

Original Article

DRUG PRESCRIPTION PATTERN OF PHYSICIANS USING WHO PRESCRIBING INDICATORS:  
A CROSS SECTIONAL STUDY

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ABSTRACT

**Background:** Prescriptions are one of the prescribing standards to promote the rational use of drugs. To provide a corrective message to prescribers, it is important to evaluate prescription patterns and identify unreasonable prescribing practices. Keeping these facts in consideration the present study was planned to assess the prescription pattern using WHO prescribing indicators.

**Methods:** The cross-sectional study was conducted at outpatient department of Dhaka Medical College Hospital and Sir Salimullah Medical College Mitford Hospital, Dhaka from January to December, 2022. A systematic random sampling technique was used to select prescriptions and data were collected by observation check list. Data were analyzed by statistical software- SPSS 23 version. Ethical issues were maintained strictly.

**Results:** Around 296 prescriptions were analyzed. Average number of drugs per prescription was 3.5 (optimal value 1.6–1.8). About 1043 drugs were prescribed, from which 24.73% were with their generic name (optimal value 100%), antibiotics and injections were prescribed 57% (optimal value 20.0–26.8%) and 3.37% (optimal value 13.4–24.1%) respectively. About 32.7% drugs were prescribed from the Essential Drug List. During the study period, anti-ulcerant and NSAIDs were highest prescribed drug (69.3%) followed by antibiotics (57.1%).

**Conclusion:** The study result revealed that average number of drugs per encounter, generic formatting, antibiotic prescribing, and the use of Essential Drug List (EDL) of the hospital to prescribe drugs out of the recommended values. Periodic training and initiating the performance evaluation for doctors are effective ways for improving prescription quality. There is a need to standardize the format of prescriptions so that all essential information is included.

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INTRODUCTION

The physician practice variation has a pronounced effect on healthcare spending increment. The variation in physician practice explains the difference in expenditure in the health sector. Patient outcome also varies with practice variations. The people in the third world countries double their expenditure on drugs every 4 years while Gross National Product (GNP) doubles in every 16 years<sup>1</sup>. The use of too many medicines per patient (polypharmacy), inappropriate use of antimicrobials for nonbacterial infections, overuse of injections when oral formulations would be more appropriate, and failure to prescribe in accordance with clinical guidelines are a common trend for irrational use of

drugs<sup>2</sup>. So, to maximize benefits and to promote human wellbeing, drugs must be used rationally.

Rational drug use is how drugs would be taken for their appropriate clinical needs, in doses that meet patients' own individual requirements for an adequate period, at the lowest cost to them and their community. Prescriptions are one of the prescribing standards to promote the rational use of drugs. It is a written therapeutic transaction between the prescriber and dispenser<sup>3</sup>. It is a written order by the prescriber to the dispenser on how the medicine should be dispensed. It serves as a means of communication among the prescriber, dispenser, and medicine consumer pertaining to treatment or prophylaxes<sup>2</sup>.

One of the main causes of irrational drug usage is irrational prescription. Ineffective unsafe therapy, the aggravation or prolonging of sickness, patient suffering and injury, and increased expenditures are all consequences of poor prescription practices. Incidence of irrational prescribing practice cannot be reduced without a critical intervention by assessing the causes. To improve the overall drug use, especially in developing countries, international agencies like the world health organization (WHO) and the international network for the rational use of drugs (INRUD) have engaged themselves to evolve standard drug use indicators<sup>4</sup>. Another approach to preventing irrational prescribing habits is prescription audit (PA), from which they get regular feedback about their prescriptions<sup>5</sup>.

Assessment of drug use pattern has not been regularly conducted in most of the government health facilities in which many patients are being served, and this has its own limits on the intervention to promote rational use of drugs. To provide a corrective message to prescribers, it is important to evaluate prescription patterns and identify unreasonable prescribing practices. Keeping these facts in consideration the present study was planned to assess the prescription pattern in the Medical OPD of Dhaka Medical College & Hospital (DMCH) and Sir Salimullah Medical College Mitford Hospital (SSMCH).

**MATERIALS AND METHODS**

The cross sectional study was conducted in the outpatient department of DMCH and SSMCH during the period of October to December, 2022. The study population was the prescription provided by the doctors of OPD. Inclusion criteria were prescriptions which contained at least one drug. Systematic random sampling was used to select a total 296 prescriptions from patients attending OPD of the selected hospitals. All the information was retrieved from the prescriptions. Before processing the data, it was checked for completeness and internal consistency following the norms of missing data. Data analysis was done using Statistical Package for the Social Sciences (SPSS) version 23.

**Measurement:** The WHO prescribing indicators were used in this study. The prescribing indicators included

1. The average number of drugs prescribed per encounter was calculated to measure the degree of polypharmacy. It was calculated by dividing the total

number of different drug products prescribed by the number of encounters surveyed. Combinations of drugs prescribed for one health problem were counted as one.

2. Percentage of drugs prescribed by generic name is calculated to measure the tendency of prescribing by generic name. It was calculated by dividing the number of drugs prescribed by generic name by total number of drugs prescribed, multiplied by 100.

3. Percentage of encounters in which an antibiotic was prescribed was calculated to measure the overall use of commonly overused and costly forms of drug therapy. It was calculated by dividing the number of patient encounters in which an antibiotic was prescribed by the total number of encounters surveyed, multiplied by 100.

4. Percentage of encounters with an injection prescribed was calculated to measure the overall level use of commonly overused and costly forms of drug therapy. It was calculated by dividing the number of patient encounters in which an injection was prescribed by the total number of encounters surveyed, multiplied by 100.

5. Percentage of drugs prescribed from an NLEM was calculated to measure the degree to which practices conform to a national drug policy as indicated in the national drug list. Percentage is calculated by dividing number of products prescribed, which are in NLEM by the total number of drugs prescribed, multiplied by 100.

**Ethical consideration:** The permission of this study was approved by the institutional review board of National Institute of Preventive and Social Medicine (NIPSOM), Mohakhali, Dhaka, Bangladesh under the registration number NIPSOM/IRB/2017/109. Formal permission of data collection in the hospitals was taken from the respective directors of the institution.

**RESULTS**

A total of 1043 drugs were prescribed in all prescriptions. Average number of drugs per prescription was 3.5. Only 24.73% of the drugs were prescribed under generic name. Antibiotics constituted 57% of prescription. Injections were prescribed in about 3.37% of prescriptions. Only 35.68% of prescriptions were complete in regard standard prescription format. About 32.7% drugs were prescribed from the Essential Drug List (EDL) (Table- 1).

**Table 1: Prescribing indicators**

Indicators	Results	Standard Value (WHO)
The average number of drugs prescribed per encounter	3.5	1.6-1.8
Percentage of drugs prescribed by generic name (%)	24.73	100

Percentage of encounters with an antibiotic (%)	57	20.0- 26.8
Percentage of encounters with an injection (%)	3.37	13.4-24.1
Percentage of drugs from essential drug list (%)	32.7	100

**Figure-1: Percentage of drugs prescribed per prescription**

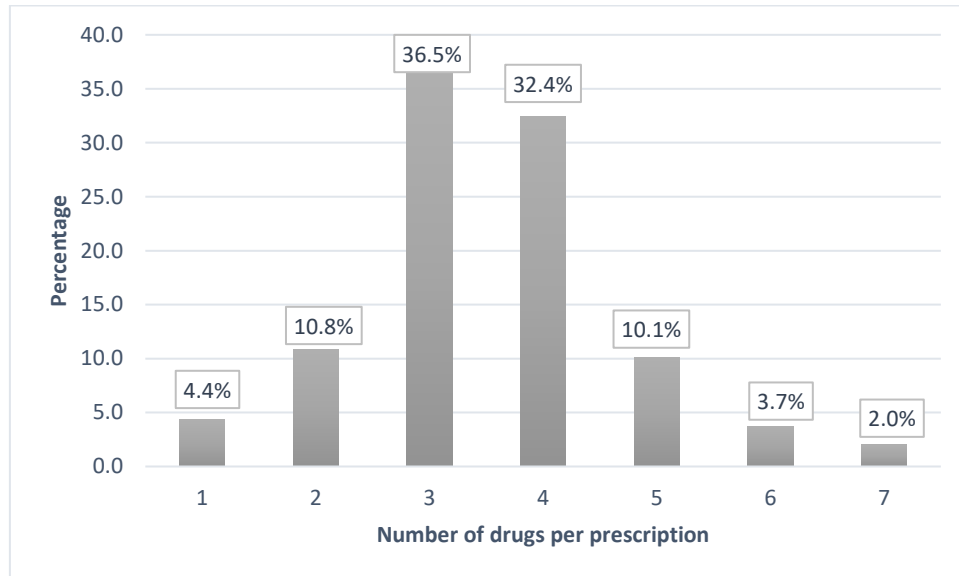


Figure shows that 5 or more drugs were prescribed in 15.8% prescriptions (Figure-1).

**Table 2: Category-wise prescribing frequency**

Drugs Category	Number of Prescriptions	Percentage
Anti-ulcerative	205	69.3
NSAIDs	205	69.3
Antibiotics	169	57.1
Antihistamine	108	36.5
Anti-asthmatic /Bronchodilator	96	32.4
Sedatives	52	17.6
Antihypertensive Anti-emetic	35	11.8
Vitamin/Minerals	30	10.1
Anthelmintic	25	8.44
Ophthalmic preparations	18	6.1
Anti-fungal	18	6
Antipsychotic	17	5.74
Dermatological preparations	12	4.05
Steroids	11	3.7
Anti-emetic	6	2.0

**ATC Anatomical Therapeutic Chemical classification system:** During the study period, anti-ulcerant and NSAIDs were the most drug,

prescribed (69.3%) followed by antibiotics (57.1%) (Table-2).

**Table-3 - Essential points of prescription by WHO**

	Percentage
Name, age, sex, address of the patient	100
Duration of the drugs	100
Chief complains	91.6

clinical diagnosis	64.5
lifestyle modification	37.5
follow up	73.6
advice of referral	14.2
future treatment plan	31.1
Doctor's seal	43.3

## DISCUSSION

WHO has identified specific drug use indicators that include number of drugs, use of antibiotics, injections and generic names in prescribed drugs and adherence to Essential Drug List<sup>7</sup>. In my study, a total of 1043 individual drugs were prescribed for 296 prescriptions, giving an average of 3.5 drugs per encounter. which was comparable with the results of China that was 3.52<sup>8</sup>. Average number of drugs prescribed was higher than the relevant research findings in Goa, India which was 1.8<sup>9</sup> and in Nepal it was 3.39<sup>10</sup>. The study result of average number of drugs prescribed per encounter was 3.5 with a maximum of 7 drugs, which is not within the range as compared with the standard (1.6-1.8) derived as ideal and was not acceptable compared with the WHO's recommended value of 1.3-2.0<sup>2</sup>. It also showed that more than half of the patients (84.8%) were given three or more drugs. Since, WHO has recommended that average number of drugs per prescription should be 1.3-2.0, the results of the study reflect polypharmacy which may lead to increase the risk of drug interactions, adverse drug reactions, dispensing errors, decrease adherence to drug regimens and unnecessary drug expenses. In my study among 1043 drugs, 258 (24.73%) drugs were written in generic name and the rest were in trade name. This finding is smaller than that of the WHO recommendation (100%)<sup>2</sup>. Studies conducted in different countries revealed that there was better generic prescribing practice, like North Ethiopia Felege Hiwot Referral Hospital 97.4% (14)<sup>11</sup>, Pakistan 71.6%<sup>11</sup>. In this study percentage of antibiotics prescribed was 57% that is higher than the standard (20-26.8)<sup>2</sup>. Though it is higher than India 31.8%<sup>9</sup>, Sri Lanka (47%), it was lower than Zimbabwe (58%), South Ethiopia (58%) and Nigeria (72.8%)<sup>11</sup>. The WHO recommended target for injection exposure is 13.4-24.1(WHO drug use prescribing indicators, 2014). In this study, the percentage of prescription with an injection encountered was 4.7% which is less than India 18%<sup>9</sup>. So, the observed proportion of injectable drugs prescribed may be considered acceptable according to WHO recommendations. Minimum use of injections is preferred and this reduces the risk of infection through parenteral route and cost incurred in therapy. The percentage of drugs prescribed from the EDL was 32.7% which is lower than the standard (100%)<sup>13</sup>. In this study, drugs prescribed from the NLEM is high when compared to prescription pattern in a similar study in India (31.36%)<sup>13</sup>, It was

lower than Tanzania (96%)<sup>14</sup>, and Ethiopia (96.6%)<sup>10</sup>. The low rate of prescribing from EDL of Bangladesh may be also contributed by excessive use of multivitamin and multimineral, NSAIDs and anti-ulcerant which are not enlisted in EDL of Bangladesh<sup>19</sup>. So that the higher percentage of non-essential drugs in this study were responsible for inappropriate use of medicines.

Guide to good prescribing by WHO<sup>12</sup> mentioned that a prescription should contain-name, address, telephone of prescriber, date, generic name of the drug, strength, dosage form, total amount, label: instructions, warnings, name, address, age of patient, signature, or initials of prescriber. In this study, majority of prescriptions adhere to the ideal pattern of prescription writing. Important demographic parameters like name, age, sex, and address of the patient were written in 100% of the prescriptions in the present study indicating that the physicians adhere to the pattern of prescription writing. In this study chief complains were written in 91.6% prescriptions, clinical diagnosis was written in 64.5% prescription. At least one investigation was written in 82.4% prescriptions. Minimum investigation in a prescription was 1, maximum 6, mean- 2. 37.5% prescriptions contain advice of lifestyle modification among 269 respondents. 73.6% prescriptions contain advice of follow up and 14.2% prescriptions contain advice of referral. Only 31.1% prescriptions contain future treatment plan of patients<sup>12</sup>.

In a study conducted in Dubai, patient's name was missing in 2.9% of instances, age in 9.7%, and sex in 12%<sup>16</sup>. These parameters are important as they help to establish the patient's identity and help in tracing the patient during the follow up visits. A brief note about the diagnosis of the disease is also helpful to the pharmacist to ensure that the drugs prescribed are appropriate for the patient's condition. In the present study, diagnosis was mentioned by the physicians in 64.66% of the prescriptions. Analysis of dosage form, frequency and duration of drug therapy and its route of administration were mentioned in 100% of prescriptions. The route by which the drug must be administered was specified by the physicians in 100% of the prescriptions. In a study conducted in Jammu, it was found that route of drug administration was mentioned in only 20% prescriptions<sup>17</sup>. The dosage form of the drug was mentioned by the treating physician in 98.66% of the total prescriptions. This figure is quite satisfactory as

dosage form was mentioned in only 80% of the prescriptions in a study conducted in Jammu<sup>6</sup>. The duration of treatment was specified in 92.66% of the total prescriptions. This contrasts with the study conducted in Jammu where the duration of therapy was mentioned in 66% of the prescriptions<sup>6</sup>. Limitations of the study were the data collected over a period of only three months, the sample size was small and seasonal variation in illness was not taken into consideration as because they might have affected disease patterns and antibiotic use. This data can provide the justification and direction for future studies examining trends of prescription patterns and therapeutic strategies to develop awareness about polypharmacy and good prescribing.

### Abbreviations

EDL: Essential medicine list; INRUD: International network for rational use of drugs

OPD: Outpatient department; WHO: World Health Organization.; LEM: National List of Essential Medicines; ATC: Anatomical Therapeutic Chemical classification system

### CONCLUSIONS

Based on the finding of the study, the prescribing practices for antibiotic and drugs by generic names show deviation from the standard recommended by WHO. As antibiotics are prescribed the most in our study, one needs to keep watch on usage of antibiotics to avoid resistance. The hospital should have a drug therapeutic committee. Updated treatment guideline and essential list of drugs should be available in all outpatient prescribing units. It came to light that the drug use patterns and prescription practices were irrational. In fact, the nation lacks any legislation pertaining to evaluating medical professionals' prescription competency. Prescribers ought to get periodic training on the rational use of medicines. Baseline data gathered by this study can be used by the researchers and policymakers to improve the prescribing practice.

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