

Assessment of Out-Door Patients Prescriptions According to FDA Prescribing Pattern in Northern Region of Saudi Arabia

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Abstract: Objective: The present study was undertaken to emphasize on medication errors occurs due to prescription errors. Methodology: In this study we evaluated prescription pattern for completeness in 300 prescriptions of the outpatient department in primary care hospitals situated in the Northern region of Saudi Arabia and analyzed for completeness with respective to (a) Prescriber information (b) Patient information (c) Details of each medication prescribed d) Subjective assessment of legibility of handwriting in Grades (I, II and III) for all prescriptions e) Drug interactions for all readable prescriptions. Symbol Rx and patients name was written in all prescriptions while patient weight was not mentioned in any prescription. Results: Hospital name was mentioned in only 2 prescriptions. Medication prescribed like the strength of medication and frequency of administration was included in 73% and 97.33% prescriptions respectively. Route of administration mentioned in 18.33% prescriptions while instruction for use not mentioned in any of the prescriptions. Illegibility of handwriting was found Grade-I in 47, Grade-II in 154, Grade-III in 99 i.e. moderately legible, barely legible, not readable respectively. Drug interaction found in 12 (Minor: 08, Major: 04) prescriptions. Result reflect that prescription errors occurred frequently by physicians. Conclusion: It is essential to address this issue and certain steps are to be taken to strictly follow FDA guidelines for writing a prescription.

Keywords: Prescription analysis, Medication error, Drug Interactions, prescription error, Saudi Arabia

1. Introduction

A prescription is written order form from a prescriber to a dispenser. The prescription is not always prescribed by the physicians or doctors but some time also prescribed by paramedical staff, such as a medical assistant, a midwife or a nurse. Prescriptions can be also dispensed by pharmacy technician, an assistant or a nurse but chief pharmacist plays a main role. 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.

Prescriptions are known to be difficult to decipher and understood by a layman. Initially, even a pharmacist requires effort and it is only after the considerable experience that he can read the prescription.

As prescription writing is not merely putting a few drug names on a piece of paper, prescription writing is kind of science which can be achieved only after years of practice, hard work and sound knowledge of the medical and paramedical subjects. Unfortunately, prescription errors are very common to happen and accounts for 70% of medication errors that could results adversely to the patients ¹.

A medication error has been defined 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 healthcare professional, patient, or consumer” ². Medication errors are currently a worldwide public health issue ³ and it is one of the most serious prescription errors.

There are two possible reasons. During the busy schedule, physicians write prescriptions in scribbly and uses many contractions, sometimes coined by himself, which a pharmacist alone can decipher. Secondly, the use of Latin words in prescription, but Latin words are slowly disappearing from the medical field. Few Latin words and abbreviations have very descriptive and important meaning and physicians still use them frequently. Few years back, a prescription was a secret communication between the prescriber and the dispenser and unidentified for the patient. With the increasing awareness about drugs, no secrecy is now warranted. As such the patient has a right to know what medication has been prescribed and his interest is protected under the Consumer Protection Act.

Physician adherence to issue good quality prescriptions will surely lessen the errors and eventually improve patient care. Hence, we conducted this study with the following objectives.

- Investigate prescriptions of outpatient coming to hospital pharmacy for drug dispensing, prescribed in hospitals by physicians in the Northern region of Saudi Arabia for the essential parameters like Prescriber information Patient information, Details of each medication prescribed, Legibility of handwriting and prescribed drug study of prescriptions.
- Determine the trends in writing a prescription and study the consistency of prescriptions written by the various physicians.
- Analyze drug interactions in understandable (Handwriting) prescription

- Verify total percentage of prescription without any error and drug interaction (complete prescription).

2. Materials and Methods

This was a cross-sectional study conducted in a hospital pharmacy. We evaluated prescriptions of outpatients coming to hospital pharmacy for drug dispensing. Three hundred prescriptions written by physicians from various specialties were studied. Institutional Ethics Committee permission was not obtained as there is no invasive procedure was done on the patients. To avoid any preconceived notion prescribing doctors were not aware of the study is being done.

Errors in the prescription were evaluated. To analyze the prescription patterns a checklist of essential parameters according to FDA guidelines for prescription writing was made³. Parameters included in the study are (a) Prescriber information: Hospitals name, address, information about the department and unit, details about prescriber i.e. Hospital details, Department, Name of the prescriber, Designation, Signature of the physician, Superscription(Rx), Regd. No. (b) Patient information: Name, age, sex, weight, and address of the patient and date of issuing the prescription. (c) Details of each medication prescribed: Generic/Brand name, strength, and frequency of administration, quantity to be

dispensed, route, dosage form and instructions for use of the medication. Use of abbreviations if any was also noted. (d) Legibility of handwriting: In this, we analyzed legibility of physician's handwriting on the prescriptions on a subjective scale as Grade 1: Moderately legible, Grade 2: Barely legible, Grade 3: Illegible. (e) Prescribed drug study: Evaluation of drug interaction in readable prescriptions.

Prescriptions were carefully analyzed for above-mentioned parameters to know how many prescriptions prescribe by the physician are complete i.e. prescription which contains all above parameters and without any drug interaction

3. Results

Total 300 prescriptions were analyzed on which total of 667 drugs were prescribed with an average of 2.22 drugs per prescription. In this study following parameters were studied.

a. *Prescriber Information:* Hospitals name and was mentioned only on 2 prescriptions whereas, symbol R_x (superscription) was mentioned in all prescriptions. Out of 300 prescriptions only 163 prescriptions were signed by the physicians and only 140 prescriptions have mentioned physician Regd. No.

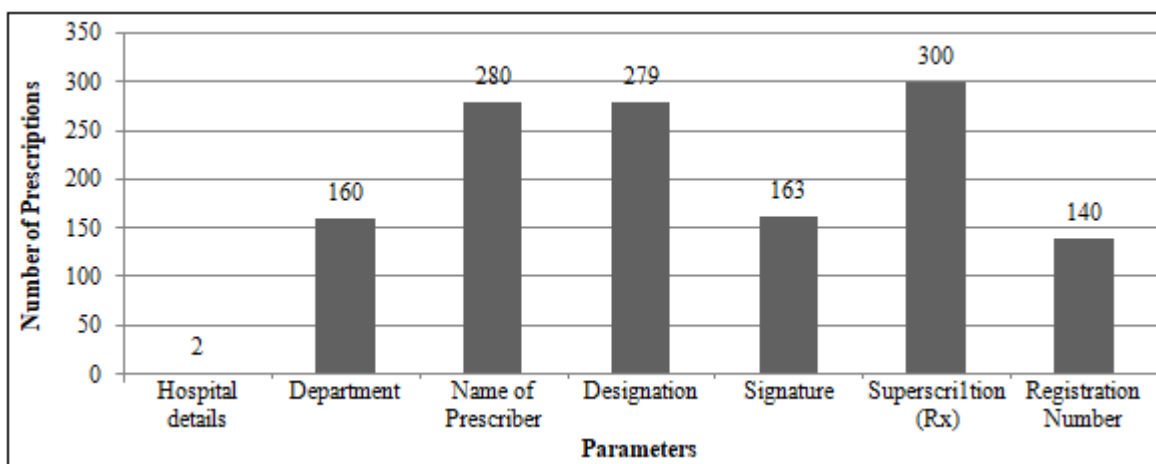


Figure 1: Prescriber Information

The values were calculated by analyzing 300 prescriptions and parameters were evaluated by considering these 300 prescriptions as percentage. Above graph has been drawn by using MS-excel 2007

b. *Patient Information:* Date of issuing was mentioned in 221 prescriptions but patient's body weight was not mentioned any prescription but patient name was mentioned in all prescriptions.

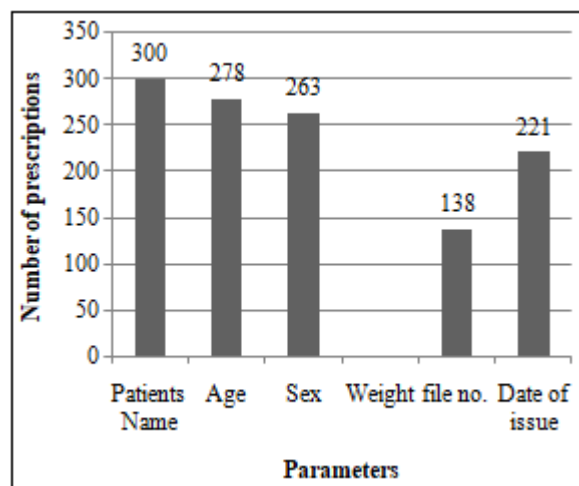


Figure 2: Adequacy of Patient Information

The values were calculated by analyzing 300 prescriptions and parameters were evaluated by considering these 300 prescriptions as percentage. Above graph has been drawn by using MS-excel 2007.

route of administration was mentioned only in 56 prescriptions. Strength of medication and the frequency of administration were mentioned in 219 and 292 of prescriptions respectively.

- c. *Details of each Medication Prescribed:* Instructions for use route was not mentioned in any prescription whereas

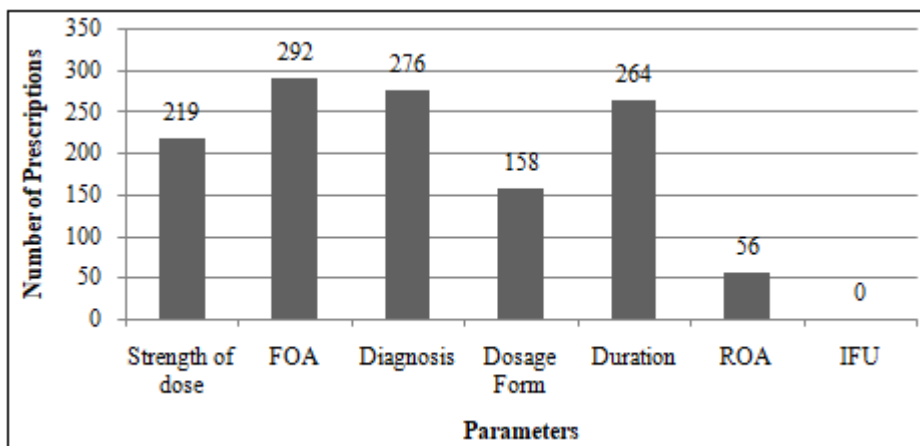


Figure 3: Details of each medication prescribed

The values were calculated by analyzing 300 prescriptions and parameters were evaluated by considering these 300 prescriptions as percentage. Above graph has been drawn by using MS-excel 2007.

- d. *Legibility of Handwriting:* 300 prescriptions were analyzed for their legibility of hand writing in three groups according to their readability. Fourteen prescriptions were in Grade 1 (Moderately Legible), 154 prescriptions were in Grade 2 (Barely Legible) but 99 prescriptions were in grade 3 (not readable) illegible.

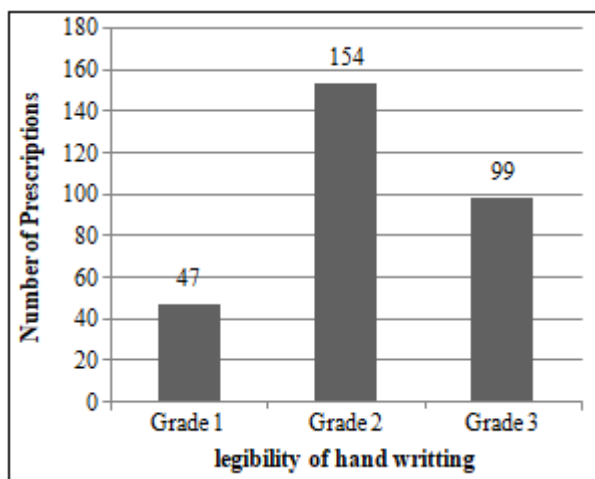


Figure 4: Legibility of hand writing

The values were calculated by analyzing 300 prescriptions and parameters were evaluated by considering these 100 prescriptions as percentage. Above graph has been drawn by using MS-excel 2007.

- e. *Number of drug Interactions:* All the study prescriptions were analyzed for possible drug interaction. Out of 300 prescriptions 12 prescriptions were revealed the possible drug interactions. Out of 12 prescriptions 4 prescription

have potential major drug interaction while 8 prescriptions have shown minor drug interactions.

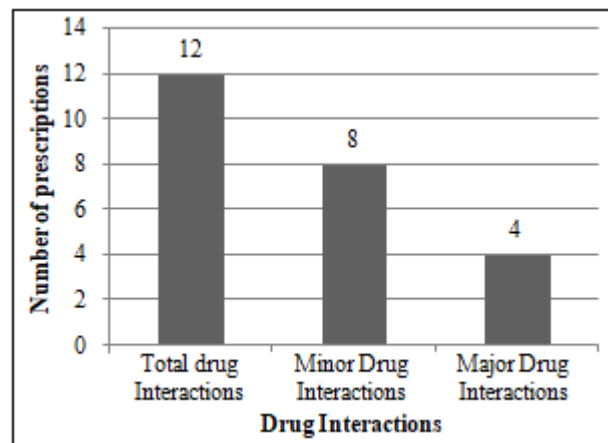


Figure 5: Number of Drug Interactions

The values were calculated by analyzing 300 prescriptions and parameters were evaluated by considering these 100 prescriptions as percentage. Above graph has been drawn by using MS-excel 2007.

4. Discussion

Prescription writing comprises (a) communication of prescription information, which denotes the act of transmitting prescription information e.g. drug name, dose, or dosage form etc., and (b) transcribing, which is the act of copying information in writing from one document to another. Transcripts should be distinguished from direct copies such as carbon copies, photocopies or printouts from computer files.

The present study was undertaken to review the pattern of prescriptions writing in a hospital situated in the Northern region of Saudi Arabia (hospital name is kept confidential)

and physicians were not aware of the study has been conducted. Data was collected from 300 prescriptions of patients coming at the hospital pharmacy.

The symbol Rx was mentioned in all prescriptions whereas hospital name and was mentioned only on 2 prescriptions, while signature was seen only on 163 (54.33%) prescriptions and registration number was missing in 53.34% of the prescriptions. Incomplete information about the prescriber could make difficult to recognize the person to ask about any doubt regarding the prescriptions, especially in poly-clinic where many resident doctors together.

Again in case of emergency drugs, this would become much critical and cause inconvenience to the patient involved (especially in case of psychotropic drugs). In the present study, 18.33% (58 prescriptions) prescriptions registration number was not specified. A registration number is provided by medical council of the individual country that gives authority to the physicians for the legal practice.

In the patient information section, the gender of the patient has not mentioned in 37 (12.34%) cases. It's critical while prescribing drugs such as hormones or contraceptives or some special medicines meant only for a male like drugs used for Begin Hypertrophy of Prostate (BHP), so gender should be mentioned to avoid errors while dispensing the drugs.

The weight of the patient was not mentioned in any of the prescriptions. In modern clinical practice dose of the drugs are tailored especially for the drugs which have narrow therapeutic index to avoid the toxic effects or no effect of the drugs. File number was mentioned only on 46% of the prescriptions, but file number is essential for record keeping for the pharmacist and clinicians to track the history of medications, drug allergy to the patients and also to trace the consumption of psychotropic and narcotic drugs. Date of issuing of prescription plays key role support to the pharmacist in recognizing potential problems. For example, when Codeine phosphate prescribed for dry cough and the same prescription is presented to a pharmacist after couple of weeks after the date of issue, the drug may no longer be indicated.

When physician prescribe any medicine it's very obvious to mention the dose but it is not a problem if the drug prescribed is available in single strength/dosage. However, now a day many drugs are available in various strengths and dosage forms so it's become essential to mention the dose of the drug⁴. At the same time, stating the frequency of administration and duration of use is also equally important especially in case of the antibiotics to avoid drug resistance and/or toxicity. In our study we found strength of the dose and frequency of administration was missing in 28% and 3% of the prescriptions respectively.

Oral route of administration generally mentioned in the prescription and even it's acceptable in few cases, but still some time the route might be misinterpreted by the patients. Surprisingly, route of administration mentioned only in 18.66% of the prescriptions. Instruction for use is not mentioned in any of the prescriptions as is very important

when an specific dosage intervals are needed (e.g. Insulin injection 20 min before meals, sleeping pills at bed time), it would likely benefit to patients. A Paracetamol suppository which is meant to administer by anal route but because of inadequate information on instructions for drug use may lead to decrease patient compliance.

Whether a prescription is legible or not depends on the assessor's familiarity with the handwriting of the prescriber as well as information provided in the prescription. Ideally, prescription should be easily readable by anyone involved in the dispensing activities. This is especially important since many drugs tend to have similar names such as Uloric (Allopurinol) and Ulotric (Duloxetine), Riscarb (Carbamazepine), or Ristab (Risperidone). This type of error may be reduced if the indication of the drug prescribed or the medical problem of the patient is also written in the prescription in readable hand writing. Therefore, all prescriptions should be clearly and adequately written and if possible printed to prevent such medication errors⁵⁻⁶.

The role that pharmacists play in the detection and correction of error needs to have greater recognition and to be formalized into a routine monitoring and feedback system. However, pharmacists are unable to prevent all errors due to time delays between prescribing and their seeing the drug chart, and because of limitations in the experience, knowledge, and workload of individual pharmacists. The study has limitation that only one pharmacy was included.

The growing use of pharmacological agents means that drug interactions are of increasing interest for public health⁷. Monitoring of potential drug interactions may improve the quality of drug prescribing and dispensing, and it might form a basis for education focused on appropriate prescribing.

Drug interaction should be consider while prescribing the drugs to the patients by physician, out of 300, 12 of the prescription revealed drug interaction among which 4 are categorized as major and 8 as minor drug interaction.

Minor drug interaction includes β -adrenergic blockers and NSAIDS may result in increased blood pressure (micromedexsolutions.com). One of the prescriptions contains NSAID and tricyclic antidepressants may result in an increased risk of bleeding⁸. Few of them contain same drug interaction which we found in various prescriptions where simvastatin and warfarin prescribed. Simvastatin and warfarin may result in increased risk of bleeding and an increased risk of rhabdomyolysis as simvastatin may reduce elimination of warfarin⁹. Drug interaction in between furosemide and hydralazine was observed as hydralazine may affect the furosemide kinetics¹⁰. Prescribing pairs of drugs with potential interactions increases the risk. As the number of drugs increasing in the prescription in the same proportion possibility of drug interactions as well so before prescribing any medicine one must consider about poly-pharmacy and drug interactions. It represent that physician should be careful while prescribing the drug to patient in order to avoid drug interactions. Many drug interactions are susceptible to control by dose adjustment; moreover, some are beneficial and are exploited in therapeutics.

It's essential here to mention that training activities has to be implemented, to improve the prescription behavior of practitioners. Interventions such as regular short problem based training courses workshop in pharmacotherapy should be made mandatory for practitioners. Regulatory guidance to develop prescription standards might be considered. Implementation of electronic computerized system of prescribing can be considered.

5. Conclusions

From observations and results it was clearly found that prescription writing errors occurred more frequently by the physicians and doctors in the Northern part of Saudi Arabia, this may contribute medical error which may be horrifying in many cases. Writing neat, correct and complete prescription as per the guidelines given by Directorate of Food And Drug Administration help patients for the consuming the right medicine at right time, right dose and right frequency with minimum risk of drug interactions.

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