

Assessment of Nonconformity to Prescription Writing Requirements and Prescription Errors: A Community Based Study

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ABSTRACT

Background: Drug therapy may not be successful if the process of writing prescription, dispensing and administration is not appropriately performed resulting into medication errors, which are unfortunately a reality in most health care settings. Approximately 30% of problems occurring during hospitalization are related to medication errors, causing great economic impact, serious morbidity and mortality. So it was thought of interest to study non compliance with prescription writing requirements and prescription errors in a community based setting. **Methodology:** The study was conducted in the community pharmacies for over a period of two months. The new prescriptions were screened prospectively to assess non compliance for one or more of the legal or the procedural requirements of prescription writing and was recorded in a standard data collection form. **Result:** Of the 1488 prescriptions screened during the study, 98.7% had one or more of the legal or procedural requirements missing. These errors of omission are patient's age, gender, weight, dose, frequency, course prescribed. Errors of commission involved related to dosage form 4.91% and Polypharmacy 58%. These errors occurred in considerable number regarding important variables involving all health care professionals working in patient care. **Conclusion:** The study shows a low compliance to the legal and procedural requirements for prescription writing and denotes significant scope to educate and emphasize the importance of writing clear and complete prescriptions to avoid medication related injuries, thus evidencing the need of constant evaluation of these events in order to prevent them and assure greater safety and success in the therapy.

Keywords: Prescription Error, Polypharmacy, Medication error, Prescription.

INTRODUCTION

Almost everyone in the modern world takes medication at one time or another. Most of the time these medications are beneficial, or at least they cause no harm, but on occasion they do injure the person taking them.¹ The Adverse Drug Event (ADEs) and medication errors are most common types of injuries experienced by hospitalized patients.

A medication error is 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 Medication errors are a serious public health problem and have received a great deal of attention in recent years, harming at least 1.5 million people every year.² Their effects can range from small injuries to the patient's death and these errors can occur at any stage of the medication system.³ Medication errors are one of the most common patient safety issues and

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prescribing errors are one of the most common types of medication errors.⁴ The medication system starts with the prescription. A prescription is 'a written order, which includes detailed instructions of what medicine should be given, to whom, in what formulation and dose, by what route, when, how frequently, and for how long.'⁵

The art of prescription writing is an ancient inheritance and is one of the most important therapeutic transactions between health care professional and patient. Its importance through the centuries, has made it one of the most significant written communications of the human race. The ancient symbol, Rx, established centuries ago and has been carried down to the present time. A prescription is an instruction from a prescriber to a dispenser. The prescriber is not always a doctor but can also be a paramedical worker, such as a medical assistant, a midwife. The dispenser is not always a pharmacist, but can be a pharmacy technician, an assistant or a nurse. Accurate diagnosis; proper selection of medication, dosage form and route of administration; proper size and timing of dose; precise dispensing; accurate labeling; and correct packaging all must be provided for complete understanding and accuracy to avoid undesirable and/or serious effects on the patient.⁶

There is no global standard for prescription, every country has its own standards for the minimum information required for a prescription, and its own laws and regulations to define which drugs require a prescription and who is entitled to write it. The most important requirement is that the prescription should be clear, legible and indicate precisely what should be given and should precisely identify the receiver. Health care professional owed a duty of care to a patient and are legally obliged to write a prescription clearly and with sufficient legibility for the rightly identified and to the intended patient or receiver to avoid for possible mistakes by a busy pharmacist. Some time illegible handwriting results in a breach of that duty, causing personal injury but liability does not end when the prescription leaves the doctor's

consulting room, it may also be a cause of the negligence to others. Doctor's negligence may contribute to the negligence of the pharmacist, although the greater proportion of the responsibility lay with the pharmacist himself.^{6,7}

Form of the Written Prescription

A prescription, consists of the superscription, the inscription, the subscription, the signa, and name of the prescriber (Table 1) - written within the confines of a form. Information on a prescription complying with the following minimum information can help prevent medication errors arising out of inappropriate prescription writing practices and should include:

- Name, address, contact of Prescriber
- Date
- Propriety name along with Generic name of the drug, strength,
- Dosage form, total amount
- Name address age of patient (especially in case of pediatric and geriatric)
- Signature or initials of prescriber^{6,7}

The 'normal features' of prescription writing include the identity of the recipient, the identity of the drug, the formulation and dose, and the route, timing, frequency and duration of administration (although this list is by no means exhaustive). Any wrong instruction or missing information about one or more of the normal features of a prescription will result in prescription error.⁸

These prescription deficiencies form a large proportion of errors which is mainly due to the attitude of some prescribers who are always in hurry and unwilling to spend a little more time in writing clear and complete prescription.⁹ Any flaw at this stage can directly or indirectly lead to problems in subsequent stages, increase medication error statistics and affect patient safety.³

Errors in prescribing may be classified as errors of omission and errors of commission. Errors of omission are where a prescription is incomplete in some way

Table 1: Components of Prescription

Form	Description
Superscription	The date when the prescription order is written; the name, address and age of the patient; and the symbol Rx (an abbreviation for "recipe," the Latin for "take thou.")
Inscription	The body of the prescription, containing the name and amount or strength of each ingredient.
Subscription	The directions to the pharmacist, usually consisting of a short sentence such as: "make a solution," "mix and place into 10 capsules," or "dispense 10 tablets."
Signatura	From the Latin "signa," meaning "write," "make," or "label," this sections contains the directions to the patient

like absence or incomplete specification of dosage form or strength, dose or dosage regimen, quantity or duration of drug to be supplied as well as prescriptions that are illegible and prescriptions that violate legal requirements, whereas error of commission contain incorrect information like wrong dose or dosage regimen, wrong drug or its indication, wrong quantity or duration of therapy, incorrect patient's name on the prescription, duplicate therapy and drug-drug interactions.⁹ Such mistakes could cause serious problems for the ultimate success of treatment or even patients health. In some other cases these problems could lead to drug overdose, toxicity or even occurrence of fatal drug interactions, especially in the elderly patients.¹⁰

The scope and severity of medication errors and the related consequences have been documented by many health researchers.^{11,12} Medication error can be recognized and used to help prevent future errors. Investigations of medication errors have contributed to reducing the rate of their incidence. The aim of present study is to assess the extent of noncompliance with prescription writing requirements and related prescription errors.

METHODOLOGY

This study was conducted in the three selected community pharmacies at Bijapur city for over a period of two months. Averages of 30 prescriptions per day were monitored by final year B Pharm students. The new

prescriptions were screened prospectively and analyzed for noncompliance to prescription writing requirement. Any prescription that did not comply with one or more of the legal or the procedural requirements would be considered as noncompliance and recorded in a standard data collection form. These were mainly errors of omission and errors of commission which are expressed in percentage.

RESULTS

A total of 1488 new prescriptions (Table 2) were screened. Of these 1468 (98.7%) prescriptions had one or more of the legal or procedural requirements missing. Out of these 1468 prescriptions, errors of omission include; 790 (53.79%) prescriptions without the patient's Age which is one of the most commonly omitted information, 790 (53.79%) prescriptions were without gender, 1444 (98.39%) prescriptions were without weight, while in 158 (10.75%) prescription date was not documented and total 414 (28.23%) prescriptions were without prescribed course. And errors of commission include wrong dose in 212 (14.45%) prescriptions, 603 (41.13%) prescriptions were with inappropriate administering frequency, 72 (4.91%) prescriptions were having wrong dosage form and total of 851 (58%) prescriptions were identified with Polypharmacy (Figure 1).

Table 2: Distribution of Prescription Nonconformity Errors (n= 1488)

Types of Error	Prescription components	Incidence observed (in no.)	%
Related to Omission	Age	790	53.79
	Gender	790	53.79
	weight	1444	98.39
	Date	158	10.75
	Course prescribed	414	28.23
Related to Commission	Inappropriate Dose	212	14.45
	Inappropriate Admin frequency	603	41.13
	Inappropriate Dosage form	72	04.91
	Polypharmacy	851	58.00

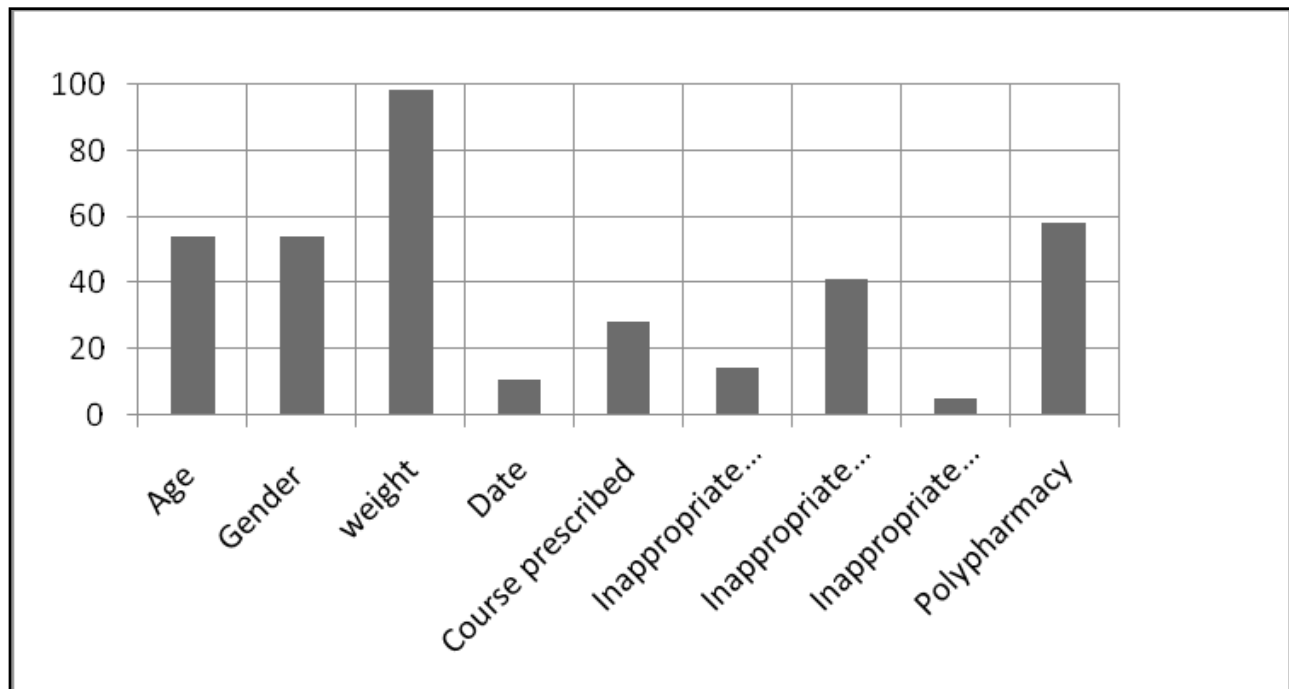


Figure 1: Distribution of Nonconformity (%) to Prescription Writing Requirements

DISCUSSION

In the community setting, the study showed that the prescription errors were being the second cause of medication errors after the patient errors¹². Some of the most frequent errors showed absent information in the prescription, such as age, gender and prescribed course and wrong information such as dose, administering frequency and Polypharmacy. Out of 1488 prescription screened, only 20 prescriptions complied with all the legal and procedural requirements. Total 53.79% of prescriptions were not having age, which is very important in terms of dose and dosage form especially in pediatric and geriatric population.

In country like UK the inclusion of age is a legal requirement in the case of prescription-only medicines for children under 12 years, the age of children under 5 years should be printed in years and months and of adults over 60 years must be printed on the prescription. Children, and particularly neonates, differ from adults in their response to drugs. Special care is needed in ensuring the drug prescribed is appropriate and that the correct dosage is given, it is particularly important to state the strengths of capsules or tablets.

A patient's weight is important information because it is often used to calculate the appropriate medication dose. When medication errors arise due to inaccurate or unknown patient weights, the dose of a prescribed medication could be significantly different from what is appropriate. Body-weight may be used to calculate

doses expressed in mg/kg. Young children may require a higher dose per kg than adults because of their higher metabolic rates. Children's doses may be calculated from adult doses by using age, body-weight, or body-surface area, or by a combination of these factors.¹³

A total of 53.79% of prescriptions were not having the information on gender. The gender has a great impact on the medication. For example, some medications react more fast or better with female than male. Also, gender play important role in prescribing medication for patients groups like pregnant women, woman of child-bearing age or any man trying to father a child should be cautiously prescribed and signed.¹³

The date of prescription is essential part of record. Around 10.75% of prescriptions were not having date. In case a patient suffers from an adverse reaction or the therapy is not being effective, the date could indicate when the patient started the therapy. About 28.23% prescriptions were without the prescribed duration of treatment/length of therapy. Duration of treatment helps to reach the target and prevent adverse effects.

The relationship between prescribed drug therapy and patient medication compliance is very important as it the single most important criteria which determines treatment outcomes. Missing or unclear instructions regarding prescribed course duration of medication in the prescription is of significant value in 1] chronic diseases states like Hypertension, Diabetes, TB, HIV, HRT where continuous therapy required for long term treatment goals 2] In case of antimicrobial usage where

repeated and improper or over use of prescribed antimicrobial is the primary cause of the increase in the number of drug-resistant microbes and decreased efficacy 3] In case of paediatric/geriatric and pregnant/lactating patient population where drug related needs and wants are quite different 4] In case of patient with renal or hepatic insufficiency, it may influence clinical management and may sustain significant risks by misunderstanding the recommended treatment regimens. Thus prescription information related to prescribed course of therapy is vital component in optimizing clinical outcomes.

Omissions of medication administration like before the meals or after the meals, in the morning or with lunch, or before the bed details are reported to be potential to cause harm to the patient¹⁴ and will result in failure of planned action to be completed as intended. Errors of commission represent a greater threat to the patient's health than errors of omission, if it is not identified and corrected. Prescriptions with wrong doses are among the most frequent errors mentioned. A total of 14.45% prescriptions were with wrong dose. If the strength of a drug required is written wrongly, it may lead to more serious consequences. For example: adult dosage to paediatric or geriatric patients. Around 41.13% prescriptions were with inappropriate administering frequency, such as prescribing medication without predefined time interval and duration of medication. A Total of 4.91% prescriptions were having wrong dosage form. It occurs when different dosage form is prescribed. Appropriateness of prescribed dosage forms are essential to achieve desired therapeutic response, which can be identified by assessing patient drug related needs and its provision through justified dosage form, this type of error could be easily identified and rectified. Use of the least number of drugs to obtain the best possible effect in the shortest period and at a reasonable cost is the rational drug prescribing.¹⁵ Polypharmacy has been recognized as an increasingly serious problem in current health care system and is commonly defined as the use of multiple medications or the use of a medication that is not indicated.¹⁶ This usually occurs with older people who have concurrent disease processes, each needing a specific treatment regime, and in the course receive more prescriptions per head than any other group, which can cause secondary morbidity from unnecessary or inappropriate medicines and drug incompatibility and/or age-related physiological changes that alter the ways in which drugs are handled by the body. Polypharmacy can predispose to the occurrence of adverse drug reaction and medication errors.¹⁷ Such types of commission errors will result in wrong plan to achieve an aim. Occurrence of these types of errors in prescriptions

could clearly affect the process of treatment or even cause serious or fatal problems for the health of patient. Hence, the important role of pharmacists in detecting and correcting these problems is quite clear.¹⁰

Recommendations to Reduce Prescription Errors:^{4,18}

Recommendations for Prescriber

Drug orders should be complete. They should include patient name, generic drug name, trademarked name (if a specific product is required), route and site of administration, dosage form, dose, strength, quantity, frequency of administration, and prescriber's name. In some cases, a dilution, rate, and time of administration should be specified. The desired therapeutic outcome for each drug should be expressed when the drug is prescribed. Prescribers should review all drug orders for accuracy and legibility immediately after they have prescribed them.

Care should be taken to ensure that the intent of medication orders is clear and unambiguous. Prescribers should

- Write out instructions rather than using nonstandard or ambiguous abbreviations. For example, write "daily" rather than "q.d.," which could be misinterpreted as q.i.d. (causing a drug to be given four times a day instead of once) or as o.d. (for once a day).
- Do not use vague instructions, such as "take as directed," because specific instructions can help differentiate among intended drugs.
- Specify exact dosage strengths (such as milligrams) rather than dosage form units (such as one tablet or one vial). An exception would be combination drug products, for which the number of dosage form units should be specified.
- Prescribe by standard nomenclature, using the drug's generic name or trademarked name.
- Always use a leading zero before a decimal expression of less than one (e.g., 0.5 ml). Conversely, a terminal zero should never be used (e.g., 5.0 ml), since failure to see the decimal could result in a 10-fold overdose. When possible, avoid the use of decimals (e.g., prescribe 500 mg instead of 0.5 g).
- Spell out the word "units" (e.g., 10 units regular insulin) rather than writing "u," which could be misinterpreted as a zero.
- Written drug or prescription orders (including signatures) should be legible. Prescribers with poor handwriting should print or type medication or pre-

scription orders if direct order entry capabilities for computerized systems are unavailable. A handwritten order should be completely readable (not merely recognizable through familiarity).

Recommendations for Pharmacists

- Checking for errors as prescriptions are received at the pharmacy and contacting prescribers for clarification or amendment before filling prescriptions
- Pharmacists should never assume or guess the intent of confusing medication orders. If there are any questions, the prescriber should be contacted prior to dispensing.
- Pharmacists should make themselves available to prescribers and nurses to offer information and advice about therapeutic drug regimens and the correct use of medications.
- Pharmacists should dispense medications in ready-to-administer dosage forms whenever possible.

CONCLUSION

Correct prescription writing has a great influence on the fate of medicine therapy and health of the patients. The results of the present study showed a low compliance rate to the legal and procedural requirements in prescription writing. This indicates that there is a need to emphasize the importance of writing clear and complete prescriptions and the necessity of introduction of Medication error reduction programs to achieve improvement in patient care, to satisfy the demand for a quality health care system for a safe and effective drug use process. Prescribing errors associated with prescription are common and can be carefully monitored by at least two pharmacists to review every prescription before it goes out the door to ensure minimizing the risk of errors, though it is not a full proof way but pharmacists along with other health care professionals

should work closely together to prevent the potentially harmful consequences of prescriptions errors.

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