The labelling and packaging of medications
Factors related to the work environment include	High workload and time constraints
	Limited availability of resources
	Inadequate standardisation of protocols and procedures
	Disturbances and disruptions from both primary care staff and patients
	Issues with the workplace environment, like the light, temperature, and air flow.

FACTORS THAT MAY INFLUENCE MEDICATION ERRORS:

Lack of therapeutic training- Therapeutic training insufficiency arises from the absence of competent and proficient medical healthcare personnel, a lack of awareness regarding patients' and drug dosage calculations, [6] insufficient pre-administration assessment, limited experience, as well as pharmacists' deficiency in skills and confidence to deliver clinical pharmacy services within the primary care team. Deficiencies in knowledge, expertise, and apprehension of scrutiny lead to challenges and reduced motivation [7]. The absence of on-the-job training, combined with the lower emphasis placed on clinical pharmacy services, obstructs the involvement of pharmacists.

Inadequate drug knowledge - The absence of clinical training and expertise in the undergraduate pharmacy education, insufficiency in staff numbers, insufficient pharmaceutical knowledge [6], as well as time constraints represent several obstacles encountered by pharmacists providing clinical care services. Initiatives in education and training that prioritize the improvement of clinical knowledge, skills, and attitudes have the potential to surmount these obstacles [8].

Work load and time- Their functionality could be impacted by fatigue, which may result in MEs. They pinpointed various factors that contribute to fatigue, such as sleep deprivation, inadequate task completion, task delays, multitasking, and the inability to attend educational activities due to work demands. Additionally, heavy overtime work and long work days were identified as factors that contribute to fatigue [9].

Issues with working environment- Identified problems with the working environment include changes in the general environment, such as noise, lighting, emergencies, short staffing, workload, patient acuity, lack of supervision, and busy or chaotic working conditions.

Medication error with prescription:

▪ **Use of Abbreviations:** Medicine blunders are commonly caused by the utilize of shortened forms. In some cases, the recurrence of organization is abbreviated utilizing additions like QD, OS, TID, QID, PR, and so on. Be that as it may, this will lead to disarray as QD (meaning once a day) can be effortlessly mixed up for QID (four times a day). In addition, these truncations can have different translations and be confused. To avoid any confusion, it is advised to refrain from using abbreviations when writing medication orders [10].

▪ **Look alike medicines bottles**

1. 0.9% Normal saline 100ml of Infusion bottle, Metronidazole 100ml, Mannitol 100ml, 25% Dextrose 100ml are the infusion bottles that look alike.

2. Nitroderm patch (Nitroglycerine) and Nicoderm patch (Nicotine) are the patches that are look alike.

3. Tablet Polaramine 2mg (Dexchlorpheniramine) and Tablet Pacitane 2mg (Trihexyphenydyl) Cut strips are look-alike medicines [11].

▪ **Look alike sound alike medications**

Many drug names are spelled or sound alike and are called sound-alike drugs. Some medicines or drugs look similar because they are made the same way or come in similar packaging.

Together, they can be grouped as medications that look and sound similar (LASA).

Example: Vincristine and Vinblastine

Naprosyn (Naproxen) and Nefrosa

CLASSIFICATION OF MEDICATION ERROR:

According to the American Society of Health-System Pharmacists (ASHP) has Guidelines on Prevention of Medication Errors, it can be categorized into eleven types:

i. **Prescribing Errors:** A prescribing mistake happens when a doctor prescribes a medication for a particular patient. Mistakes can involve choosing the wrong drug, dosage, form, administration route, duration of treatment, or number of doses. Other errors in prescribing include using the wrong drug concentration, inappropriate rate of administration, and providing insufficient or incorrect instructions for use.

ii. **Omission Errors:** Forgetting to give a dose is considered an omission error, rather than just giving it late.

iii. **Wrong Time Errors:** It's really important to take some medications at the right time for them to work properly. For certain drugs like antibiotics, it's crucial to space out doses evenly throughout the day and night to keep the blood level stable. Giving doses too soon or too late can mess with the drug's effectiveness.

iv. **Unauthorized Drug Errors:** Giving medicine to a patient without permission from the doctor is called an unauthorized drug mistake. This type of error can happen when a medication intended for one patient is mistakenly given to another patient or when a nurse administers medication without a valid order from the prescriber.

v. **Improper Dose Errors:** Incorrect dosage errors can happen when a patient receives a dosage that is either higher or lower than what was prescribed. This error may occur due to a lapse in recording the dosage or lack of documentation, leading to an extra dose being given [12].

vi. **Wrong Dosage Form Errors:** Errors occur when doses are given or provided in a form that differs from what was prescribed by the healthcare provider.

vii. **Wrong Drug Preparation Errors:** Some drugs need to be mixed with liquid before they can be used. This can lead to mistakes when preparing the drug.

viii. **Wrong Administration Technique Errors:** Incorrect administration techniques result from doses being administered improperly or using the wrong procedure.

ix. **Deteriorated Drug Errors:** Monitoring the expiration dates of products is of utmost importance, despite the occasional inconvenience it may cause. Using drugs that have exceeded their expiration date can result in a loss of potency, rendering them less effective or even ineffective. Additionally, refrigerated drugs stored at room temperature can decompose to a degree where their efficacy is compromised. It is crucial to avoid dispensing or administering medications that have expired or have deteriorated due to improper storage, as these instances are classified as deteriorated drug errors.

x. **Monitoring Errors:** Insufficient drug therapy review can lead to monitoring errors. One instance is neglecting to review ordered serum drug levels for a patient on phenytoin for seizure prevention, or failing to take action when levels fall outside the therapeutic range. Another example is omitting necessary drug level orders or prescribing an antihypertensive medication without monitoring the patient's blood pressure.

xi. **Compliance Errors:** Patients may commit medication errors when they do not comply with or adhere to their prescribed drug regimen. This is known as a compliance error. Detecting compliance errors can be done when a patient requests prescription refills at unreasonable intervals (either too long after or too soon before a refill is due) without providing a reasonable explanation. For instance, if a patient stops taking antibiotics to treat an infection before completing all the prescribed doses, it would be considered a compliance error.

● **Identification and Detection of medication errors in clinical practice:** Recognizing medicine mistakes is significant for progressing quiet security through the advancement of avoidance strategies and improving pharmaceutical administration amid Occurrence Reports, Understanding chart survey, Coordinate perceptions, Mediations by drug specialist, and Antagonistic sedate occasion trigger devices.

● **Medication Error reporting forms** usually contain the following elements:

1. Identifiable correspondent

2. Date of occurrence

3. Error portrayal

4. Name of drug(s) included

● **Serious hurtful impacts of a medicine mistake may incorporate :**

○ Disability

○ Life debilitating circumstance

○ Hospitalization

○ Mortality

○ Birth imperfection.

IMPACT OF MEDICATION ERRORS IN PEDIATRIC POPULATION AND THEIR SOLUTION

Administering medications in pediatrics carries a significant level of responsibility, given its direct effect on the security and well-being of the youthful patients beneath care [13].

Six factors were essentially related with MEs:

a. Medication reconstitution working environment,

b. Child weight,

c. Qualification of medicine chairman, and

d. Parent association within the pharmaceutical organization prepare,

e. Adherence with medicine organization rights,

f. Duration of hospital stay[14].

g. Dosage and administration error

Possible mitigation measure to reduce ME in pediatric population:

Patient Education: Pharmacists have a crucial role in providing patient education to parents and children regarding their medications. It is essential for each pharmacist to establish their own unique approach and manner of delivering this education[15].

Electronic prescribing systems: Studies have demonstrated notable advantages in decreasing medication errors, especially in pediatric patients who require weight-based dosing[16].

Integrating Weight-based Dosing into a Dose-based Prescribing System: When prescribing medications based on weight, healthcare professionals typically initiate treatment with a weight-based dosage, such as 30 mg/kg twice daily, rather than a fixed single dose. A unique bracketing algorithm is utilized to determine the nearest available doses and recommend the appropriate drug strengths, as well as the number of doses required to reach the desired dosage [16].

Empowering clinical trials for permitting sedate utilize in children through showcase restrictiveness and obvious expansion activities may offer assistance near the hole between sedate endorsement and current endorsing hones [17].

IMPACT OF MEDICATION ERRORS IN GERIATRIC POPULATION AND THEIR SOLUTION

Risk of elderly population having polypharmacy and care home

Among numerous causes of polypharmacy within the geriatric population. A couple of reasons are enlisted:

Patients are locks in in self-medication with over-the-counter medicines without appropriate mindfulness and a clear understanding of the unfavorable responses and intuitively impacts related with these solutions.

The rise in comorbidities within this demographic leads to an increase in the number of medications being taken.

The presence of newer medications and a growing curiosity towards them are noted within this context.

One patient frequently seeks advice from several physicians and adheres to each prescribed medication without undergoing appropriate therapeutic reconciliation.

Crosspathy involves the accessibility of crosspathy treatments such as Ayurveda and herbal medicines, which can lead to polypharmacy due to the frequent concurrent use of such medications.

Consequences of polypharmacy

In common, polypharmacy has been related with a assortment of undesirable results, counting feebleness, falls, and mortality. Concomitant admissions of different drugs regularly cause expanded antagonistic sedate occasions. Within the maturing populace, with numerous medicines and chances of modified sensorium, the chance of falls and fractures increases up. Polypharmacy within the geriatric populace increments the hazard of renal damage.

Possible mitigation measures to reduce ME in Geriatrics Population:

Healthcare professionals have the ability to enhance awareness among their colleagues about the significance of medication review in reducing the harm linked to inappropriate polypharmacy practices. Implementing strategies like incorporating compulsory education on safe medication management methods into medical school curricula, combined with a thorough understanding of the human factors influencing polypharmacy, can offer additional advantages in terms of patient interactions and facilitating shared decision-making.

Enhanced medication control and adherence are crucial aspects in the context of polypharmacy. It is essential to explore methodologies to enhance medication adherence and establish protocols to guarantee the correct medication is consumed at the appropriate time. Numerous medication adherence tools, commonly referred to as pill dispensers, have been introduced to the market and are demonstrating significant advantages for the elderly population.

The endeavors to diminish crosspathy: Traditional Indian medical systems such as Ayurveda, Yoga, Unani, and Siddha have been in existence long before the establishment of contemporary healthcare practices. With India embracing a diverse medical culture, there is a heightened risk of drug interactions in cases where self-medication results in undesired outcomes. Crosspathy refers to a practice wherein allopathic medications are combined with homeopathic, ayurvedic, siddha, or unani drugs.

Efforts to diminish self-medication: Utilizing medications without supervision, encompassing nonprescription drugs, traditional remedies, herbal products, and dietary supplements, is being addressed. Research indicates a notable prevalence of self-medication among the elderly. The reasons behind self-medication in this demographic are multifaceted. The high costs of treatment and inadequate insurance coverage have led many elderly individuals, unable to afford physician fees, to opt for self-medication.

MEDICATION ERRORS RELATED TO INJECTION USE

Weight dependent dosing

Patient weighing is a long-standing technique in healthcare delivery. However, when a patient's weight is collected, documented, or reported improperly it can result in serious and even fatal drug errors. These kinds of incidents can be completely prevented by putting into practice a thorough plan that promotes prompt and accurate patient weight-taking, guarantees accurate weight recording, and makes the patient's information easily accessible to those who are supervising medication. Create procedures for weight measurement and recording.

• Weight-based dosing strategies require pharmacological assessment.

• Ensuring the availability of sufficient and conveniently located equipment for patient weighing and medication administration is essential.

• To promote safe and appropriate dosing, the use of clinical decision support software and health information technology is advised.

- Wherever possible, standardization should be applied. For example, scales should be configured to default to metric and patient weight should be obtained and recorded in metric units. [18].

Mistakes may arise in the event that the dosage of medication is computed based on an imprecise measurement of the patient's weight. Consequently, it is imperative for healthcare establishments to establish protocols mandating that a prescription for medication is only processed when details regarding the patient's weight are accessible and duly noted in the medical records. Nonetheless, numerous incident reports forwarded to ECRI Institute PSO reveal instances where medication prescriptions are fulfilled even in the absence of information pertaining to the patient's weight. Furthermore, a considerable number of incident reports conveyed to ECRI Institute PSO demonstrate that errors in dosing based on weight can transpire despite the availability or documentation of the patient's weight. Instances of such inaccuracies encompass the subsequent scenarios:

- Near-double dosing errors can occur when a patient's weight is inaccurately estimated rather than precisely determined.

- Difficulty may arise in determining the correct medication dosage for a patient with obesity.

- There is a risk of miscalculating the dosage of a drug despite having obtained the accurate weight measurement [18].

Wrong route of administration: Errors in medication administration that are attributed to an incorrect route may account for up to 20% of all medication errors, predominantly occurring with drugs administered via IV push or infusions. Such incidents pose a particularly high risk with various medications, potentially leading to significant adverse reactions, For example, tachycardia brought on by an abrupt IV epinephrine infusion or red man syndrome brought on by an abrupt vancomycin administration [10].

The responsibility of ensuring the proper administration of medication to patients falls upon the nursing team, serving as a critical line of defense against errors. Nevertheless, it is imperative for healthcare professionals to receive adequate technical and scientific support to effectively and safely deliver pharmacotherapy [19].

OCCURRENCE OF MEDICATION ERROR IN HEALTH INDUSTRY

Physician Factors:

- **Miscommunication:** Incomplete or inaccurate communication of medication orders or dosage instructions.

- **Lack of Knowledge:** Insufficient understanding of drug interactions, contraindications, or proper dosages [20].

- **Fatigue and Stress:** Long working hours and high patient loads can lead to cognitive fatigue and increased likelihood of errors.

- **Electronic Health Record (EHR) Issues:** Difficulty navigating electronic systems or reliance on outdated information within EHRs [21].

Nurse Factors:

- **Distractions and Interruptions:** High-pressure environments with frequent interruptions can lead to errors in medication administration.

- **Medication Calculation Errors:** Miscalculations in dosages or infusion rates [22].

- **Workload and Time Pressure:** Heavy workload and time constraints may compromise attention to detail.

- **Inadequate Training:** Insufficient training or orientation on new medications and protocols [23].

Pharmacist Factors:

- **Dispensing Errors:** Mistakes in medication dispensing, labeling, or packaging.

- **Misinterpretation of Prescriptions:** Errors in interpreting handwritten prescriptions or verbal orders [24].

- **Medication Storage Issues:** Incorrect storage conditions leading to degradation or contamination of medications.

- **Lack of Communication:** Inadequate communication with patients or healthcare providers regarding medication instructions or potential risks [25].

THE INCREASING OCCURRENCE OF MEDICATION ERRORS IN MODERN HEALTHCARE SETTINGS

Every year, more than 100,000 reports of drug errors are received by the US Food and Drug Administration. Every hospital will have 10% of its patients experience a medication error [26].

When analysing the reasons behind medication errors, incomplete prescriptions account for 50% of the total errors. This is followed by incorrect medicine and dose, which account for 22.9% and 8% of the errors, respectively [27]. The most frequent reasons for prescription errors were incomplete prescriptions (58.5%), unreadable prescriptions (18.3%), and incorrect dosages (11%). Incorrect dosage administration (62%) and omission mistakes (22.4%) are the two most common types of administration errors [27].

Errors in the pharmaceutical process resulted in severe injury in 9 cases (16%) and were fatal in 21 cases (36%). Errors resulted in no severe damage in 8 out of 19 cases (33%) [28].

Medical errors cause about 530,00 injuries annually in outpatient clinics. Due to their propensity to take more prescriptions than younger adults, older patients are more likely to experience medical errors throughout their care [29].

BRIEF INTRODUCTION TO PATIENT SAFETY

- Patient safety is a fundamental component of healthcare, defined as the protection of patients from avoidable harm or potential risks associated with healthcare provision.

- It stands as a pivotal dimension of care quality, alongside aspects such as accessibility, acceptability, effectiveness, efficiency, and patient-centeredness.

- Patient safety encompasses various critical elements essential for the delivery of high-quality healthcare, including safe surgical procedures, childbirth, injection practices, blood transfusions, medication administration, medical device usage, organ transportation, waste management, infection prevention, and more.

- Globally, millions of patients suffer adverse effects annually, emphasizing the significance of infection prevention strategies, such as proper hand hygiene, which can substantially reduce healthcare-associated infections by over 50%.

- Even though there is a vast array of medical devices available on a global scale, a considerable proportion of the population does not have sufficient access to equipment

that are safe and appropriate inside their healthcare systems.

- Furthermore, a lot of low- and lower middle-income nations lack comprehensive national health technology policies, which are necessary to guarantee the effective use of resources when it comes to managing medical equipment.

- On a global scale, an estimated 234 million surgical procedures are conducted each year, posing a considerable risk of complications. Enhancing patient safety not only mitigates risks but also yields significant economic advantages.

- Industries perceived to have higher risks, such as aviation and nuclear sectors, boast superior safety records compared to healthcare, underscoring the compelling case for improving patient safety standards [11].

Current scenario of patient safety in India

A nation's legislative and regulatory structure, institutional procedures, national policies and initiatives, and stakeholder participation are all crucial for guaranteeing the standard of care provided. However, these components are highly dispersed in the current situation.

- The country does have laws, regulations, policies, and strategies in place to address the quality of care. Yet, there is a notable lack of cohesion among them.

- The Consumer Protection Act addresses medical malpractice and subpar services; however, it does not adequately define patients' rights. In the meanwhile, the Clinical Establishment Act (CEA) outlines the legal rights of patients, however its nationwide application is still lacking.

- The National Health System Resource Centre (NHSRC) is the federal institution in charge of executing the Quality Assurance program in public health facilities. The NHSRC developed the National Quality Assurance Standards to satisfy the unique patient safety and quality requirements of public health facilities. These standards fully fulfil the requirements of disease control programs as well as reproductive, maternal, new born, child, and adolescent health (RMNCHA) programs. [(30)]

MULTICOMPONENT INTERVENTIONS FOR AVOIDING MEDICATION ERROR

- **National patient safety implementation framework:** Patient safety, which refers to the absence of preventable injury or possible harm connected to the provision of healthcare services, is a crucial aspect of healthcare.

- Security of the patient is a fundamental dimension of quality care, aligning with accessibility, acceptability, effectiveness, efficiency, and people-centeredness [30].

- A number of crucial elements are included in patient safety to guarantee the delivery of top-notch medical care. It concerns the safe administration of medical devices, blood transfusions, injections, birthing, surgery, and the safe transit and donation of organs, tissues, and cells.

The kind, scope, and monitoring systems of unfavourable events

- There are assessment procedures in place, especially for programs like the Pharmacovigilance Program of India (PVPI) and Adverse Events Following Immunization (AEFI), to ascertain the total impact of substandard care within the nation.

- However, a complete patient safety incident surveillance system for reporting and learning from all adverse events and near-misses at the national and sub-national levels has only been established for specific occurrences such as needlestick injuries, pharmacovigilance, haemovigilance, and death audits. Root cause analysis is performed for specific events, such as maternal deaths, neonatal deaths, and AEFI, but not for all diseases or conditions. Nonetheless, the adherence to consistent standards across all institutions lacks regulatory oversight [30].

Health workforce: Education, training and performance

- Education, training, and performance aspects: The education, training, and performance evaluation of healthcare professionals involve processes such as registration, re-registration, certification, re-certification, and continuous professional development.

- Within the Indian Public Health Standards (IPHS), patient safety and infection control elements are integrated, with some provisions for budgetary allocation to facilitate the adoption and implementation of these standards, spanning from sub-centre to district levels.

- Although they are not always included in the patient safety paradigm, factors such as device safety, fire safety, earthquake safety, and the physical safety of healthcare facilities are important in the Indian setting.

Strategies for preventing medication errors:

1. Uphold the drug administration's five rights.

2. Employ appropriate procedures for medication reconciliation.

3. Verify processes two or three times.

4. Request that the doctor or another nurse read the prescription back.

Strategies for monitoring and evaluating Medication Errors:

i. Reporting Culture

One useful tool for identifying the possibility of future medical errors is a medical error reporting system. Some healthcare professionals neglect to report occurrences because they don't get management support, have unsupportive coworkers, are pressed for time, or don't grasp the situation.

Requirements for reporting could lead to legal action and harm the doctor-patient bond, which would force medical professionals to practice "defensive medicine." Reporting medical errors should not be a professional or ethical requirement for healthcare providers.

Reporting voluntarily enhances medical education and promotes a culture of safety. However, required reports have shown how beneficial participation in reporting medical errors can be [30].

It has been demonstrated that using incidence reporting systems, lowers events related to air travel; in theory, this also lowers medical errors in healthcare systems. Medical error reporting systems are commonly used these days. Reporting systems are classified as mandatory or optional. The most well-known systems are modeled after NASA's anonymous, voluntary Aviation Safety Report System (ASRS) for the Federal Aviation Administration. The voluntary systems that are being modeled after it include the Veterans Administration Patient Safety Reporting System (PSRS), the Institute for Safe Medical Practice (ISMP), which is intended for medical error reporting, and Data Watch, which was created by the US Food and Drug

Administration (US FDA) to record adverse events resulting from medications and therapeutic devices [30].

ii.   Analysis of Medication Error Reports:

National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) has created a medication error taxonomy tool to help healthcare providers and organizations describe, track, and analyze medication errors in a systematic and logical manner. Building a pharmaceutical error database and creating a form for reporting or collecting errors are two uses for the taxonomy. Healthcare companies should develop procedures and systems to collect the information needed to recognize and promptly report drug errors.

Recommendations to Improve Medication Errors Reporting Systems:

All medical facilities ought to make an effort to implement strategies that guarantee patients are not jeopardized by medication errors. Healthcare organizations can assess both past and anticipated errors and take proactive measures to eradicate them. This enables us to identify methods for falsely disclosing medication use, lowering the dangers to patients' health.

Medication reconciliation: Medication reconciliation is the process of matching the doctor's instructions for admission, transfer, and/or discharge with the most accurate list of all the medications a patient is taking, including the brand name, dosage, frequency, and route. The goal is to guarantee that the patient receives the appropriate prescriptions at every stage of their hospitalization. The Institute for Healthcare Improvement offers this definition [31].

Pharmacists have key roles in medication reconciliation: As a result of their proficiency in drug management, the World Health Organization (WHO) and other pertinent organizations have requested that pharmacists carry out the medication reconciliation procedure [32].

Pharmacists play crucial roles in medication reconciliation, including

1. Developing and supervising patient-centred procedures,

2. Teaching medical professionals and patients about the advantages and drawbacks,

3. Defending the rights of patients as they move between medical facilities.

4. Policies incorporating medication reconciliation strategies into the workflow and culture of the healthcare system should be created by pharmacists.

5. Pharmacy services may include continual quality improvement, training, and therapeutic expertise for information systems development [32].

Medication Review

Reviewing medications has long been thought to be a crucial strategy. Reviews of medications might indicate many different things. When a prescriber meets with a patient and decides whether to prescribe or stop a therapy, it could be a daily review of medications or a multidisciplinary medication review with the patient[33].

POTENTIAL SOLUTIONS

Electronic prescribing systems:

It have been found to provide significant benefits in decreasing drug errors. They are projected to be particularly beneficial in the pediatric population due to weight-based prescribing regulations [34].

Education of health care providers and patient:

The bulk of pharmaceuticals are still prescribed by doctors, despite the fact that many nurses and pharmacists have assumed prescription duties. Medical students and junior doctors feel that the prescription training provided by most medical schools to medical undergraduates is insufficient. After taking the online course, doctors' understanding of geriatric prescription fared better than that of those who did not.

Using computerized systems:

Over the past 15 years, a lot of research has been done on the effect that a computerized prescriber order entry (CPOE) system has on prescription errors. According to a recent systematic review, there is not enough data to support CPOE devices as a trustworthy means of reducing prescription errors. Small sample sizes and poor study design limit the evidence supporting CPOE and prescribing errors.

Bar-coded medication administration:

A nurse will frequently scan a bar code on the patient's wristband, the employee ID card, and the medication to be administered during bar-coded medicine delivery. The data is sent from the portable computer by the patient's bed to a server, which validates the prescription. In addition to providing administration instructions and drug information, the system can offer warnings or approvals and send reminders for additional activities. When a drug is administered, the system records the action in the patient's medication record for later review [35].

Personal health records (PHR):

The patient is empowered to participate in their own healthcare. A PHR is now defined as "a combination of computer-based tools that allow people to access and coordinate their lifelong health information and make relevant pieces of it available to those who need it." However, an individual may still keep a paper record. Patients can access, reconcile, update, and exchange pharmaceutical information with their physician from a variety of sources [36].

Preserving the five rights of drug delivery is one strategy for preventing pharmaceutical errors. Observe the proper procedures for medication reconciliation. Check processes two or even three times. Ask the doctor or another nurse to read it over again.

CONCLUSION:

Medication mistakes are very common in rural India. One of the primary reasons for this is the lack of a clinical pharmacist in the scenario. Furthermore, patient counseling and medication counseling are not offered, thus patients getting drugs do not achieve the anticipated results, have unwanted effects, and exhibit noncompliance. Another factor contributing to pharmaceutical errors is a lack of qualified and skilled workers. A clinical pharmacist must keep up to speed on the pharmaceuticals accessible in the hospital and avoid any potential contraindications or side effects. Instead of blaming each other for who made the mistake, the healthcare system must build a method to document and prevent them in the future.

Conflict of Interest: The authors declare no conflict of interest.

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