E ISSN 2350-0204

IJAPC

VOLUME 11 ISSUE 3 2019

www.ijapc.com
Greentree Group Publishers (GGP))

Int J Ayu Pharm Chem

RESEARCH ARTICLE

www.ijapc.com

e-ISSN 2350-0204

Artificial Intelligence in Medication Error

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ABSTRACT

In pharmacy practice there are numbers of medication error occur. This research work what is the percentage ratio of medication error by a Medical Practioner, Pharmacist and Nurses in Anand district. Personal communication was held with the aid of a questionnaire to take review of research from different health practitioners. For minimizing the same the article shows us of theoretical based artificial intelligence software strategy.

KEYWORDS

Medication Error, Artificial Intelligence, Software Strategy, Patient Current Therapy, Statistical Analysis.

Greentree Group Publishers

Received 23/08/19 Accepted 23/10/19 Published 10/11/19

INTRODUCTION

The National Coordinating Council For Medication Error Reporting And Prevention (NCCMERP) has defined medication error as "any avertable 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 and consumer"[1]. Medication errors can occur from prescribing to the administration of the drug. In US 7000 deaths have been reported in hospitals per year due to medication error and 5.2 million injuries have been reported each year due to medication errors in India[2]. This study aims to determine percentage of medication errors occur by Doctor, pharmacist and nurses. The study was conducted in the ICU and medicine wards at a tertiary care hospital of India in Gujarat state in Anand district. Research methodology involves questionnaire and verbal communication with health practitioners like Doctor, pharmacist and nurses to gathering data. Research show statistical graphical representation on medication error. This article provides solution to overcome this medication error with using artificial intelligence. It is development of computer based systems able to perform human tasks normally requiring human intelligence. System involves cross check of barcode system. It is check whether right treatment given to right patients with right medicines or not. This artificial system is developed recording software to maintain all past and current medical data and treatment details with future threats. Research study only gives theoretical abased software strategy to minimize the medication error.

AIMS AND OBJECTIVES

1. Find out percentage of medication error that arise due to Doctor, pharmacist and nurses in Anand District.

2. To develop theoretical software strategy for reducing medication error that usually occurs by Doctor, Pharmacists and Nurses

3. Find out which stages of treatment have a highest chance of medication error by Doctor, Pharmacist and Nurses.

MATERIALS AND METHODS

Research involved questionnaire as a material. Method involved descriptive statistical analysis to conclude this research work. This analysis method helped to identify maximum percentage of medication error by Doctors, Pharmacists and Nurses in target place.

- ✓ Target place: Anand district
- ✓ Target people: Doctor, Nurse &

Pharmacist

- ✓ Total number of doctor:30
- ✓ Total number of patients: 30
- ✓ Total number of pharmacist :30

To reduce medication errors theoretical software strategy is developed that is shown in following table.

Table 1 Theoretical Artificial Intelligence Software Strategy to Record Data

Patient Past record			**Current Therapy**			
Patient Personal Details: Name: Age: Gender: Address: DOB: City: State: Phone No:	Past Record of Disease Past Diseases: Past Medications : Duration Of Treatment : Consulting Physician: Name: Designation: Contact Details: Patient Family Medical History:	Hospital Details: Name: Contact Details: Patient ID: Ward No.: Bed No.:	Patient Personal Details: Name: Age: Gender: Address: DOB: City: State: Phone No.:	Present Disease: Present Medications: Duration of Treatment: Consulting Physician: Name: Designation: Contact Details: Patient Family Medical History:	Hospital Details: Name: Contact Details: Patient ID: Ward No.: Bed No.:	Medications: Name Of Drug: No. Of Drug: How to take: When to take: Route of Administration: Specific Instructions: Adverse Effects Of Drug:

Every patient has a barcode band strip on hand. Same barcode will be given to patient's physician, pharmacist and nurse. So, at every stage of treatment all health practitioners can easily cross verify all the data of the patient as it is on display of software machine. There were different barcode color as per category of patient like for pediatric patient, geriatric patient , adult patient , pregnant patient, lactating woman by green, red, orange, yellow and white barcode strip band, respectively. During any stage of treatment if data is not matched by tracker of barcode then system will give "RED MARK" and at the same time medication error is removed by Doctors, Pharmacists and Nurses. Therapy is only started after system will show "GREEN MARK" on display screen of machine.

RESULT AND DISCUSSION

Using questionnaire research the results of the study are given in following table 2.

Table 2 % Error of Doctors, Nurses and Pharmacists

Doctor error:	Nurses error:	Pharmacist error:
Under dose-77%	Wrong patient-90%	Wrong medication-87%
Over dose-63%	Wrong route-83%	Wrong quantity-77%
Incorrect drug-47%	Wrong time of administration-77%	Excessive dose-70%
Wrong monitoring-13%	Medication omitted-80%	Alternate medication-67%
Drug drug interaction-7%	Wrong drug treatment-43%	Wrong direction-67%
	Wrong rate-67%	Wrong formulation-60%

The statistical results from the questionnaire research is shown individually for the doctors, pharmacists and nurses in Figure 1, 2 and 3.

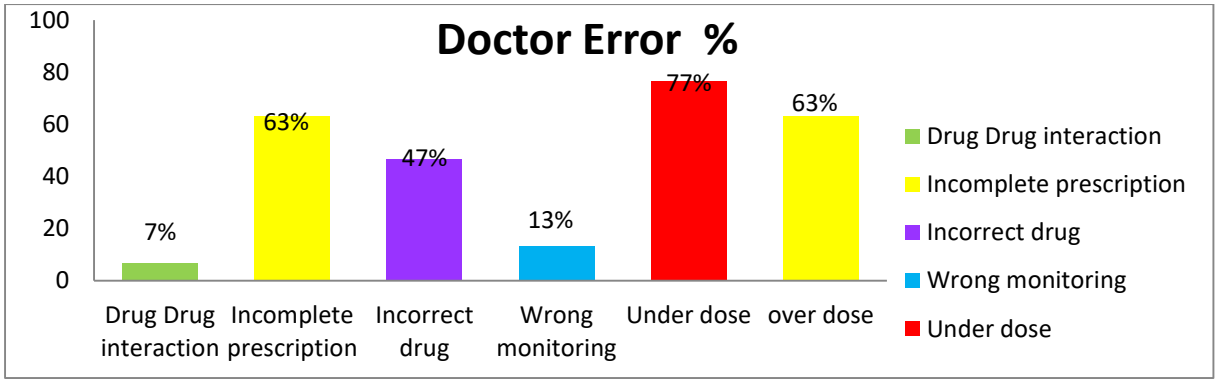

Figure 1 Doctor Error %

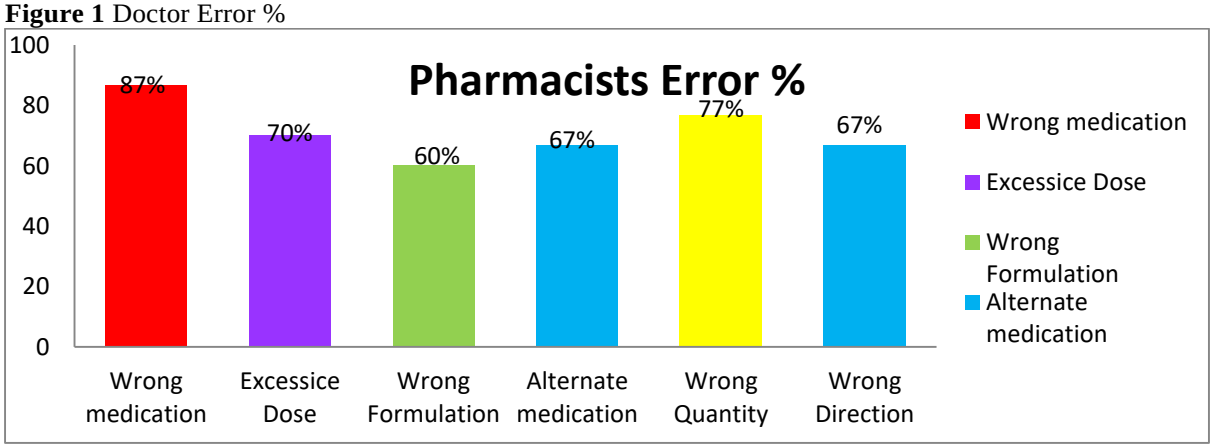

Figure 2 Pharmacist error %

CONCLUSION

In Anand district research found that average medication error was 41%, 71% and 73% by doctors, pharmacists and nurses respectively. Highest error by the doctor in evaluating parameter of under dose (77%), Highest error by the pharmacists in evaluating parameter of wrong medication (87%) and Highest error by the nurses in evaluating parameter of wrong patient (90%). Article suggests that all these errors can be removed by using artificial intelligence software. This software is cross verify the barcode of patient by the doctors, pharmacists and nurses during

the period of treatment. This software will help to easily identify the error at which stage of therapy and errors occurred by whom (i.e. by doctors, pharmacists or nurses). If wrong medication given to wrong patient than software will give red mark. Therapy only start after showing green mark. It is obtain after successful cross verification of patient barcode, medication barcode and inbuilt system barcode of patient. Research show that artificial intelligence system will successfully remove all above medication error.

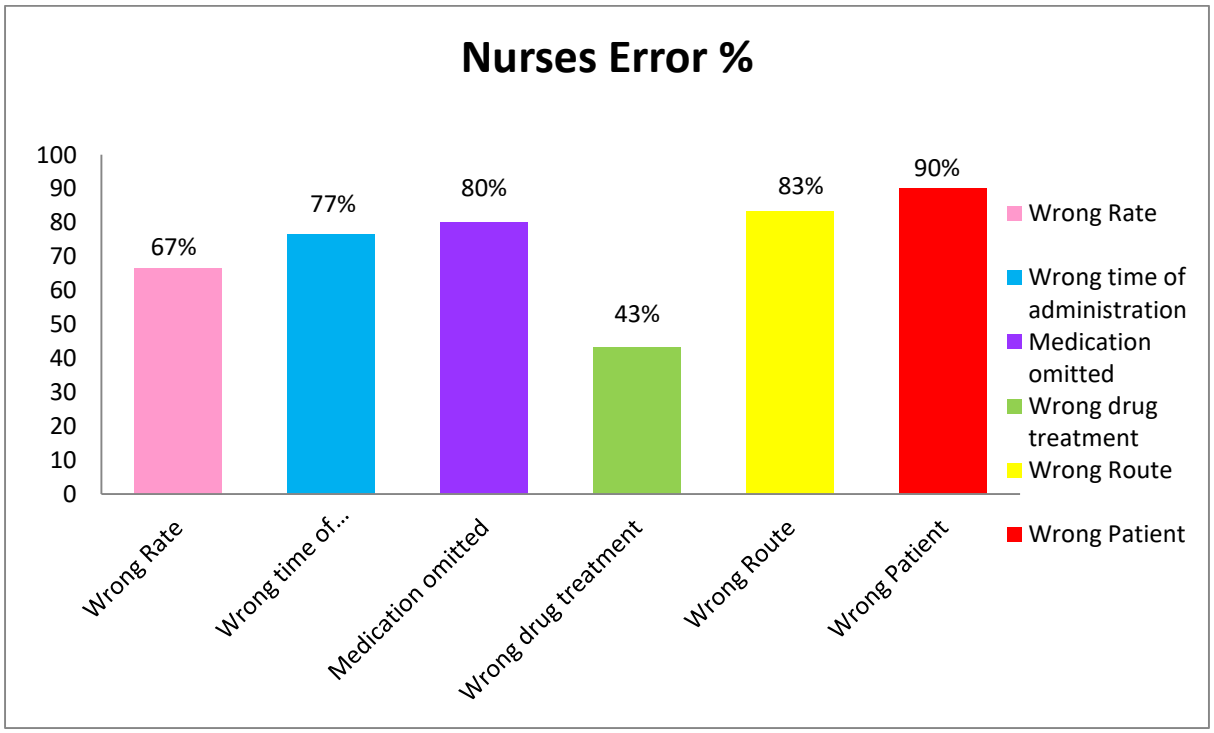

Figure 3 Nurses error %

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