

PRESCRIBING PATTERN AND ANALYSIS OF PRESCRIPTION ERRORS OF SEVEN HOSPITALS OF JESSORE, JHENAIDAH, KUSHTIA AND CHUADANGA DISTRICTS OF BANGLADESH

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Abstract

Prescription errors are commonly encountered in health care settings which are done either unintentionally or intentionally that can direct faulty health care thus jeopardizing patient care. Knowing the magnitude and reasons behind such errors is the first step in trying to prevent them. The objectives of our study were to identify the types of prevalent errors in prescriptions and types of diseases and medication patterns among the patients. We conducted our study on the basis of WHO (World Health Organisation) guidelines and collected 200 prescriptions from seven hospitals of Jessore, Jhenaidah, Kushtia & Chuadanga districts of Bangladesh in between October, 2016 to March, 2017. In the collected 200 prescriptions, 106 were male and 94 were female patients, most of the patients were suffering from cardiovascular disease (43%), most prescriptions (102) contained tablet dosage form. We also observed the total 1012 drugs, whereas, mostly prescribed drugs were acid related preparations (29.74%) and anti-microbials (13.14%). Furthermore, average number of drugs in every prescription was 5.06 and among them only 0.88% drugs were prescribed by their generic names. Moreover, in our study, the most omissions in the superscription part of the prescriptions were the absence of prescriber's (30) and patients' (52) address. In addition to, in inscription section, we found that the mostly found errors were interaction between drugs (375) and in subscription section the most errors were illegible handwritings (47). To conclude, we can say that solving these errors in prescription are a times need and government should take necessary steps by engaging more hospital and community pharmacists to stop these problems for offering a better health care system to the people of Bangladesh.

Keywords: Prescribing pattern, prescription errors, hospitals, Bangladesh.

Introduction

Prescribing pattern of the health care professionals and analysis of these prescriptions is generally known as drug utilization study which is defined by the WHO as an organized procedure that is used to assess the nature of drug therapy by engaging in the judgment of prescription, drug dispensing and patient usage in a given health care system, against foreordained as well as settled upon criteria and standards, with unique accentuation on the resulting medical, social, and economic outcomes [1]. Prescription, an order written by doctors for patients, contains directions for pharmacists to compound or/and dispense medications regarding patients' consumption [2]. A prescription has four parts- (a) superscription which includes date, name, address, age of patients (b) inscription which is the body of a prescription that specifies the name and amount of each ingredient, dosage forms, strengths and route of administration (c) subscription which gives the directions to the pharmacists for compounding and dispensing, (d) transcription which gives instructions to the patient about dosage regimen [3]. Though unfortunate, prescription errors are a bitter reality in our health care structure. Approximately, 30% of problems occurring during hospitalization are related to medication errors [4]. Errors are feasible at any step of the health care process, from medication selection to drug administration. Various studies have demonstrated that patients admitted to health care facilities are harmed as a result of medication errors, majority of which are as a result of errors in prescriptions [5, 6, 7]. Errors in prescribing may be classified into three main categories: superscription, inscription and subscription. Prescribing errors may have various detrimental outcomes [8]. Hence, the segments of a prescription should be clearly written, free of drug-related oversight (incomplete prescription), commission (incorrect information), and integration errors, without nonofficial abbreviations and fulfill the legal requisites of an ideal prescription [9, 10]. A clinically significant prescription error occurs when, as a result of an improper observation or illegible writing, there is an unintentional notable reduction in the possibility of treatment being effective or increase in the risk of harm when compared with generally accepted practice [11]. The majority of errors are not only due to reckless behavior on the part of

health care providers, but also occurs as a result of the speed and complexity of the medication use cycle, combined with faulty systems, processes and conditions that lead people to make mistakes or fail to prevent them [12, 13]. A study reported that adverse drug events occurred due to errors during prescribing (56%), administering (34%) and dispensing (4%). [14].

Recently, a lot of studies have been conducted in different regions of our country regarding prescription errors. And through these studies, we got some alarming messages. A study conducted by Haque *et al.* suggested that the highest errors were found in the part of superscription in which the first and foremost error was the absence of patient's gender (64.33%), the second highest superscription error was the omission of patient's age (17.67%) and the third was an error under the same category was the absence of patients' name (5%). In inscription errors, the dose of drug was found to be omitted in about 26% of prescriptions, the dosage form of medication was omitted in 12.67% of prescriptions, the dosage regimen of drug was omitted in 28% of prescriptions and the complete direction for drug use was omitted in 42% of prescriptions. In subscription errors, the prescribers' signature was omitted in 10.67% of prescription, while the date of prescription was omitted in 4% of prescription and illegible handwriting was found in 46% of prescription [15]. Another study conducted by Biswas *et al* suggested that the amount of superscription error was 59.33%. In inscription category absence of strength (43.78%), absence of direction of use (37.56%) were most prevalent. Subscription error contained in the following study were absence of prescriber's signature (7.78%), absence of date (28.78%) and illegible hand writing (50.67%) [16].

Therefore, the present study was designed to understand the prescription pattern as well as to detect the prescription errors of in and out patients of seven hospitals in four districts of Bangladesh – Jessore, Jhenaidah, Kushtia and Chuadanga.

Materials and Methods

Study area, duration of research project and data collection process:

A cross-sectional study was conducted to the inpatients & outpatients of seven hospitals (Chowgacha Upazila Health Complex, Jessore; Jessore 250 Bedded General Hospital, Jessore; Ad-din Sakina Medical College Hospital, Jessore;

Queens Hospital pvt. Ltd., Jessore; Jhenaidah Sadar Hospital, Jhenaidah; Kushtia 250 Bed General Hospital, Kushtia; Chuadanga Sadar Hospital, Chuadanga) in Jessore, Jhenaidah, Kushtia & Chuadanga districts of Bangladesh. 200 prescriptions were randomly collected from inpatient & outpatient departments of the participating hospitals during October, 2016 to March, 2017. All the data for the analysis were extracted from these 200 prescriptions.

Study parametres:

General prescription pattern: Each individual indicator was analyzed by using the following drug indicators suggested by the WHO [17] to evaluate the drug prescription pattern:

- Total number of drugs in the prescription.
- Average number of drugs per prescription.
- Percentage of drugs prescribed by generic name.
- Percentage of prescriptions with antimicrobials prescribed.
- Percentage of prescriptions with injectable preparations.

Moreover, some other parametres such as percentage of drugs prescribed: analgesic, anti-rheumatoid and anti-inflammatory, vitamins and minerals; disease patterns; percentage of drugs with tablet dosage form and acid related preparations; variables: age, gender and body weight were also analyzed for assessing prescription pattern.

Categories of prescription errors:

During analysis of the 200 prescriptions, we searched the following types of prescription errors. Prescribing errors found in our study are as follows-

- Average number of errors per prescription
- Absence of strength of drugs.
- Illegible hand written drugs.
- Improper abbreviation.
- Total number of drug interactions.
- Total number of prescriptions having drug interaction.
- Therapeutic duplication.
- Absence of prescriber's address.
- Absence of patient's address.
- Absence of date of prescription prescribed.
- Missing of instructions & special warning.
- Absence of prescriber's signature.

Ethical considerations:

The research project was conducted following the section 12 of WMA declaration of Helsinki and this

study was also logistically supported by the Department of Pharmacy, Jessore University of Science and Technology, Bangladesh [18]. The Institutional Animal Ethical Review Committee of Jessore University of Science & Technology, Jessore, Bangladesh approved the protocol of this research project. The whole procedure was completed with the consent of these seven hospital authorities and confidentiality of the patients was maintained strictly.

Data analysis process:

Data were entered, calculated as well as graphs were drawn by Microsoft excel 2013 software (Microsoft, Redmond, Washington, USA). All drugs were classified according to the Anatomical Therapeutic Classification System (ATC) recommended by the World Health Organization (WHO). The drug-drug interactions were checked using Medscape drug interaction checker. Prescribing errors were assessed by comparing the prescribed drugs with national standard treatment guidelines, textbooks and softwares. Descriptive statistics like frequency and percentage were computed by SPSS software (version 23; IBM Corporation, New York, USA) to determine the overall prevalence of prescribing errors.

Results

In our study, a total of 200 patient's prescriptions were analyzed. The majority of the patients were male 106 (53%) and 94 (47%) patients were female with 13.5% of them aged between 18-60 years. Surprisingly the body weight of any patient was not written in any prescription (Table 1).

However, we made an attempt of analyzing the disease pattern. Here, we found that majority of the patients were victim of cardiovascular disease (46%). Other patients suffered from central nervous system disease (10.5%), respiratory tract infection (5.5%), urinary tract infection (7.5%) and gastrointestinal tract infection (33.5%) respectively. These data are depicted in Figure 1.

Main dosage form prescribed here (within 200 prescriptions) was tablet (51%). Other dosage forms were also present such as injection (38%), capsule (8%), suspension (10.5%), suppository (6.5%) and syrup (15%) (Figure 2).

In this research project, the total number of drugs found in 200 prescriptions was 1012 having 5.06 drugs per prescription. Moreover, very few drugs were prescribed by generic name (0.88%). These data are represented in table 2.

Total number of drugs in our prescription was 1012. Among these, the most prescribed drugs were of acid related preparations (301). Then the second most prescribed drugs were anti-microbial drugs (133) (Figure 3).

From a total of 200 prescriptions, a total of 890 prescribing errors were detected representing 4.15 errors per prescription. All of the prescribing errors are classified into the following three groups-

Superscription errors: One of the most common prescription error that falls into this category were patients' details or address (52) and prescriber's affiliation (30) (Figure 4).

Inscription error: In this category, absence of drug strength (180), improper abbreviation (55), drug-drug interaction (375), therapeutic duplication (25), missing instruction and warnings (90) were most prominent. These data are shown in figure 5.

Subscription error: In this last category illegible handwriting (47), absence of prescribing date (21) and absence of prescriber's signature (15) were notable. Figure 6 depicts the overall scenario.

Discussion

A prescription which is given by a doctor or physician is taken as an indication of the doctor's or physician's attitude towards the disease and the role of drugs in its treatment [19]. The central priority of health care system is providing the right medicine to the right people at the right time [20]. In our study we collected 200 prescriptions where 106 were male and 94 were female patients. Most of the patients were above 60 years old. We observed that in the data of this research project, most of the patients were suffering from cardiovascular disease (43%) and gastrointestinal disorders (33.5%). We also noticed that most prescriptions (102) contained tablet dosage form.

It is important to note that drugs should be prescribed in their generic names to avoid confusion. In this study the average number of prescribed drugs were 5.06 and drugs were prescribed by generic name is 0.88%. Although there are both advantages and disadvantages of generic prescribing. In this current study, we observed that among the total 1012 drugs mostly prescribed drugs were acid related preparations (29.74%) and anti-microbials (13.14%). Another study conducted by Haque *et al* in Rajshahi division showed that mostly prescribed drugs were antibiotics (18.25%) [15]. In another study by Biswas *et al* revealed that mostly prescribed drugs were also antibiotics (49.22%) [16]. According to WHO 15-

25% of prescriptions with antibiotics are expected in most of the developing countries, where infectious diseases are more prevalent [21]. Our data differed from these previously conducted study because there was a possibility that the awareness regarding the devastating effects of excessive antibiotics ingestion was increased. In our study average number of prescribed drugs were 5.06.

In our study the most omissions in the superscription part of the prescriptions were the absence of prescriber's and patients' address. Whereas, in other studies the section contained errors such as absence of name of the patients, age, and gender [15, 16]. In inscription section we found that the mostly found errors were interaction between drugs. But in other studies the mostly found inscription errors were missing of dose [15] and incomplete dosage regimen [16]. In subscription section the most errors were illegible handwritings which are similar as other studies [15, 16].

Conclusion

Prescription errors are recognized as a great concern in our health sector. Therefore, active as well as cautious steps are needed to stop these problems. We should find out not only the problems with prescriptions but also the problems of the prescribers who are involved in such careless act. The problem can be minimized by spreading awareness among the prescribers to follow prescription writing practices as per 'WHO Guidelines on Good Prescribing' [22]. Furthermore, the study urges the urgency of clinical and retail pharmacist to reduce the prescription error in Bangladesh.

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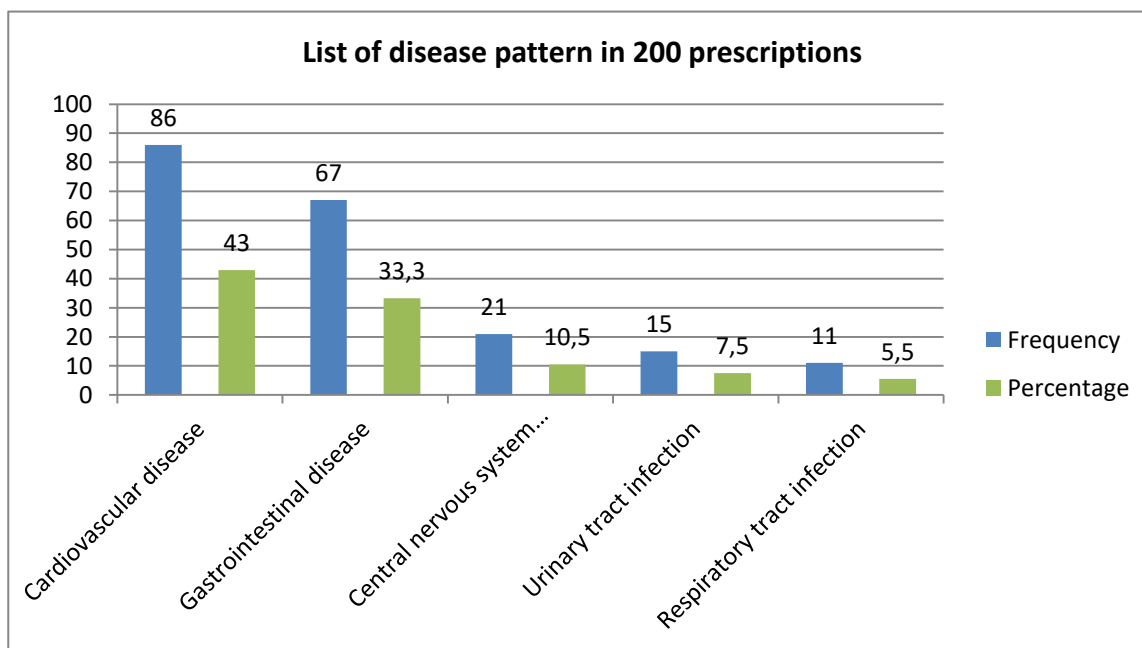
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Table 1: Characteristics, frequency and percentage of patient's variables.

Variables	Characteristics	Frequency (N)	Percentage (%)
Age	≤ 17 years	16	8
	18- 60 years	27	13.5
	> 60 years	157	78.5
Gender	Male	106	53
	Female	94	47

Table 2: Pattern of WHO core drug use indicators [17].

Characteristics	Value
Total number of drugs in the prescription	1012
Average number of drugs per prescription	5.06
Percentage of drugs prescribed by generic name	0.88%
Percentage of prescriptions with antimicrobials Prescribed	133 (13.14%)
Percentage of prescriptions with injectable Preparations	142 (14.03%)

**Figure 1:** List of disease pattern in 200 prescriptions.

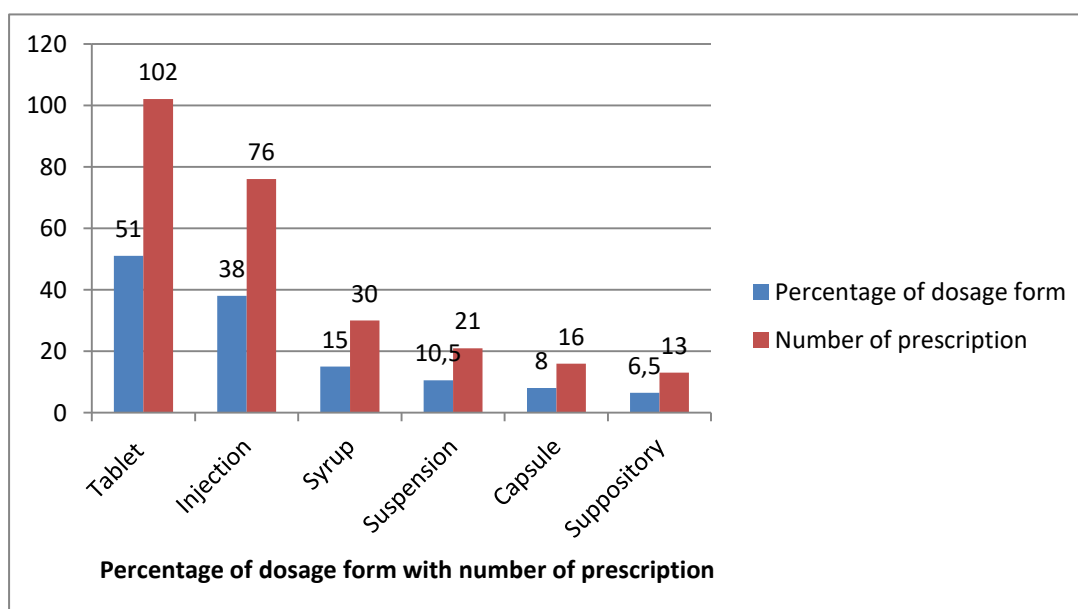


Figure 2: Percentage of dosage form with number of prescriptions.

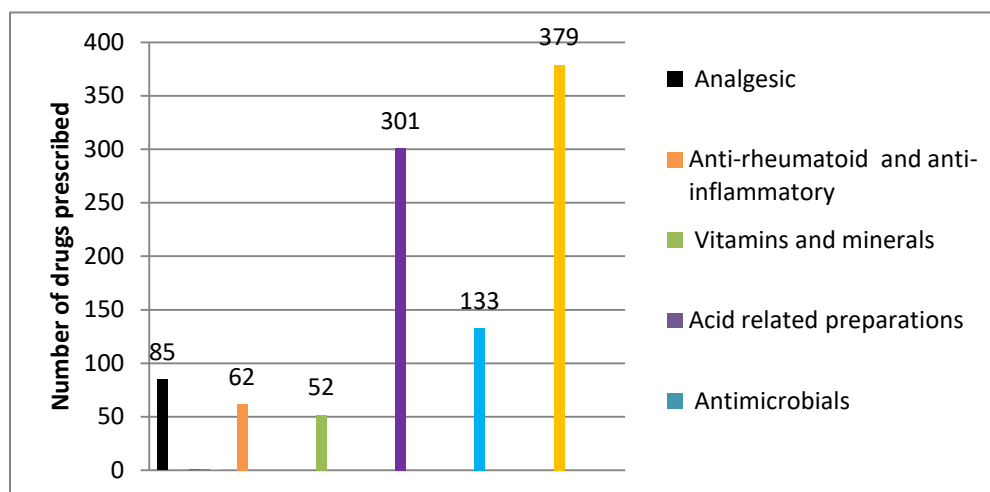


Figure 3: Total number of drugs prescribed by their therapeutic class.

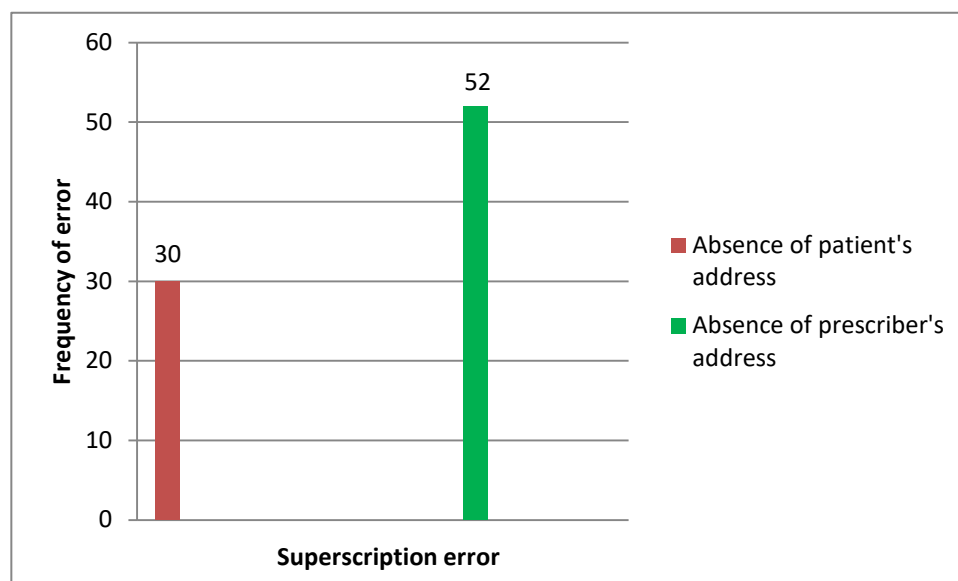


Figure 4: Superscription errors.

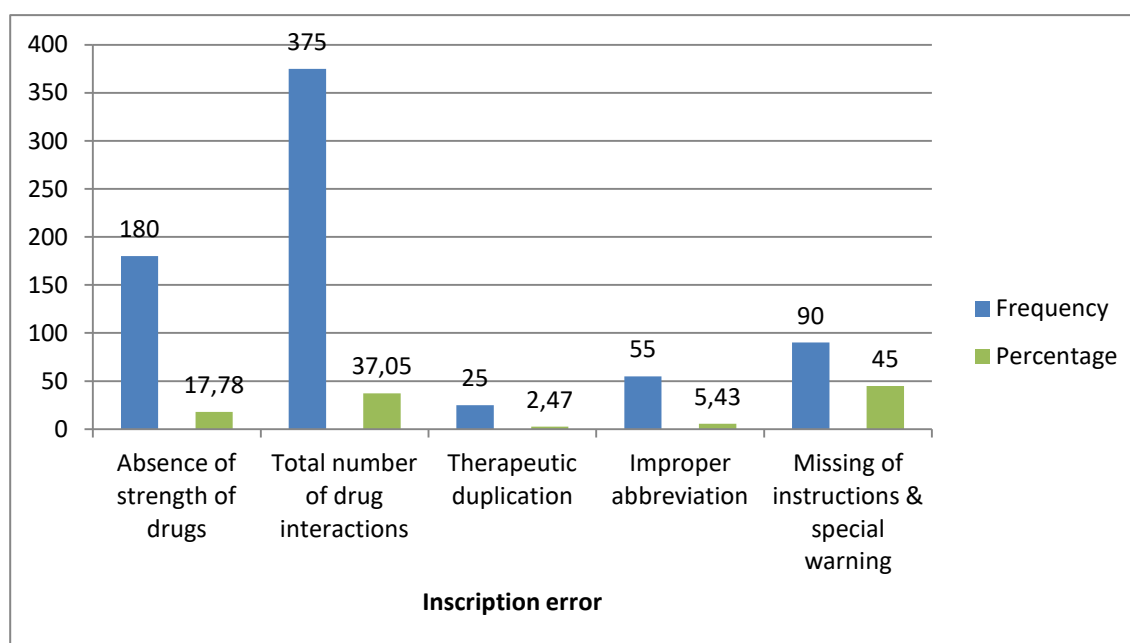


Figure 5: Inscription errors.

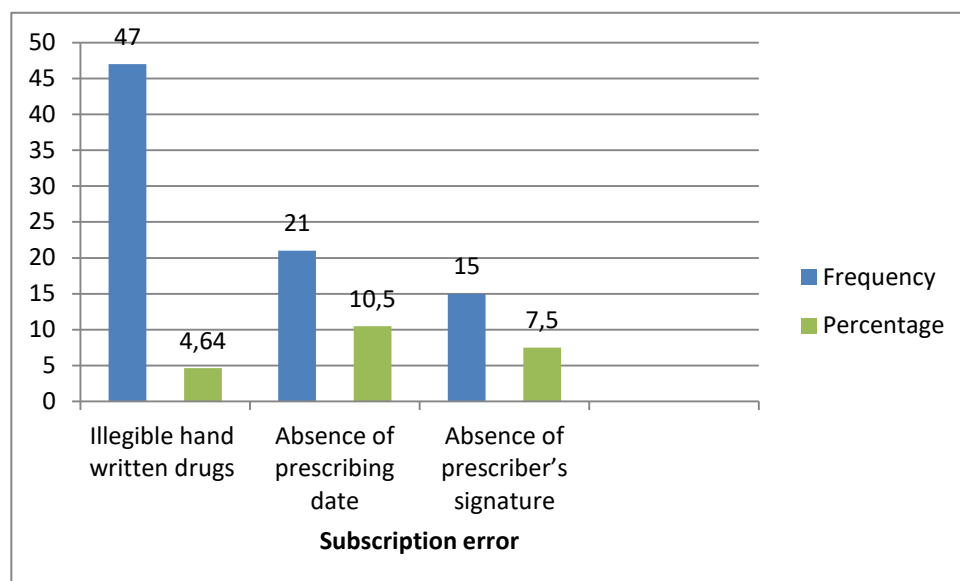


Figure 6: Subscription error.