

A Study of the Prescription Audit Conducted in a Tertiary Care HospitalPatil S.¹, Rai S.², Padma L.³¹Professor, Department of Pharmacology, Sapthagiri Institute of Medical Sciences & Research Center, Bangalore, Karnataka²Associate Professor, Department of Pharmacology, BGS Medical College and Hospital³Professor & HOD, Department of Pharmacology, Sapthagiri Institute of Medical Sciences & Research Center, Bangalore, Karnataka

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Conflict of interest: Nil

Abstract**Background:** Prescription errors are common medication errors encountered in hospitals. These contribute to irrational drug use which in turn can lead to unsafe treatment, health hazards, economic burden on the patients & wastage of resources**Aim:** (1). To assess the rationality of prescription pattern in a tertiary care hospital. (2). To describe the appropriateness of medical care by measuring the WHO core prescribing indicators.**Materials and Methods:** After obtaining ethical clearance from the IEC, the study was initiated. An observational & non-interventional study was conducted at a tertiary care hospital & prescription forms received at the pharmacy and in the IP areas were recorded. The prescriptions were analysed for compliance and non-compliance with the OPD and IPD prescription details and also for effect of training on non-compliance with various prescription parameters. The study was conducted from April 2022 – May 2024.**Results:** The average compliance in the OPD prescription audit over the 3 years with capital letters, generic names, dose, route, frequency, duration, drug interactions, Doctor's KMC Registration No. was 88%, 87%, 97%, 96%, 98%, 94%, 5%, 93%, 96%, 4% and 4% respectively. The average compliance in the IPD prescription audit over the 2 years with capital letters, generic names, dose, route, frequency, duration, drug interactions, Doctor's KMC Registration No., signature of the doctor, error prone abbreviations, h/o drug allergy, ADR, h/o previous medications was 94%, 92%, 97%, 97%, 97%, 96%, 5%, 96%, 97%, 5%, 5%, 4%, 10% respectively. When the prescriptions were analyzed for non-compliance with various prescription parameters in two groups of doctors with and without training using the Mann-Whitney U test, significant difference was found for compliance with capital letters ($p=0.001$), generic names ($p=0.001$), duration ($p=0.001$), KMC registration no. ($p=0.001$) and doctor's signature ($p=0.035$).**Conclusion:** There was a significant improvement in the compliance with prescription parameters in the OPD prescription audit, especially in the second year of the study. The average compliance with the prescription parameters was also good in the IPD Prescription audit. Training had a significant impact on the compliance with prescription parameters.**Keywords:** Prescription Audit, Compliance To Prescription Details, Rational Drug Use.**DOI:** 10.25258/ijcpr.18.3.209This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Prescription is a written order given by Registered Medical Practitioner to a Pharmacist to prepare and/or dispense medicines for the use by the patient. [1] An ideal prescription should include the complete details of the patient, (full name, age, address, with the patient's hospital number, date of the prescription, and the clinical diagnosis), the medication details including the name of the drug using the generic name, the formulation used with the dose, frequency of administration, total quantity to be supplied, the duration of treatment, and the

details of the prescribing doctor including name, address, registration no. and signature. The prescription is considered invalid if any of the above details is missing. [2] "Rational drug use is defined as the process of appropriate prescribing, and dispensing of drugs for the appropriate patient for diagnosis, prevention, and treatment of diseases." It also includes the WHO's definition: "patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of

time, and at the lowest possible cost to them and their community.” [3] Prescription writing is an important skill which every doctor should develop. The undergraduate and postgraduate medical teaching should inculcate specific training on good prescription writing to avoid prescription errors. [4] Rational use of drugs is an important factor in optimising the quality of health care for both patients and the community as a whole. [2] For effective health care, good quality medicines with their rational use should be both available & affordable. [5]

Medication error is an important factor which contributes to irrational drug use. Amongst the medication errors encountered in hospitals, it is the prescription errors which are very common in clinical practice. The rationality of prescribing pattern is important as it can lead to unsafe treatment, health hazards, economic burden on the patients & wastage of resources. [6]

The assessment of the prescribing pattern through prescription audit allows to monitor, evaluate and if necessary, suggest modifications in the prescribing practices of medical practitioners, with the whole objective to make the medical care rational and cost effective. [7] It is important to not only detect prescription errors but also take appropriate steps to amend them immediately. [7] Therefore prescription audit plays an important role in evaluation & analysis of prescriptions in health care set up.

This institution being a tertiary care hospital, regular prescription audit helps & enables in optimizing rational drug prescription. The aim of this study was to assess the rationality in the prescribing pattern of the doctors in a tertiary care hospital and to describe the appropriateness of medical care by measuring the WHO core prescribing indicators

Materials and Methods

An observational & non-interventional study was conducted at Sathagiri Institute of Medical and Research Centre, Bangalore after obtaining ethical clearance from the IEC& prescription forms received at the pharmacy were recorded and data was analysed.

Also the audit was conducted in IP areas as well. The study was conducted from April 2022 – May 2024. It is an ongoing study. Inclusion criteria:-the prescription forms of outpatient departments received by the pharmacy as well as in the IP areas were included in the study. The selected

prescriptions were analysed for completeness of patient details such as name, age, gender, MRD NO, diagnosis. Also the medications written in the prescriptions were evaluated for

1. Capital letter compliance
2. Drugs written in generic name
3. Dose
4. Frequency
5. Duration
6. Drug drug interactions
7. Registration no of the doctor
8. Signature of the doctor
9. H/O Drug allergy
10. ADRs
11. H/O previous medications

Prescription Audit Analysis:-

Sampling Technique and Calculation of Sample Size:

The Sample Size was calculated by a convenient sampling method[8,9].

1. For Out-Patients:

Approximately 12,000 patients/month

30% of this= 4000 patients/month

2. For In-Patients:

Approximately 7,000 patients/month

30% of this= 2000 patients/month

The data collected will be entered in MS Excel and analysis will be carried out using statistical software called SPSS version 20. The Results will be expressed in the form of Descriptive Statistics like Mean, Standard Deviation, Frequency and graphs wherever required. The effect of training on compliance with the prescription details will be assessed by Mann -Whitney U test

Results

The prescription audit was conducted across three periods: April-December 2022, January-December 2023, and January-May 2024.

A total of 6713 prescriptions were analyzed, the audit reveals significant improvements in prescription compliance from 2022 to 2024. (Table 1) Notably, compliance with capital letter usage, generic name, and KMC registration number of the doctor increased substantially. However, there remains a low compliance rate in documenting drug interactions, error prone abbreviations and history of drug allergy, indicating areas needing further attention. (Fig 2)

Table 1: Frequency and percentage of compliance with OPD prescription parameters

SL. No	OPD Prescription content	Frequency and Percentage of compliance			
		2022 (April-December)	2023 (Jan-Dec)	2024 (Jan-May)	Total
		Number of Prescription (n=900)	Number of Prescription (n=2874)	Number of Prescription (n=2939)	Number of Prescription (n=6713)
		f (%)	f (%)	f (%)	f (%)
1.	Capital letter compliance	533(59.22%)	2642(92%)	2763(94%)	5938(88%)
2.	Generic name	553(61%)	2574(90%)	2709(92%)	5836(87%)
3.	Dose	854(95%)	2777(97%)	2862(97%)	6493(97%)
4.	Route of administration	847(94%)	2768(96%)	2858(97%)	6473(96%)
5.	Frequency	879(98%)	2788(97%)	2881(98%)	6548(98%)
6.	Duration	765(85%)	2738(95%)	2824(96%)	6327(94%)
7.	Drug interactions*	27(3%)	217(8%)	125(4%)	369(5%)
8.	KMC Registration number of the doctor	690(77%)	2700(94%)	2821(96%)	6211(93%)
9.	Signature of the doctor	830(92%)	2726(95%)	2870(98%)	6426(96%)
10.	Abbreviations (error prone)*	0	150(5%)	104(4%)	254(4%)
11.	H/O Drug allergy*	0	194(7%)	99(3%)	293(4%)

*These are the areas of low compliance rate

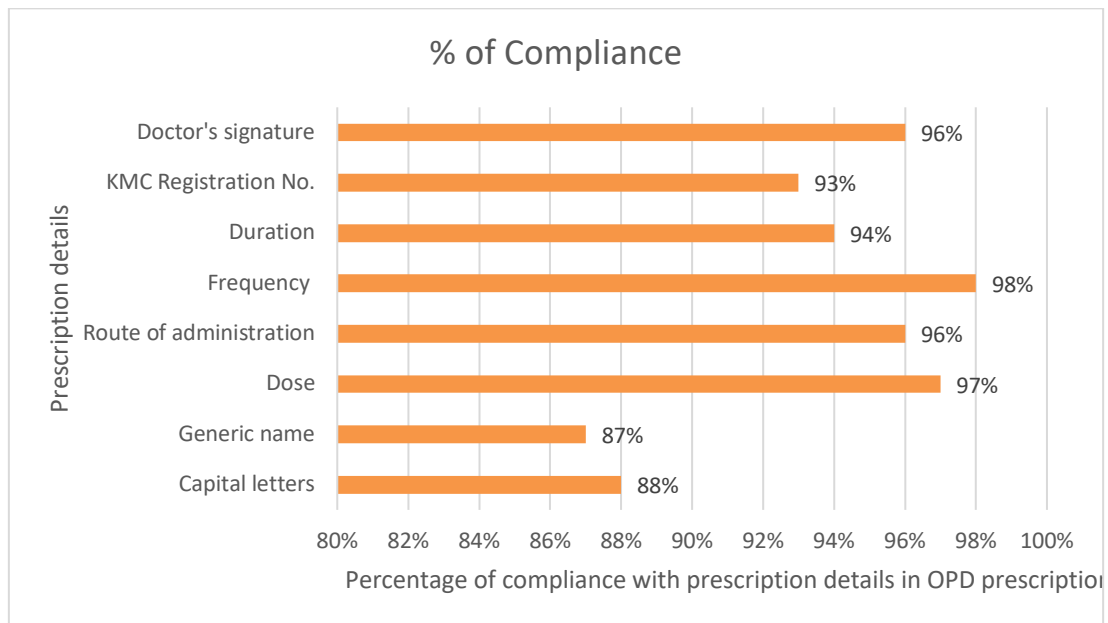


Figure 1: Average percentage of compliance with prescription details in OPD prescriptions

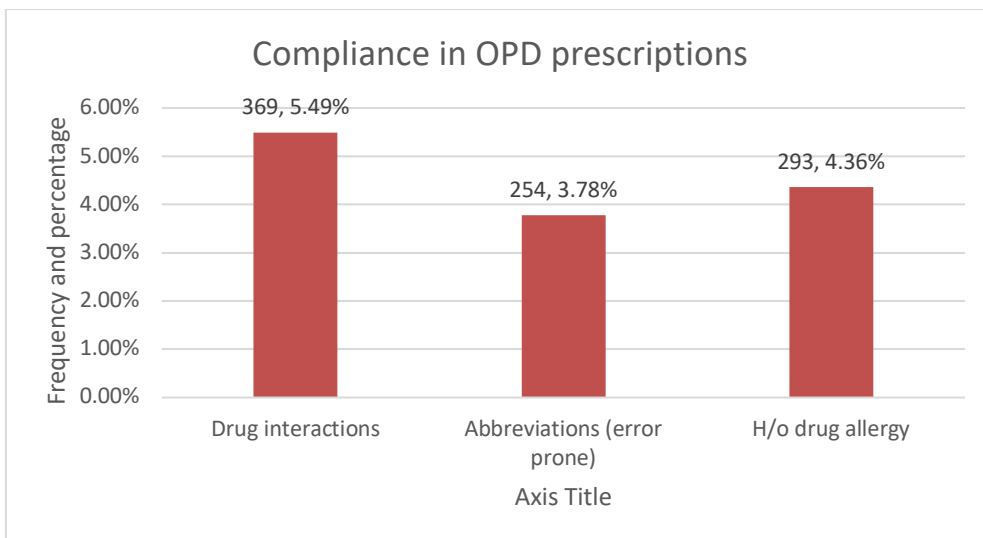


Figure 2: Average percentage of compliance with OPD prescription parameters

The IPD prescription audit was conducted across two periods: January-December 2023 and January-May 2024.

A total of 6023 prescriptions were analysed. The audit reveals significant improvements in IPD prescription compliance from 2023 to 2024. (Table

2) Notably, compliance with capital letter usage, generic name, and KMC registration number of the doctor increased substantially. However, there remains a low compliance rate in documenting drug interactions, error prone abbreviations and history of drug allergy, indicating areas needing further attention (Fig 4)

Table 2: Frequency and percentage of compliance with IPD prescription parameters

S. No.	IPD Prescription content	Frequency and Percentage of compliance		
		2023 (Jan-Dec)	2023 (Jan-Dec)	2023 (Jan-Dec)
		Number of Prescription (n=2427)	Number of Prescription (n=2427)	Number of Prescription (n=2427)
		f(%)	f(%)	f(%)
1.	Capital letter compliance	2209(91%)	3427(95%)	5636(94%)
2.	Generic name	2170(89%)	3351(93%)	5521(92%)
3.	Dose	2328(86%)	3496(97%)	5824(97%)
4.	Route of administration	2346(97%)	3503(97%)	5849(97%)
5.	Frequency	2335(96%)	3527(98%)	5862(97%)
6.	Duration	2295(95%)	3482(97%)	5777(96%)
7.	Drug interactions*	196(8%)	128(4%)	324(5%)
8.	KMC Registration number of the doctor	2289(94%)	3502(97%)	5791(96%)
9.	Signature of the doctor	2305(95%)	3533(98%)	5838(97%)
10.	Abbreviations (error prone)*	146(6%)	131(4%)	277(5%)
11.	H/O Drug allergy*	168(7%)	119(9%)	287(5%)
12.	ADR	105(4%)	116(3%)	221(4%)
13.	H/O previous medications	223(9%)	406(11%)	629(10%)
14.	Name of Antibiotics(route,dose)	0	0	0(0%)

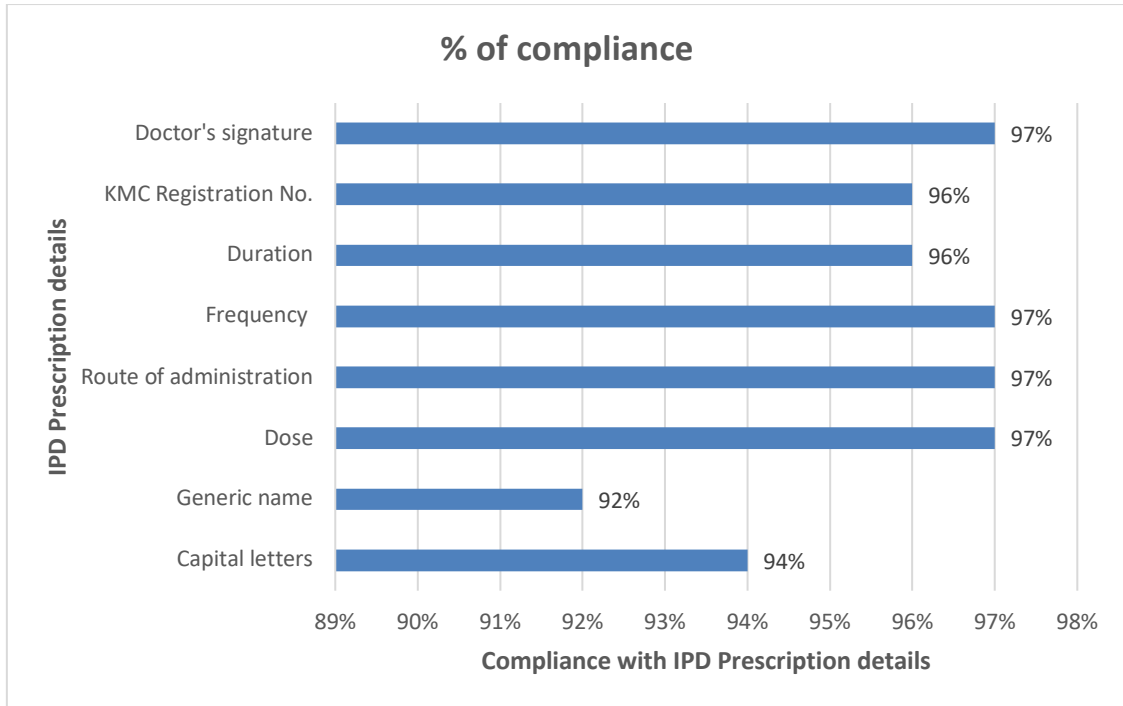


Figure 3: Average percentage of compliance with IPD prescription details

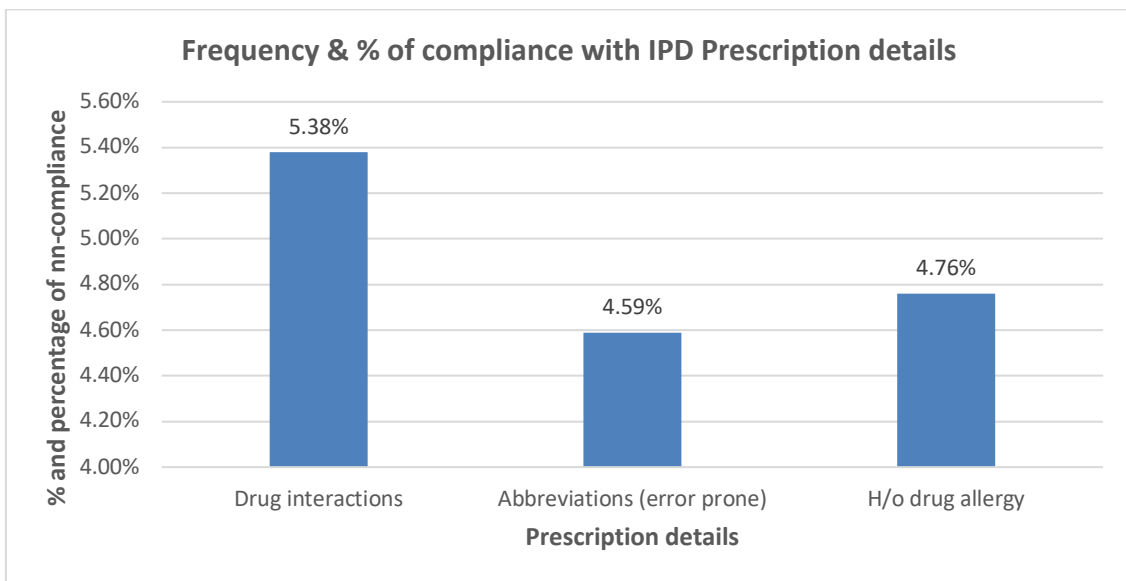


Figure 4: Average percentage of compliance with IPD prescription details

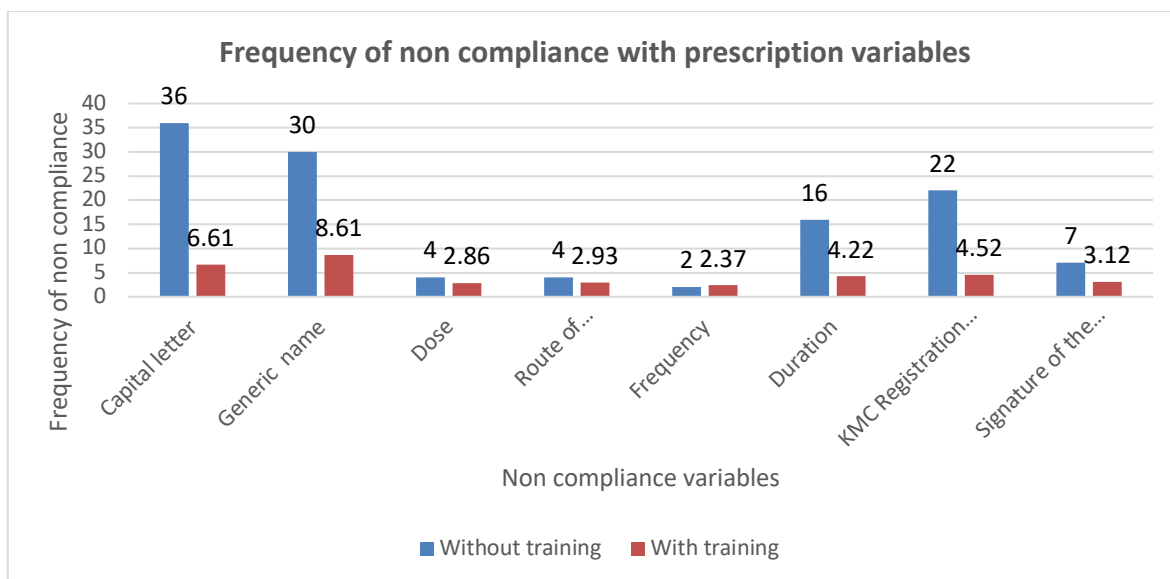


Figure 5: Comparison of frequency of compliance with prescription details with and without training

The Mann-Whitney U test results indicate that training significantly improved compliance in several key areas of OPD prescription writing. (Table 3) Specifically, training had a substantial positive impact on the use of capital letters (IzI = 4.36, p < 0.001), generic names (IzI = 4.21, p < 0.001), duration (IzI = 3.27, p = 0.001), KMC registration number of the doctor (IzI = 4.38, p < 0.001), and the signature of the doctor (IzI = 2.10, p

= 0.035). For these variables, the median values of non-compliance were significantly lower in the group that received training compared to the group that did not, suggesting that the training was effective in reducing prescription errors in these areas. However, no significant differences were found for the dose, route of administration, and frequency, indicating that the training did not have a significant impact on compliance in these aspects.

Table 3: Average percentage of compliance with prescription details with and without training

Sl. No.	Non-compliance variables	Without training		With training		IzI	Sig
		Median	IQR	Median	IQR		
1.	Capital letter	36	28–45	6.61	4–9	4.36	0.000
2.	Generic name	30	22–38	8.61	5–12	4.21	0.000
3.	Dose	4	2–6	2.86	1–4	1.00	0.317
4.	Route of administration	4	1–7	2.93	1–5	1.46	0.143
5.	Frequency	2	1–4	2.37	1–4	0.86	0.394
6.	Duration	16	10–22	4.22	2–7	3.27	0.001
7.	KMC Registration number of the doctor	22	12–32	4.52	2–7	4.38	0.000
8.	Signature of the doctor	7	4–11	3.12	2–7	2.10	0.035

Discussion

On analysis of OPD prescriptions of the current study, it was found that the capital letter compliance drastically increased from 59.22% in 2022 to 92% in 2023 and further to 94% in 2024. Similarly the generic name compliance greatly increased from 61% in 2022 to 90% in 2023 and to 92% in 2024. This is in compliance with the amendments in the Indian Medical Council (IMC) (professional Conduct, Etiquette and Ethics) Regulation 2002, made in 2016, doctors are supposed to prescribe the drug in its generic name and in capitals. [10] In the Singh T et al study and the Antenah AD et al study, generic names were prescribed in 85.8% and 98.7% of the prescriptions

respectively, which is more or less similar to the findings in this study. [11,12]

In this study, the average percentage of the prescriptions where the dose, route, frequency and duration of the drug therapy was mentioned was 97%, 96%, 98% and 94% over the period of 3 years. According to the Naveen A et al study, the drug details were completely mentioned only in 65.5% of the prescriptions.6 This study findings surpasses that of the above study. In the current study, the drug interactions were mentioned in an average of 5% of the prescriptions over the three years.

Compliance with KMC Registration no. increased in 2022 from 77% of the prescriptions to 94% in

2023 and to 96% in 2024, while the average percentage of prescriptions where compliance with doctors' signature was seen was 96%. According to Panayappan L et al study, many of the prescriptions lacked the doctors information, hence more chances to get medication errors. [13] The percentage of prescriptions where error prone abbreviations and history of drug allergy were mentioned in 2022 in minimal prescriptions. This increased to 5% and 7% respectively in 2023 and to 4% and 3% respectively in 2024, in the present study

When the IPD prescriptions were analysed in the present study, compliance with capital letters and generic name increased from 91% and 89% respectively in 2023 to 95% and 93% respectively in 2024. The latter findings are in consonance with those of the Ola AA et al study, where the percentage of drugs prescribed by generic names was $95.4\% \pm 11.4$. [14] The prescriptions which contained the complete drug details in the current study over the period of 2 years was 96% to 97%, while in the Balbir K et al study, the drug details were completely mentioned in only 72.6 % of the prescriptions. [15] In this regard, the current study findings are superior to those seen in Balbir K et al study. In the current study, drug interactions, error prone abbreviations and history of drug allergy were mentioned on an average in 5%, 5% and 5% of the prescriptions respectively over two years, whereas in Ahsaan M et al study, prescription errors like omitting mention of allergy status were quite common. [16]

In the present study, ADRs and history of previous medications were mentioned in an average manner in 4% and 10% of the prescriptions respectively.

Overall, the compliance rates have generally shown a positive trend, reflecting better adherence to prescription guidelines over the analysed periods

When the effectiveness of training in reducing the incidence of non-compliance with various prescription parameters was assessed, non-compliance with capital letters and generic name reduced from median of 36 and 30 before training to median of 6.61 and 8.61 after training. (Table 3) Non-compliance with dose, route, frequency and duration of drug therapy decreased from median of 4, 4, 2 and 16 before training to that of 2.86, 2.93, 2.37 and 4.22 respectively after training. Noncompliance with mentioning of KMC Registration No. and doctor's signature reduced from a median of 22 and 7 before training to that of 4.52 and 3.12 respectively after training

When the effectiveness of training in reducing the incidence of noncompliance with various prescription parameters was assessed, the results obtained suggest that the training program was

effective in improving compliance with several important aspects of prescription writing, thereby potentially enhancing the overall quality and safety of medical prescriptions in the OPD as well as IPD settings.

Conclusion

Aim of the prescription audit is to highlight the discrepancies between actual practice and standard practice, followed by identification of changes that need to improve the quality of care. An audit is a cyclical process to identify the problems, tracing the root cause for the occurrence of the problem followed by the preparation of an action plan to correct the problem. Every time an audit cycle is completed, there should be further improvement in patient care. In the current study, there was quite an improvement in the compliance with prescription parameters over the study period, which was significant after training. Hence this study may be taken as a preamble to other studies involving prescription audit, to conclude that effective training improves the compliance rate with the prescription parameters.

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