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A study of prescription errors in South Indian City, Karnataka- An observational study

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ABSTRACT

Background: A prescription is a written order to provide instructions regarding patient medications by the physician. Prescription include directions for the pharmacist to dispense the medication, directions for the patient regarding administration of drugs. Patient demographics and prescriber details are the legal requirements of the prescription writing.
Materials and Methods: An observational study was conducted and data collection forms were used to collect the information from the patient. Confidentiality was maintained to secure the patient information, prescription details, throughout the study. All the prescriptions are analyzed for general details, medical components, and legal requirements. The data obtained were summed up and simple statistical analysis was performed to draw the results. All the prescriptions had general details mentioned in it.
Result: The mentioning of demographic details in prescription were found to be 48.07%.
The clarity of the prescription related to legibility of handwriting was achieved in 92.24%.
Poly-therapy was observed in 73 prescriptions. Most of the prescriptions did not provided description on the direction on usage of medications.
Conclusion: Our study highlights the need to train prescribing doctors on writing rational prescriptions for quality improvement.

1. Introduction

The prescription is a legal document comprising instructions for medication by the licensed medical practitioner to the pharmacist.[1] They are the written orders for drugs or non-drug products issued by a physician, dentist, or other properly licensed prescribers who have limited scopes of practices.

A prescription usually contains blank spaces for the essential and required information. These prescriptions should be legally containing the following information:

1. Information of the patient (e g, name, age, and home address).
2. Date on which prescription was written.
3. Rx symbol or superscription.
4. Name and strength of the drug or product (inscription) and quantity to be dispensed: this should contain the amount and units of measure (e.g., grams, ounces, or tablets).
5. Dispensing directions to pharmacist called superscription.
6. Directions for the patient or signa (to be placed on label

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7. Refill, special labeling, and or other instructions or information's.
8. Prescriber's information like name, signature, office address, telephone numbers and registration number.

Prescription should be written legibly in ink or otherwise to be indelible. A good prescribing does not has any globally accepted definition. The aims of the prescriber are:

1. Maximize effectiveness
2. Minimize risks
3. Minimize costs
4. Respect the patient's choices[2]

Community pharmacists are the primary contact person in the society and he / she play a major role in dispensing the medicines.[3] The prescription serves as a vehicle for communication from the prescriber to the pharmacist about the needs of the patient.[4]

The prescription errors are the type of medication errors and are defined as the 'incorrect and inappropriate drug selection for a patient.' The prescription errors are mainly of two type's- errors of omission and errors of commission. It is an avoidable form of medication error and it accounts for 70% of medication error.[1]

The error can be in the dose, frequency, indication, or prescribing of a contraindicated drug. Lack of knowledge about prescribed drug, its recommended dose, and of the patient details contribute to prescribing errors.[5] Some of the other contributing factors includes:

1. Illegible handwriting.
2. Inaccurate medication history taking.
3. Confusion with the drug name, dose, and frequency.
4. Inappropriate use of decimal points. A zero should precede a decimal point instead of only decimal point (e.g., 0.1). Similarly, tenfold errors in dose can occur as a result of zero following an illegible decimal point (e.g., 1.0).
5. Use of certain abbreviations (e.g., AZT has led to confusion between zidovudine and azathioprine).
6. Use of verbal orders.[6,7]

Prescribing errors can take many forms, but commonly involve incorrect doses, illegible details or ordering inappropriate medications or drugs that may react with other medications already being taken.[8] Inappropriate prescribing results in serious consequences such as wastage of public economy, increased risk of toxicity, adverse drug reactions.[1]

The prevalence of prescription error is common and is a major healthcare related problems, especially in developing countries.[9] Prescribing errors can lead to adverse events. The frequency of errors differ from based on type of patient, patient load, training. Studies shows atleast one prescription error in 15-21% of prescription.[10] The incidence of prescription error among inpatients is around 30%.[7] In pediatric was estimated to be 11.1-18%.[11] Pharmacist can prevent these errors by appropriate intervention.[12]

Risk factors for the development of prescribing errors was work environment, workload, whether prescribing for own patient, communication within the team, physical and mental well-being, and lack of knowledge were all identified. Organizational factors such as inadequate training, low perceived importance of prescribing, a hierarchical medical team, and an absence of self-awareness of errors also contributed to these errors.

A four-week United Kingdom (UK) prospective study of included 36,200 prescriptions, 1.5% had prescribing errors, 25% of which were potentially serious. When only serious errors were examined, 58% of the errors originated in the prescribing decision and 42% in medication order writing. The distribution was different in non-serious errors.

The rate of prescribing errors has been estimated to be 11% in primary care setting. Communication of prescribing information between primary and secondary care has also been shown to be less than ideal as evidenced by a study which estimated that 50% of patients were failed to take the correct medicine one month post discharge.[6]

Of further concern was the fact that many errors were made by relatively junior medical staff, who are responsible for most of the prescribing in hospitals. Medical graduates themselves feel unprepared to prescribe shortly after graduation, emphasizing the need to ensure sufficient education in prescribing skills. Dean et al. by using human error approach suggested that most mistakes were made as a result of slips in attention, or because prescribers did not apply relevant rules.

In the screening of prescriptions, the pharmacist plays a major role at the initial state to assess the errors found in it and to perform the intervention for the purpose of betterment of patient health.[1] The purpose of the study was to analyze the prescriptions for legal requirements according to standardized form and to evaluate the rate of frequency of prescription errors.

2. Materials and Methods

An observational, non-interventional study was conducted in Community Pharmacy located at Hassan city, Karnataka, India. Prescriptions were collected from the patients visiting the community Pharmacy. Complete confidentiality of patients was maintained throughout the research after taking informed written consent. The study was carried out over a period of 3 months in the community pharmacy setup, Hassan city, Karnataka.

All the prescriptions were analyzed on the following parameters:

1. General details (name, age, sex, OPD registration number, date of consultation, and legible handwriting).

2. Medical components (history, examination, definite diagnosis, investigations, correct dose and dosage, duration, of treatment, follow-up advice, referral details, do's and don'ts, legible signature and medical council registration number).

2.1. Method of audit

Factors of audit for Standard format of the prescription was collected

1. Patient identity: Name, age sex and address of the patient
2. Prescription written date
3. Superscription symbol: Rx meaning "take thou" or "recipe "
4. Inscription: which includes the name of drugs, dose, dosage forms, and total amount of medication prescribed.
5. Subscription: the dispensing and compounding instructions to the pharmacist as regards to form and quantities to be dispensed or supplied.
6. Transcription or Signa: the direction to the patient for use of drugs
7. Prescriber's identity: Name, qualification, registration number, address, and signature *

2.2. Inclusion criteria

Prescriptions received by the Community Pharmacy were included in this study.

2.3. Exclusion criteria

Patient came to Community Pharmacy without prescription and dispensed medicines.

2.4. Source of data

Information collected from patient prescriptions.

The legal requirement in the prescription was collected. Informed Consent Form (ICF) was designed and consent received from the Community Pharmacist after explaining of his involvement in this study. The collected and assessed prescriptions data were entered into the book for the future reference. A computerized data base was created using Microsoft Excel Software and descriptive methods were used

3. Result

A total of 156 prescriptions were collected randomly and subjected for the analysis. The analysis of the prescription errors is performed based on standard format.

The collected prescription were screened for the presence of demographic details such as patient name, age, gender and their address. Among the included prescription 15.39% of prescription had patient name while 83.98% of prescription didn't mentioned patient name. Age and address of the patient was ignored in much of the prescription, where only 14 prescription and only 12 prescription contained patient address. The frequency of presence of demographic details is shown in Table 1.

Table 1: Assessment ofdemographic details

Demographic Details (Total 156)	Present	Absent
Name	24 (15.39%)	132 (84.61%)
Age	14 (8.97%)	142 (91.03%)
Gender	25 (16.02%)	131 (83.98%)
Patient Address	12 (7.69%)	144 (92.31%)

Prescription screened for prescriber details revealed that 77.57 % of prescription did not contain prescriber details. The collected prescription was also checked for the prescriber's registration number and address. Registration Number and Prescribing Address was present in 38 prescriptions and were absent in 118 (75.65%) prescriptions. Around 69.24% of prescription was lacked with prescriber's signature. The symbol Rx was mentioned in 49 (31.41%) prescriptions and was absent in 107 (68.59%) prescriptions.

Frequency of prescribing details shown in Table 2.

Table 2: Assessment ofprescribing details

Prescribing Details (Total 156)	Present	Absent
Date	35 (22.43%)	121 (77.57%)
Prescriber Name	35 (22.43%)	121 (77.57%)
Registration Number	38 (24.35%)	118 (75.65%)
Prescribing Address	38 (24.35%)	118 (75.65%)
Signature of Prescriber	48 (30.76%)	108 (69.24%)
Rx	49 (31.41%)	107 (68.59%)

The prescription analysis shows that all drugs were prescribed in brand name rather than generic name. The clarity of the prescription related to legible handwriting was achieved in 94.24% whereas 5.76% of prescription contained illegible hand writing. Most of the prescription did not provided description on the direction of usage of medication.

Prescribed drugs related factors shown in Table 3.

Table 3: Prescribeddrugs related factors

Drugs Related	Present	Absent
Brand Name	156(100%)	00(0.00%)
Generic Name	0(0.00&)	156(100%)
Able to understand writing	147(94.24%)	9(5.76%)
Directions for use	1(0.64%)	155(99.36%)
Polytherapy	73(46.80%)	83(53.20%)

Polytherapy was observed in 73 (46.80%) prescriptions among which 33 (21.15%) had 2 drugs, 22 (14.10%) prescriptions had 3 drugs and 18 (11.55%) prescriptions had 4 or above 4 drugs. Monotherapy was observed in 85 (53.20%) prescriptions.Table 4

Table 4: Distribution based on polytherapy

Number of drugs	Number of Prescriptions
1 drug	83 (53.20%)
2 drugs	33 (21.15%)
3 drugs	22 (14.10%)
4 and above 4 drugs	18 (11.55%)

4. Discussion

Prescription is an important intervention by the physician, and it is the ethical and legal duty of the practitioner to write complete and legible prescriptions.It is important to mention, the correct patient details to ensure the patient receives the correct treatment for his/her diagnosis.[13] Among 156 prescriptions, only 12 prescriptions complied with all the legal requirements according to the standard prescription which alarms for the need of completeness of prescriptions at developing cities.

Prescriber's information on prescription is necessary as it helps the dispensing pharmacist to contact prescriber in the case, if any clarification regarding prescribed drugs is needed[16]. In our study, it was found that prescriber name was present in 22.43% of prescriptions. Registration number of prescriber and their address was found in 24.35% and 48 prescriptions had prescriber's signature which may lead to inconvenience for the dispensing pharmacist especially for the dispensing of psychotropic or related drugs.

A study conducted by Saleem R et al. reveals that prescriber's name and signature were present in 18.6% and 94.7% prescriptions respectively.[14] Vaishali D et al. reveals that 78.2% and 89.6% of prescriptions were deficient in prescriber's address and telephone number respectively.[15] But a contrast result of 16.7% and 18.1% prescriptions lacking with prescriber's name and signature respectively were revealed by Irshad Y M et al.[16]

A study conducted by Tulika Singh determined a total of 85.8% of drugs were prescribed by generic name. Most of the drugs are available in variable strengths and dosages forms and thus it poses problems for dispensing.[13] In our study, 156 prescriptions were prescribed with brand names in contrast Saleem R et al. study reports that 78.2%, 8.8% and 6.8% prescriptions contained brand, generic, and mixed (generic and brand) names of drugs respectively[14] and Anuja A et al. reveals that 7.4% of pediatric prescriptions had generic names.[17]

However, prescriptions written by generic names is beneficial in the sense that dispensing pharmacist can dispense the most economical and efficacious brands to patients. Nonetheless, 6.2% of prescriptions were not readable;[14–17] this report was like our study where, 5.76% prescriptions were not readable easily.

According to a program of research aimed to explore the causes of prescribing errors made by first year foundation trainee (FY1) doctors, 11,077 errors were detected in 124,260 medication orders checked on seven 'census days' in 19 acute hospital trusts in North-west England, a mean error rate of 8.9 errors per 100 medication orders.[18] Therefore, regardless of prescriber, completeness of the prescription serves in appropriate screening of prescription, ensuring safety and dispensing of medication by pharmacist.

Researchers has proposed different strategies for improving prescription writing. An intervention study in a Dutch intensive care unit reported to reduce prescribing errors, when onward pharmacists were participated.[14,19] Other researchers suggested for using electronic prescribing systems to reduce the errors[14,20,21] It is demonstrated that an elegant and clear prescription can cut transaction errors by 84% and save more than 2.5 million dollars in adverse drug reaction.[22]

5. Conclusion

In the successful analysis prescription and dispensing by the pharmacist necessitates completeness of prescription. The study reveals that, there is lesser compliance rate in adhering to the legal prescription writing. Lack of demographic details of the patient and information of the prescriber leads to confusion of the dispenser. Patient demographic helps the pharmacist in effective screening of prescription and avoidance of medication error. Prescriber's details, which is neglected in the prescription is extremely important in various cases such as clarification regarding medication information, restricted prescription. Adherence to legal prescription writing is essential for the effective patient care.

There is a need of error reduction strategies which are implemented through educational programs and continuous professional development programs to the prescribers for the awareness. The government has to work on the implementation of generic medicine awareness, essential medicine promotion and utilization for easy access to cost effective medicine.

6. Source of Funding

None.

7. Conflict of Interest

None.

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