

Original Article

## PREVALENCE AND NATURE OF HANDWRITTEN OUTPATIENTS PRESCRIPTION ERRORS IN BANGLADESH

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### ABSTRACT

**Objective:** The frequency of drug prescription errors is high in many countries of the world. The aim of the present study was to indicate the prevalence and nature of handwritten outpatient prescriptions errors collected from five different cities in Bangladesh.

**Methods:** The study was carried out using a standard structured questionnaire and analysis of prescriptions was done manually with the help of Microsoft office Excel-2007 following the Bangladesh National Formulary and standard treatment guidelines. A total of 900 prescriptions were collected from March 2013 to May 2013. The type of error of omissions considered in this analysis includes all three important parts of prescriptions, that is, superscription, inscription, and subscription. The analyzed data were then subjected to simple descriptive analyses including frequency distribution, mean and finally expressed in percentage.

**Results:** The most common type of superscription error of omissions was found to be gender (59.33%) and age (10.44%). The highest inscription error of omissions was missing the strength of medicine in 43.78% of total prescription following 37.56% of prescriptions were incomplete on direction for use, 16.44% of prescriptions were not having the information on dose and duration of therapy and 12.78% of prescriptions omitted the dosage forms of prescribed drugs. It was also found that more than 50% of prescriptions had illegible hand writing, 7.78% of prescriptions omitted the prescriber's signature and 23.78% of prescriptions omitted the date of prescription.

**Conclusion:** We conclude from this study that the handwritten prescriptions for outpatients were associated with significant frequency of minor and major prescription error of omissions. These serious prescription errors are the major cause of patient non-compliance, cost of therapy, drug adverse reactions and ultimately the patient morbidity and mortality. Therefore, the study suggests the prescriber's to be more professional, cared, focused and concentrated during writing prescription for the outpatients.

**Keywords:** Prescription, Outpatient, Prescription error, Bangladesh.

### INTRODUCTION

Bangladesh has achieved promising progress in the manufacturing of quality medicine after the promulgation of Drug (Control) Ordinance-1982. As a consequence, Bangladesh is now exporting their quality medicine to near about 80 foreign countries, but the total health care system in this country has not reached to the desirable stage. A lot of factors provoking the situation worsen day by day. One of the major causes is the prescription errors. A prescription drug order is a lawful written instruction from a licensed physician or other medical practitioner to a licensed pharmacist regarding the compounding or dispensing and administration of drug/s or other medical services to the patient [1]. Prescriptions comprise of four parts. The first one is the symbol for recipe that is found in the superscription, and then in the inscription specifies the ingredients and their quantities, the dosage form, dosage strength, and route of administration. The third part is named subscription in which is written the directions for compounding and in the last part which is usually preceded by sign are written the direction to be given and written on the dispensed medicine including how to take and how many and how long is the therapy [2]. Errors in prescribing may be classified into three main types: Errors of superscription, inscription, and subscription. Prescribing errors may have various detrimental consequences [3]. Hence, the components of a prescription should be clearly written, free of drug-related omission (incomplete prescription), commission (incorrect information), and integration errors, without nonofficial abbreviations, and fulfill the legal requirements of a prescription [4, 5].

The errors of prescribing are the commonest form of avoidable medication errors and are considered to be the most important target for improvement [6]. The process of prescription generation and dispensing is governed by regulatory systems, the purpose of

which is to maximize the safety and efficacy of the product supplied. Community pharmacists have an important role in checking prescriptions to ensure that they are appropriate to dispense [7]. Many studies had identified and documented problems associated with prescribing errors. The extent of such errors varied from 2.6% to 15.4%. Studies have shown that 15% to 21% of prescriptions contain at least one prescribing error [3]. Approximately 7.1% prescribing errors were detected during the study period of 1580 medication errors at teaching hospital in Saudi Arabia [8]. A study carried out in public teaching hospital in India has reported that 5% of prescriptions were incomplete [9]. However, 18.7% prescription errors were found in a study conducted at primary healthcare center in Riyadh city [10]. A study conducted in Indonesia by Perwitasari *et al.* reported a wide variation in error of omission from 0.44% to 98.69% [11].

Other studies show that pharmacists need to clarify prescriptions in 1% to 5% of prescriptions [5]. A survey conducted in prescription errors occurring in general practice concluded that the high rate of errors was mostly as a result of handwritten prescriptions [5]. As given evidence in a review of literature concludes that patient's outcomes can be improved due to the intervention of pharmacists [12]. Another study states that not only the pharmacist's role in dispensing process is vital, policies and procedures should exist to prevent errors [13]. Moreover, implementation of pharmacist intervention in the care of patient taking multiple medications can considerably reduce the cost, reduce adverse reactions and improve quality of life of the patient.

This study was designed to indicate the prevalence and nature of handwritten outpatient prescribing errors when information is omitted. It also emphasizes the necessity of interdisciplinary communication and cooperation in identifying and resolving

prescribing errors and irregularities in order to achieve optimal therapeutic outcomes for the patient [14,15, 16]. The literature review has shown no study being conducted to know about the epidemiology of prescription errors of omission for outpatients in Bangladesh. The present study may reveal the frequencies and nature of prescription errors of omission occurring in Bangladesh as well as steps to be taken to avoid these errors in better care and safety of patients.

## MATERIALS AND METHODS

### Collection of Prescriptions

Total 900 handwritten outpatient prescriptions from five different cities named Rajshahi, Jessore, Nagaon, Pabna and Chalna of Bangladesh were collected from March 2013 to May 2013. All prescriptions were included without exclusion criteria, being these prescriptions obtained from outpatient [17]. A written consent was taken from all the patients during the survey.

The survey was carried out with the close supervision of Pharmacist and chief investigator, Mohitosh Biswas following the section 12 of WMA declaration of Helsinki. This survey based research is also supported by the Department of Pharmacy, University of Rajshahi. The human subjects involved in this study did not use any hazardous agents and samples were not collected from them. As the human subjects only participated in the interview, this survey based research didn't take any further approval from institutional ethics committee.

In order to replicate normal bias working conditions as much as possible, prescribing doctors were not informed of the study. Three students of Master of Pharmacy (M.Pharm) from the Department of Pharmacy of Rajshahi University and four students of Bachelor of Pharmacy (B.Pharm) from the Department of Pharmacy of Jessore University of Science and Technology were selected for conducting the survey, who after receiving verbal instructions from the chief investigator, collected the data directly by interviewing the patients with a structured standard questionnaire.

The collected questionnaires were then analyzed manually with the help of Microsoft office Excel-2007 following the Bangladesh National Formulary and standard treatment guidelines. The data were then subjected to simple descriptive analyses including frequency distribution, mean and finally expressed in percentage.

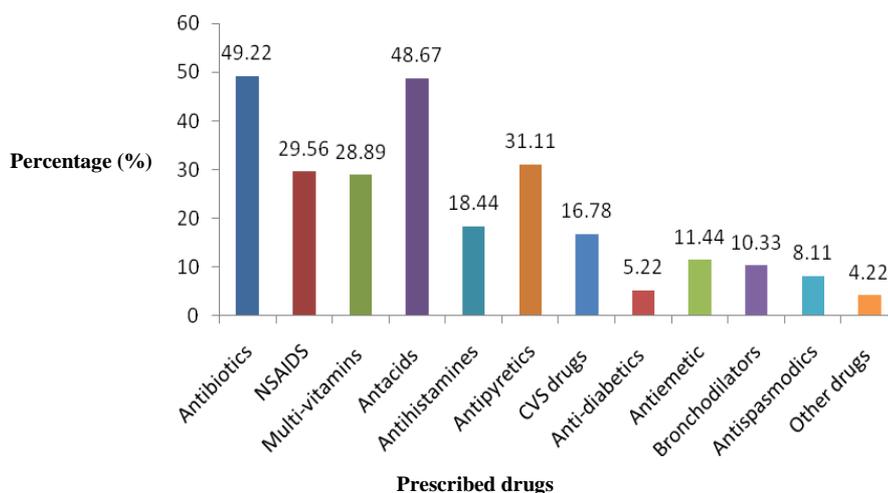


Fig.1: Therapeutic classification of drugs

### Superscription errors

One of the most commonly omitted information was the patient's gender and its frequency of occurrence was 59.33%.

### Classification of prescribed drugs

The prescribed drugs were checked manually with the help of textbooks such as Bangladesh National Formulary and the British National Formulary. In addition, the prescriptions were also checked by following the QUIM guide. The frequencies of different class of drugs analyzed in the prescription includes Non-steroidal anti-inflammatory drugs (NSAIDs), multi-vitamins, antibiotics, antihistamines, antipyretics, antacids, cardiovascular system (CVS) drugs, oral contraceptives, anti-emetics, antispasmodics, bronchodilators, anti-diabetics, etc [18].

### Types of prescription errors

Hand written outpatient prescription errors were identified by following the survey conducted in Oman [19].

### Superscription errors

The superscription errors of omissions are classified based on the information omitted on patient age, name and gender.

### Inscription errors

The inscription errors considered in this survey includes an incomplete information on dosage form, strength of medicine, dose and duration of therapy.

### Subscription errors

The subscription errors considered in this survey includes information omitted on direction for drug use, illegible hand writing, prescriber's signature, and date of prescription.

## RESULTS

### Classification of prescribed drugs

A variety of drugs were prescribed; however, only the drugs with frequencies higher than 1% of total prescribed drugs were depicted in Figure 1. The drug with highest frequency of occurrence was antibiotics (49.22%), the second highest category of drugs was antacids (48.67%) and the third highest drug prescribed was antipyretics (31.11%) of total prescription. NSAIDs, multi-vitamins, antihistamines and CVS drugs were also found to be most commonly prescribed, 29.56%, 28.89%, 18.44% and 16.78% respectively. Furthermore, anti-emetic, bronchodilators, anti-diabetic and oral contraceptives were drugs with the lowest frequency, 11.44%, 10.33%, 5.22% and 0.89% respectively shown in Figure 1.

In addition, the second most important omitted factor was age of the patient (10.44%). The name of the patient was absent in 5.11% of prescriptions shown in Figure 2.

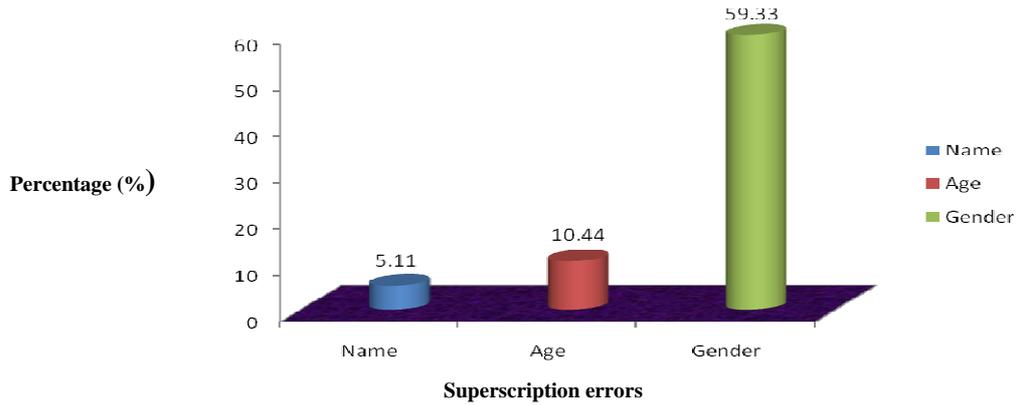


Fig. 2: Superscription error of omissions

**Inscription errors**

The analysis of inscription revealed that 43.78% of prescription omitted the strength of medicine, 37.56% of prescriptions omitted the direction for use of prescribed medication.

In 12.78% of handwritten outpatient prescriptions, the dosage form of prescribed medication was not mentioned by the prescriber. A significant number of prescriptions (16.44%) were also found to omit the information on dose and duration of therapy, Figure 3.

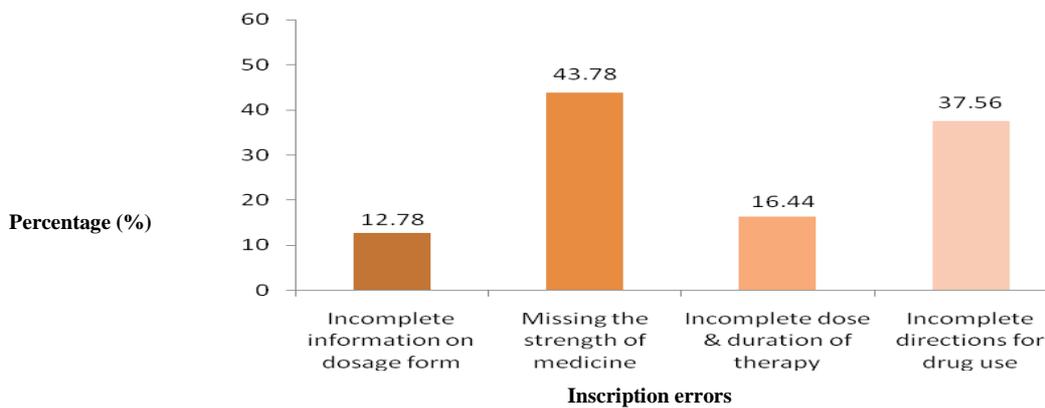


Fig.3: Inscription errors of omissions

**Subscription errors**

The third part was subscription which was analyzed for errors of omissions, as described in the method. Three types of omission were

detected in subscription. The number of prescriber signature omitted was 7.78%, while the date of prescription was absent in 23.78% and illegible hand writing was 50.67% of outpatient prescriptions collected, Figure 4.

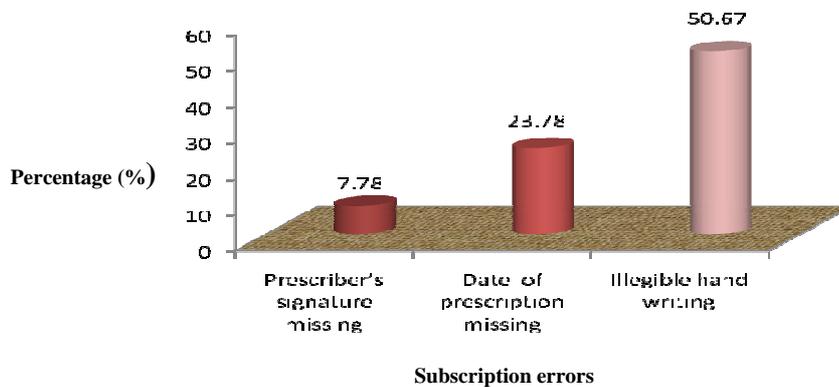


Fig. 4: Subscription errors of omissions

## DISCUSSION

A total of 900 prescriptions were collected from five different cities named Rajshahi, Jessore, Nagaon, Pabna and Chalna of Bangladesh, in which a total of 2366 drugs were prescribed. The average drug per prescription was 2.63 and the range was 06 for the maximum drugs prescribed per prescription and the minimum drug prescribed was one. The literature suggests that frequency of error increases with an increasing number of drugs [18]. One of the reasons for this diversity may be due to the number of doctors and the different geographical region of the study. The highest frequencies of prescriptions were found for antibiotics (49.22%) which are low to the very recently published study [20].

The highest superscription error of omission was gender (59.33%) which has a great impact on the medication. For example, some medications react more fast or better with female than male. So, gender play role in prescribing medication. The second highest omission in superscription was age (10.44%) which is very important in terms of dose and dosage form and much lower than the 52.4% of Indonesian study [11]. These results are in line with the study carried out in Nepal [14].

The highest number of omissions in inscriptions observed was strength of medicine was missing in 43.78% of prescription which might lead to wrong dose taken by patient and sometimes might cause overdose of medicine. 37.56% of prescription had no direction for drug use which was not clearly written, or omission of that may lead to dispensing errors [21] which could also lead to misunderstandings. For instance, some drugs are to be taken in only at night and some combination cannot be taken altogether due to some harmful interactions. Directions should be clear, complete, and should provide careful instructions to the pharmacist for the patient. The results are found to be higher than 26.43% of recently reported study [11], 25% reported by Nadeem, *et al.* [7] and 25.53% of study done in teaching hospital in India [5]. Based on a survey conducted in a general practice in US, the highest frequency of errors was due to incomplete direction or not mentioned at all, followed by the strength of drug omitted and prescribed quantity omitted [22, 23]. However, 16.44% of prescriptions were without dose and duration of therapy which would help to reach the target and prevent adverse effects. These results are lower than the 26.43%, 25%, and 25.53% as reported by previous studies [5, 7, 11].

As shown in figure 4, the highest frequency of subscription error of omissions was obscure hand writing of the physician which is 50.67%. It creates definitely serious problems to the retail pharmacist who sometimes misinterpreted or even dispenses wrong medicine to the patient. The prescriber's signature is imperative, without it the drug cannot be dispensed to the patient. The rate of occurrence of this error was 7.78%, which is higher to 5% and 5.1% of occurrence as reported in the studies [5, 7]. However, another type of error occurring considerably high is the date of prescription (23.78 %). The date of prescription is essential part of record. 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. The amount of this error in the present study was higher than the 1.02% of study carried out in India and 7.42% of study in Indonesia [7, 11].

The implications of our findings are significant. First, it is clear that handwritten outpatient prescription errors of omission are abundant in Bangladesh as found in different countries of the world [5, 7, 11, 14, 24, 25]. Second, clinical pharmacist has a significant role to play in avoiding significant prescription errors and improve the mechanism of patient care by working together with all health professionals [8].

## CONCLUSION

This study is a small attempt to represent prescription errors at five cities in Bangladesh. From our study it is clear that prescription errors are highly prevalent for outpatients in Bangladesh. Therefore the study necessities the large scale research on prescribing errors in different cities, specialties and hospitals in order to get the actual scenario of Bangladesh. Besides, the study suggests the prescriber's

to be more professional, cared, focused and concentrated during prescription for the outpatients. Furthermore, the study urges the inclusion of clinical and retail pharmacist to reduce the prescription error of omissions in Bangladesh.

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