ORIGINAL ARTICLE

A COMPREHENSIVE STUDY ON ASSESSMENT OF PRESCRIPTION AT TERTIARY CARE HOSPITAL, KATHMANDU, NEPAL

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ABSTRACT

Introduction: Assessment of prescription can prevent medication errors and prevent adverse effects related with prescribing and patients related factors at health-care setting resulting the decline in morbidity, mortality and treatment burden for patients. Hence, this study was conducted to analyze prescription writing for its completeness occurred in a tertiary care hospital at Nepal.

Method: A cross sectional, descriptive, prospective study was conducted at Manmohan Memorial Medical College and Teaching Hospital (MMTH), Kathmandu, Nepal during a time period from November 2023 to January 2024. A random sample of 394 prescriptions of patients were collected and reviewed from the outpatient department of the Hospital and filled in a pretested designed Performa containing prescriber information, patient information, diagnosis, superscription, inscription, subscription, signature. It is noted that whether this information mentioned properly or not by the prescriber at hospital setting.

Results: The study found completeness of prescription regarding the name, age, sex and address of the patients. The data of prescribers regarding the prescriber's name, qualification, Nepal Medical Council (NMC) registration number, signature and diagnosis were found to be 55.60%, 97.20%, 97.20%, 11.4% and 0.5% respectively. Dosage form, quantity, duration, dose, strength, frequency and route of administration were mentioned in 98%, 3.80%, 96.2%, 96.70%, 86.81%, 99% and 34% of the prescriptions respectively. Likewise, unauthorized abbreviation, illegible handwriting was found in 26.90%, 9.60% of the cases.

Conclusion: Overall, regular prescription assessments are essential to detect errors and drive continuous improvement in prescribing practices.

Key words: ***Prescription, Prescriber, Prescription Errors, Assessment of prescription***

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INTRODUCTION

The World Health Organization defines prescription as "an instruction from a prescriber to a dispenser." Prescription is one of the most important therapeutic transactions between physician and patient. The word " prescription" derive from pre (before) and "script" (writing written) which denotes that it is an order that must be written down before or for the prescription and administration of drug. The elementary requirements of a prescription are that it should state what is to be given to whom and by whom prescribed and give instructions on how much should be taken how often, by what route and for how long or total quantity to be supplied.[1]

The prescription writing guidance is given in WHO practical manual on Guide to Good Prescribing[2]. The senior researcher (MA) briefed the data collectors about the use of the WHO Guide to Good Prescribing. The same tool has been used in various studies to assess the quality of prescriptions quality and compliance with WHO standards.[3,4] A previous study showed that most physicians don't adhere to guidelines made by the regulatory body.

Different parts of the prescription are prescriber information, patient information, date, superscription, inscription, subscription, signatura & prescriber signature. Prescriber information contains the name, qualification & NMC registration number of prescriber. Similarly, patient information contains full name, age, gender, weight & address for identification of patient. It helps the pharmacist to check the dose of medicine.

Date is an important part of prescription which confirms that when the prescription is written & helps to keep medication record of patient. The superscription consists of the heading where the symbol "Rx" is found. The inscription provides medical information like name, dosage, strength, route of administration & dosage form of drug. The subscription gives specific directions for the pharmacist on how to compound the medication such as instructions for drug use like frequency, duration. The signature gives instructions to the patient on how, how much, when and how long the drug is to be taken. The prescriber signature makes the prescription legally valid.

Prescription errors are common which are of two types; errors of omission and errors of commission. If essential information is missed in the prescription, it is called error of omission, while errors of commission occur if wrong information is written in the prescription. Medication errors with incidence of adverse effects of drugs can be seen in approximately one million people annually worldwide including low- and middle-income countries as per WHO. Increase in adverse effects of drugs, morbidities, mortalities and burden of treatment costs are the consequences of them. Moreover, they also lead to lower trust of patients towards healthcare provider. If evaluation and identification of those errors are made by researchers in regular interval, they can be identified and corrected. Hence, in future, the detrimental consequences of those errors can be prevented and minimized. [5]

Therefore, the study was undertaken with an objective to assess the prescription due to the prescription writing such as errors of omission which will helps to develop and implement the required strategies to overcome prescription writing errors in future in Nepal.

METHODS

A descriptive prospective cross-sectional study was conducted among 394 patients with prescription reviewed at MMTH from November 2023 to January 2024 after ethical clearance from Institutional Review Committee (IRC) of MMIHS. The demographic and prescription related information were filled in the data collection form. Prescription order of out-patient (OPD) and in-patients visiting hospital pharmacy

How to Cite

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at MMTH were included and prescription order from other hospital prescribers and patients visiting pharmacies to purchase other than medicine were excluded.

Analysis of prescription was carried out by encountering the prescription errors. The prescription assessments are classified as related to prescriber (including patient name, age, prescriber name, prescriber qualification and Nepal Medical Council (NMC) number, prescriber signature and diagnosis), related to drugs (including generic name, route, dose, frequency, dosage form, duration of therapy and quantity to supply), number of prescriptions containing brand names of drugs, abbreviations and legibility of the prescriptions. Descriptive data with frequency and percentage were analyzed using SPSS version 25.

RESULT AND DISCUSSION

A total of 447 prescription data were collected out of which 53 prescriptions were excluded due to exclusion criteria. So, a total of 394 prescriptions were included according to inclusion criteria and analyzed for further study.

The study found the assessment of legibility of prescription and current prescription practice in a hospital setting of Nepal. A wide variety of components related to prescription writing were not mentioned . This study demonstrated every prescription contained at least one or more missing encounter per prescription. The result is similar to the study carried out at Nobel Medical Teaching Hospital, Biratnagar, Nepal.[6]

Patient Age Distribution

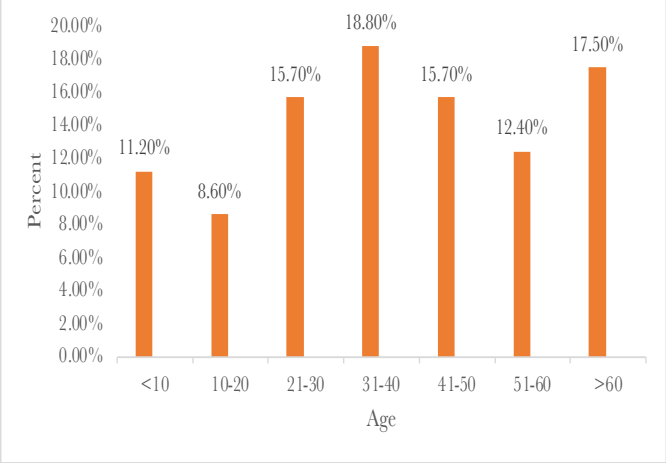

Figure1: Age of the patients(n=394)

The demographic profile of the patients is shown in Figure 1. The age group 31-40(18.8%) is the most common age group to visit the doctor followed by the age group of greater than 60 years (17.50%). Young adult age group of 10-20(8.60%) is the least age group visiting the doctor.

In Nepal, Karki N, et al. found more than 50 age group to be most common (50.20%), followed by 41-50 (14.30%). Age group of 1-10 were least common in the study (0.9%). These variations highlight different healthcare-seeking behaviors across age demographics and locations[7].

Patient Gender Distribution

Our study elicits that majority of female patients (53.30%) visited the hospital compared to male (46.70%). This is because the female population in Nepal is more than the male population.[8] In contrast, Karki et al. reported a slightly higher proportion of male patients (53.4%) compared to female patients (46.6%) in their study[8]. Possible factors contributing to these differences could include cultural norms, access to healthcare services, prevalence of specific health conditions affecting each gender, and socio-economic factors influencing healthcare-seeking behavior. In the study carried out by Khan et al, in Pakistan in 2019, the sex of female patient (44.6%) and male patient (55.4%) which was slightly different[7].

Table 1: Total number of medicines per prescription(n=394)

Total Medicine per prescription	Frequency	Percent (%)
1	50	12.7
2	86	21.8
3	131	33.2
4	69	17.5
5	31	7.9
6	19	4.8
7	4	1.0
8	2	0.5
9	2	0.5
Total	394	100.0

Triple therapy was found to be prescribed highest (33.2%) in the study which was a bit higher than the WHO recommended values 1.6 - 1.8 drugs per prescription which is similar to study conducted at Bharatpur in 2017[9]. Monotherapy was prescribed only in 12.7% of the patients while combination therapy was prescribed excess in comparison i.e. 87.3%. The study shows that there is polypharmacy in the prescription of medicine as the single prescription order contains more than five drug with the coverage of 14.7%. Similar result was found in study of Karki, et al in Nepal, combination therapy(56.2%) and polypharmacy (46.8%)[10]. Eight and nine drug was the lowest number of drugs prescribed in single prescription.

The study showed that most of prescription that is 33.2% had three drugs and 21.8% had two drugs. In contrast, the study at Bharatpur district hospital reported 32.5% of prescriptions had three drugs and 27.4% of prescriptions had four drug which is slightly higher than our study[9].

The study showed a maximum of nine drugs per prescription, which was found similar with our study. The polypharmacy might be due to presence of multiple comorbidity, lack of therapeutic knowledge to the prescribed, prescriber carelessness toward the possible adverse effects of medicine, lack of clinical practice guidelines or lack of therapeutically correct medicine. Low drug prescribing error can reduce the chances of drug interaction, unwanted adverse drug reactions (ADR), non-compliance by patient, bacterial resistance and financial burden to the patient.

Assessment of Prescriptions in Regard to Patients Information

Basic identifying information (patient name, age, date of visit) was consistently included in all examined prescriptions (100%) which was the result of use of computer software Medipro. This result was similar to study conducted in Nepal as well as in India.[11]

Analysis of Prescriber's Information

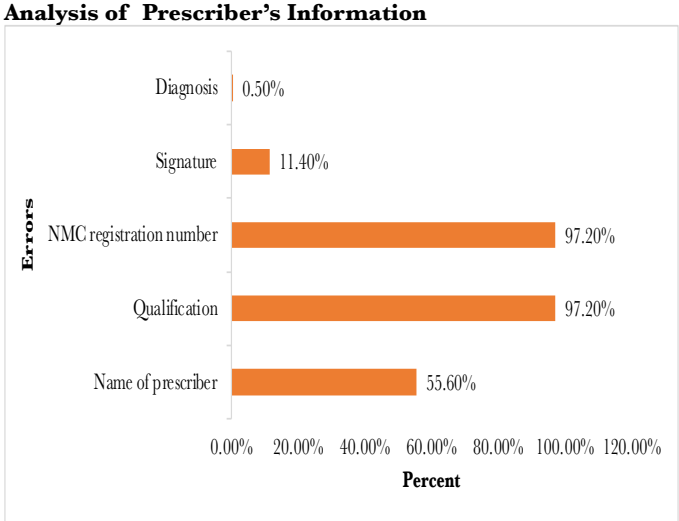

Figure 2: Assessment of incompleteness of prescription related to prescriber's information (n=394)

Information to identify the prescriber was severely lacking. The name of prescriber mentioned in only 44.4% but different pattern was seen in study conducted by Karki et al in Nepal (4.9%).[10] Percentage of encounters by qualification and NMC registration number of prescriber, a higher percentage of error was reported in our study i.e.97.2% among other errors relation with omission. Similar pattern was carried out at Biratnagar, Nepal [6], (i.e. 99.6%). The department was noted in 98.5% of prescriptions, showing slightly better compliance.

However, only 88.6% of prescriptions contained the prescriber's signature. In context of Nepal, a research found error related to signature to be 15.7% , India is 9.31%[11]and Pakistan is 37.1%.[7] The absence of the prescriber's signature would invalidate the prescription and cause inconvenience to the patient and staff involved. This is especially crucial if the prescription was for psychotropic or dangerous drugs (controlled drugs).

Diagnosis of the patient was also found in almost all prescriptions (99.7%) which is similar to the study carried out in Nepal i.e.100%. [8]. In the context of India, diagnosis error was found in 9.31% prescription.[11]

Analysis of Drug's Information

Table 2: Frequencies and percentage of responses regarding drug's information(n=394)

Drugs related parameters	Frequency	Percentage
Dosage form	386	98.0
Quantity	15	3.80
Duration	379	96.2
Strength	342	86.8
Dose	381	96.7
Frequency	390	99.0
Route	134	34.0
Accurate spelling of drug	369	93.70
Generic name	4	1.0
Abbreviation like Tb or T for tablets C for capsules PCM for paracetamol	288	73.1
Handwriting clear to read	356	90.4

The prescription related to quantity to be supplied and prescribing brand name (99%) was found to be in higher amount followed by route of administration (66%). The duration of therapy (96.2%) of the drug was frequently mentioned.

The generic drug name was used in 1% which is way more less than the study carried out by Irshaid et al. in Saudi Arabia i.e. 15.1%. The trend of writing brands name is similar to our study. The generic drug name was used in 1% which is way more less than the study carreied out by Irshaid et al. in Saudi Arabia that is 15.1%. The trend of writing brands name is similar to our study. Similarly 71.6% of medicines were prescribed using brand name in the hospital of Tanzania. This could be due to manufactures' incentives seminars and promotion form medicine importers, skepticism, and medicine baptization effects[12]. The practice of drugs with generic name gives an advantage to the pharmacist to dispense the cheapest drug or the one which is available. 9.6% of prescriptions had illegible prescriber handwriting, while study carried out by Irshaid et al. in Saudi Arabia, handwriting of the prescriber was not clear in 64.3% of prescriptions which is less in our study[12]. This writing practice can leads to serious medication error. A pharmacist may misread the name of a drug, the dosage, or the instructions for administration. This can lead to a patient receiving the wrong medication, the wrong dose, or taking the medication incorrectly. In our study, we found that 26.9% of prescriptions contained unauthorized abbreviations, 6.3% had misspelled drug names, and 9.6% had illegible handwriting. In contrast, Ansari and Neupane reported lower error rates of 27.5% for unauthorized abbreviations, 0.5% for wrong drug spellings, and 0.63% for illegible handwriting.[6] These findings suggest varying levels of prescription accuracy and quality between different healthcare settings. The relatively higher error rates in our study point to potential challenges in prescription writing practices, which could contribute to medication errors and patient safety risks.

Percentage of encounters by strength (86.81%), quantity of supply (3.80%), route of administration (34%) was recorded in this study. In India, study performed by Vaishali D Phalke, strength, quantity and route of administration of the drug response found on 73.20%, 65.30% and 75.30% prescriptions respectively[13]. Similarly in Malaysia, strength, quantity and route of administration of the drug response found on 43.70%, 94.20%, 20% prescriptions respectively. Higher percentage error related to quantity of drug supply was found in Nepal as compared to other countries.

Only 34% of prescriptions mentioned the intended route of administration. Similar pattern was found in study conducted by Ansari in Nepal i.e. 37.4%[6]. and Khan et al in Pakistan i.e. 49.3% [7]. This can cause confusion for pharmacists while dispensing the medicine.

Our study found incompleteness of prescription related to dose, frequency, and dosage form occurred at a lower rate than the findings reported by Karki et al. We observed a 3.30% error rate for dose-related errors, significantly lower than the 26.1% rate found in Karki's study. Similarly, frequency-related errors were higher in our study (1%) compared to Karki's findings (0%).

Additionally, errors related to dosage form occurred at a rate of 2% in our study, lower than the 5.4% rate reported by Karki et al[8]. These differences in observed error rates could suggest variation in practices, protocols, or other factors between the settings where the research was conducted.

Table 3: Frequency distribution of age and total number of medicines prescribed(n=394)

Age Group	Number of medicine prescribed									
	1	2	3	4	5	6	7	8	9	Total
<10	7	11	18	5	2	1	0	0	0	44
10-20	3	10	11	8	2	0	0	0	0	34
21-30	6	16	21	8	5	6	0	0	0	62
31-40	12	15	26	14	6	1	0	0	0	74
41-50	6	15	22	15	4	0	0	0	0	62
51-60	9	6	13	8	5	6	0	1	1	49
>60	7	13	20	11	7	5	4	1	1	69
Total	50	86	131	69	31	19	4	2	2	394

The data is segmented into distinct age brackets ranging from under 10 to over 60 years. Each age group exhibits a different pattern in the number of medicines prescribed. The total number of prescriptions (394) is highest among patients aged 31-40 years (74 prescriptions) and those over 60 years (69 prescriptions). Patients aged 10-20 years have the lowest number of prescriptions (34 prescriptions). There is a steady increase in the average number of medications prescribed per person as age increases, from under 10 to 41-50 years old. This trend suggests that older patients and middle-aged adults require more medications per prescription compared to younger age groups.

To ensure patient safety and optimal medication use, clear prescription guidelines must be in place and enforced. Ongoing training for prescribers must stress legible handwriting, avoidance of unclear abbreviations, and the use of generic drug names to enhance affordability[14]. Every prescription was identified to have one or more incompleteness. To reduce the probability of writing errors, it is necessary to highlight the legibility of prescriptions, the correct spelling of drugs, approved abbreviations, and all other information connected to the patient, prescriber, and drugs. The habit of writing brand name is in higher rate which needs to be reduced. The average number of drugs prescribed per patient was slightly higher to WHO's range[15].

CONCLUSION

This research has generated further need for the continued training and education of prescribers on rational use of drugs and on adherence to WHO and national prescribing indicators. Hospital-specific STGs, when implemented, along with routine audits and feedback, are pivotal in enhancing prescription quality. Moreover, stronger role fulfilment by clinical pharmacists and promotion of interprofessional collaboration can ensure patients' safety with enhanced treatment results. Prescribing practices at the hospital were in general moderately satisfactory, but there was room for improving towards rational, cost-effective, and patient-centered pharmacotherapy.

RECOMMENDATION

Further multi-center studies are suggested to provide the input to the policy makers.

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AUTHOR CONTRIBUTIONS

Usha Giri took the overall responsibility for the study, including conceptualization, methodology development, analysis, finalization of the manuscript, Sujan Paudel and Deepti Piya Baniya led the preparation of the theoretical framework, methodology, data collection and analysis, and draft preparation, Sabin Shrestha and Pharsuram Adhikari contributed to methodology design, tool preparation and finalization of manuscript.

COMPETING INTERESTS

All the authors declare no competing interest