

Adherence to Prescription Format and Compliance with Who Core Prescribing Indicators

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Abstract

The study was done to see the prescription format and adherence to WHO core prescribing indicators in the pharmacies surrounding the major hospitals in Lahore. A total of 206 prescriptions were collected randomly from different pharmacies. They were analyzed for their adherence to prescription format and rationality of prescription. Patient & prescribers identifiers were mentioned in most of the prescriptions, superscription was present in 64%, and dose and dosage form was mentioned in 88% and 97% of the prescriptions respectively. Direction for dosage and total amount of drugs to be dispensed was 97% & 45% respectively. Instructions regarding use were present in only 16% of prescriptions. Average no. of drugs per encounter was 3.8 which are more than double of as stated by WHO. Percentage of antibiotics was found to be 41% & that of injectable was 19%. Number of drugs prescribed from NEML of Pakistan were 28.4% and generic prescribing was seen in only 4 prescription out of 206 which came out to be drastically low. The quality of prescriptions, in terms of pattern and of the drugs prescribed, was sub-standard. Adherence to WHO core prescribing indicators was also unsatisfactory.

Keywords: Essential medicines list; Prescription patterns; Rational use of drugs; WHO core prescribing indicators

INTRODUCTION

Prescription writing is a skill as it demonstrates the instructions provided by the physician to the patient. There are no global standards for the prescription writing but World health Organization states that some important things should be written in a prescription so not much can go wrong. These are name and address of the prescriber, with telephone number (if possible), date of the prescription, name and strength of the drug, dosage form and total amount, prescriber's initials or signature, name and address of the patient; age (for children and elderly) & Information for the package label [1].

Patients must 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 cost to them and their community." [2]

In developing as well as in developed countries, inappropriate, futile, and economically ineffective use of drugs occur in health care system. The costs of such irrational drug use are massive in terms of adverse clinical consequences of therapies. Worldwide more than 50% of all medicines are prescribed, dispensed, or sold inappropriately, while 50% of patients fail to take them correctly. Moreover, about one-third of the world's population lacks access to essential medicines [3]. The study was conducted to identify the flaws in prescription patterns to create an awareness regarding the irrational use of drugs by giving the feedback to the physicians.

Main aims and objectives of this study were;

- To check the presence of various components of a standard prescription format, in the prescriptions from different physicians
- To suggest any necessary strategies to minimize errors owing to wrong prescription format
- To suggest a standard prescription format, which needs to be developed by the government authorities and to be implemented

- To evaluate the compliance of physicians towards WHO core prescribing indicators
- To suggest necessary policies to be made in the health care system by the authorities to ensure rational prescribing of drugs
- To suggest the utilization of NEML while prescribing and the concept of generic prescribing
- To measure the degree to which physicians follow the national drug policy
- To measure the level to which antibiotics and injections are being prescribed
- To measure the percentage prescription trends of prescribing drugs by generic name.

MATERIALS AND METHODS

A prospective, descriptive and cross-sectional study was designed and conducted on the data collected from the prescriptions collected from various community pharmacies of Lahore. Permission for collecting the data was taken from managers of all the pharmacies in which the study was conducted.

During the study, 206 prescriptions of ambulatory patients of all categories of diseases and age groups were audited and analyzed. Parameters were evaluated using the snapshots of the prescriptions. The data was collected on the Form 1 (Appendix III).

The components of prescriptions were analyzed separately. Presence of patient identifiers, superscription, inscription, transcription, subscription, and physician identifiers was checked. Apart from this, each prescription was checked for the compliance of the prescribers with WHO core prescribing indicators.

RESULTS AND DISCUSSION

Two parameters were evaluated during this study i.e. adherence to prescription format and compliance with WHO Core Prescribing Indicators. A total of 206

prescriptions, taken from various pharmacies and medical stores were audited.

The results have shown that most of the prescriptions were lacking the important patient demographics. Most of the prescriptions were missing Age, Sex and Address of the patient. Out of 206 prescriptions, 180 prescriptions (87%) were containing the name of the patient. The remaining 26 prescriptions (13%) were missing the patient's identity. Such prescriptions are always a source of serious medication errors like dispensing of medication to any wrong patient. While a study conducted in Andrapradesh, India shows that 100% of the prescriptions were carrying patient's identity^[5]. Age of the patient is important to be mentioned on the prescriptions. This facilitates the selection of correct dose of any drug to be dispensed to any patient and may also help in dispensing of the correct dosage form of the drug. Age of the patient, according to the current study was mentioned in 115 prescriptions (55%). This number is still better than the number found out in the study conducted in Andrapradesh, India, which shows that only 15% of the prescriptions were containing the age of the patient^[5]. While in a study carried out in Karachi, Pakistan, 42% of the prescriptions were containing the age of the patient^[4]. In current study, gender of the patient was mentioned in 88 prescriptions (42%), while it was mentioned on 24.5% prescriptions in the study carried out in Karachi, Pakistan^[4]. An alarmingly low number of the prescriptions were containing the address of the patient, i.e. only in 7 prescriptions (3%) out of the total 206. Although this percentage may be better than that observed by Parvani V. *et al*, who found out that none of the prescriptions contained the address of the patient in Warangal, India^[5]. The trend of mentioning the address of the patient is very low in other areas of Pakistan as well. For example, only 1% of the prescriptions analysed in the study conducted in Dental Teaching Hospitals of Karachi were having the address mentioned on them^[4]. Hence the current shows that there is lack of practice of mentioning the age, gender and address of the patient in the prescriptions in Lahore, Pakistan. Although the name is mentioned on 87% prescriptions, still this number needs to be increased to 100% to avoid any kind of medication errors.

Mentioning superscription is considered important while writing the prescription. Superscription is usually denoted by the sign Rx, or any other sign may also be used for this purpose like "Hu-Wal-Shafi" or any other word as preferred by the physician. In the prescriptions analyzed during this study, 132 prescriptions (64%) out of total 206 were containing this component of the standard prescription. This number is relatively more than that found out in prescriptions analyzed in Karachi, Pakistan, where it was found out to be 61%^[4]. While only 35% of the prescriptions, analyzed in Warangal, India were carrying the superscription^[5]. Another study, conducted in Jaypur, India shows that 100% of the analyzed prescriptions were carrying this component^[6].

Inscription contains names of the drugs to be taken, dose of the drug to be taken by the patient and the dosage form of the drug to be dispensed to or used by the patient. In the

current study, dose of the drug to be taken by the patient was mentioned on 182 prescriptions out of 206, i.e. 88% of the prescriptions. This percentage is higher than that found out in the study conducted in Karachi, Pakistan, which shows that the dose was mentioned in only 77.5% of the prescriptions^[4]. Dosage form of the drug was mentioned in 201 prescriptions, that makes it 97%. This number is near to ideal, and quite higher than that observed in the prescriptions analyzed in Warangal, India, where it was found out to be 74.8%^[5]. While nearly equal percentage of 98.6% was observed in the study, which analysed the prescriptions in Jaypur, India^[6].

Subscription is the next important parameter of the prescriptions that was audited in the current study. This component consists of two parts; directions regarding the dosage, and the total amount of any drug which is to be dispensed. Directions regarding were mentioned on 200 prescriptions that composes about 97%. This number is a healthy amount, although all the prescriptions should carry such directions, so that rational drug utilization by the patient and compliance with the correct dosage schedule can be ensured. Total number of drugs to be dispensed is quite important to be mentioned on the prescriptions. This number is usually mentioned in encircled form after the drug's name and strength to be taken. This component may also be mentioned in terms of the total number of days, for which a prescribed drug is to be taken. This component assists the drugs dispenser to dispense the exact amount of the drug to the patient. This component is quite important to be mentioned in case of such drugs like steroids, narcotics and antibiotics etc., so as to avoid any drug misuse or overuse. In the current study, 45% i.e. 93 prescriptions out of the total 206 were containing this component. Although this percentage is not ideal, but is significantly higher than that observed during the study conducted in Karachi, Pakistan, which shows that only 1% of the prescriptions were carrying this component^[4], but is quite lower than that observed in Jaypur, India, that is 92.66%^[6]. In another study carried out in Jammu by Sharma P. *et al* in 2003, this component was mentioned in 66% of the prescriptions, which is also relatively higher than that observed in current study^[12].

Transcription is the next important component in a standard prescription. This component involves the written instructions regarding the use of drugs. Instructions may be related to time differences between the medication administration and any routine event, or it may also involve any necessary precaution, which is to be kept in mind while taking any medicine. This component was mentioned in 34 prescriptions, which constitute only 16%. Remaining 84% of the prescriptions were devoid of the necessary instructions regarding drug utilization. And such a high avoidance of this component in the routine prescriptions may lead to irrational use of the drugs by the patients. In contrast to this, in India, the study reveals that only 32% of the prescriptions were devoid of such instructions. Although this number is still high, but is quite better in relation to the current study's results^[5].

Prescriber's identifiers include name of the prescriber and the address of the prescriber. In the current study, the name

of the prescriber was stated on 82% of the evaluated prescriptions i.e. 169 out of 206 prescriptions. Whereas according to the study by Aisha W. *et al* in Karachi, Pakistan, physician's name was present in only 1.5% of the prescriptions [4]. So the current study's results show that there is a much better trend of mentioning the physician's name in Lahore as compared to Karachi. Address of the prescriber was mentioned in 190 prescriptions (92%), which is also much better as compared to that found out by Aisha W. *et al* in Karachi [4]. Table 1 summarizes the results of all the parameters discussed above.

Table 1: Parameters to Evaluate Standardization Prescription Pattern

S. No	Parameters to be evaluated	%age observed
1	Name of patient was mentioned	87%
2	Age of patient was mentioned	55%
3	Sex of patient was mentioned	42%
4	Address of patient was mentioned	03%
5	Rx sign was present in prescription	64%
6	Name of drug was mentioned	100%
7	Dose of drug was mentioned	88%
8	Dosage form of drug was mentioned	97%
9	Directions of dosage were given	97%
10	No. of drugs to be dispensed was mentioned	45%
11	Instructions about use were given	16%
12	Name of prescriber was mentioned	82%
13	Address of prescriber was mentioned	92%

Rational drug prescribing is defined as the use of the least number of drugs, to obtain the best possible effects in the shortest period at a reasonable cost [13]. Polypharmacy often leads to a high chances of drug-drug interactions, toxic drug effects and high cost of the treatment. In current study, the average number of the drugs per encounter was found out to be 3.8. This number highly deviates the standard provided by World Health Organization, according to which, the average number of drug per encounter should be between 1.6 and 1.8 [14]. This study reveals similar results as that of the studies conducted in Warangal, Jaypur, and Lucknow in India, in which average number of drugs prescribed per encounter were 3.41 [5], 3.7 [6] and 3.1 [7] respectively. Whereas another study conducted in tertiary hospitals of Nigeria shows that this number was 3.04 [8]. Average number of drugs per encounter was found out to be 1.9 in Ethiopia by Desalegn A. [9], which is quite close to the standard value provided by WHO. So there is a need to decrease the total number of the drugs prescribed, to the extent possible, so as to avoid the poly pharmacy that may lead to increased number of medication errors, increased number of side effects and an increased burden on the patient and the society as a result of increased cost of therapy.

Generic prescribing has several merits as well as demerits. But in case of generic prescribing, the benefits outweigh the losses. So a huge emphasis is laid by WHO on

prescribing of the drugs by their generic name. According to the WHO standards, 100% of the drugs should be prescribed generically. An alarmingly low number of the drugs were mentioned by their generic names. During this study, 6 categories were made to define the extent of generic prescribing. Only 2% of the prescriptions were falling in the category in which generic prescribing was between 1 and 25% of the total prescribed drugs, as shown in **table 2**. A total of 4 drugs out of 792 drugs were stated by their generic names, which constitute only 0.5%. In contrast, the percentage of the drugs prescribed by the generic name in Ethiopia was found out to be 98.7% by Desalegn [9] whereas in Kano, Nigeria, in tertiary health care facilities, the drugs prescribed by generic name was 42.7% [8], while in India, in Jaypur, only 8.33% prescriptions were by generic names [6] and in Lucknow, about 27.1% of the drugs were mentioned by the generic name [7]. Hence according to these stats, the number of drugs prescribed by generic name is very poor as compared to other countries. There is a need to implement the policy of generic prescribing in Pakistan, as it reduces the cost of the drug, both to the patient and pharmacies and also reduces the chances of generic duplication, that may lead to hazardous side effects and drug induced toxicity. This will also help to minimize unethical marketing strategies adopted by some industries.

Irrational use of antibiotics is always associated with a vast number of side effects and emergence of resistant strains of microbes. Antibiotics should be prescribed after culture sensitivity report. And complete course of antibiotic for a particular infection should be ensured. In Pakistan, antibiotics are usually prescribed abundantly and irrationally. In current study, it was observed that 86 prescriptions i.e. 41% of the prescriptions were carrying one or more antibiotic(s) prescribed in them. According to the standard values given by WHO, the number of prescriptions carrying antibiotics prescribed should be between 20.0% and 26.8% [14]. So the value observed during the current study is much more than the standard one. This value was 34.4% according to a study conducted in Nigerian Tertiary Care Hospitals [8], while in India, in different cities, different percentages of antibiotics encounters were seen; in Jaipur, it was as high as 63.33% [6], whereas in Lucknow, it was 20.6 [7]. In an Ethiopian study, this number was found out to be 34.3% [9]. While in Nepal, this number was as low as 18% which is an ideal value [10]. Our study demonstrates that in Lahore, Pakistan, an excessive use of antibiotics is there. This may lead to above stated unwanted circumstances, so there is a need to minimize the prescribing of antibiotics.

Injections need a great care to be employed while administration to the patient. Although injectable formulations have various benefits, but they need expertise and great precautions to be taken while administration. They also increase the cost of therapy and burden on the patient or society. In current study, 40 prescriptions of the 206 (19%) were containing injectable drugs in them. According to WHO standards, 13.4-244.1% of the prescriptions may contain injectable items in them [14]. 13.66% prescriptions were containing injectables according

Jaipur's study in India [6] while in Ethiopia, this number was 38.1 according to Desalegn A. *et al* [9] and in Nepal, 30% of the prescriptions were carrying injectables [10]. This number was very low in Nigeria, i.e. 4%, according to Tamuno I. *et al* [8]. The percentage of injectables prescribed is not higher than the standard limits, so the need is there to maintain the current levels.

Essential Medicine List of any country identifies those drugs, that fulfill the need of maximum number of patients in any country. WHO gives a great emphasis on development of EML, and to follow its concept in true sense. If there is a brief number of drugs that are usually prescribed, it would be easy to maintain and control the full inventory of those drugs. But normally in Pakistan, concept of Essential Medicine List is not usually followed during prescribing. This study reveals that a very small number of the drugs are prescribed from the EML. WHO states that 100 percent of the drugs must be prescribed from the Essential Medicine List of any country [14]. But in the current study 225 drugs out of the total 792 drugs, in 206 prescriptions were prescribed from the Essential Medicine List, which makes it 28.40 %. This number is very low when compared with WHO Standard value, i.e. 100% as well as that found in other countries, such as Jordan, where this percentage was 93% as described by Otoom S. *et al* [11], and Ethiopia, where 96.6% of the drugs are prescribed from EML as per the study of Desalegn [9] and in Nigeria, where this percentage was found to be 94% by Tamuno I. *et al* [8]. In Nepal, 75% of the of the drugs are prescribed from EML as illustrated by Sapkota S. *et al* [10], while in Lucknow India, this percentage was as much as 89% [7]. Number of the drugs, prescribed from EML needs to be increased while prescribing in Pakistan, so as to match the number with the WHO standards. The over-all results of the compliance with the WHO prescribing agents are summarized in table 2.

Table 2: Analysis of WHO Core Prescribing Indicators

S. no.	Indicators	Results	Standard
1	Average number of drugs per encounter	3.1	1.6-1.8
2	Percentage of drugs prescribed by generic name	0.5%	100%
3	Percentage of encounters with an antibiotic prescribed	41%	20%-26.8%
4	Percentage of encounters with an injection prescribed	19%	13.4%-24.1%
5	Percentage of drugs prescribed from essential drugs list or formulary.	28.40%	100%

CONCLUSION

From the current study, we conclude that prescribing practices in Pakistan are not up to the mark, as they are in various other countries. Adherence to the standard prescription format is very poor. Mostly patient demographics, instructions for drug use and prescriber identifiers are missing in the prescription. There is a need for regular refresher courses and training programs during

the service of the physicians and during house-job. Medical students should also be emphasized to learn about writing the prescriptions in a standard way during the course of their degree. There is a need for the regulatory agencies to develop a standard prescription format, and implement it throughout the country. Also it was observed during the study that irrational practices of prescribing the drugs is quite common. There is a poor compliance of the physicians with WHO Core Prescribing Indicators. Irrational prescribing is quite common, that is usually associated with various undesired drug effects, toxicities, tolerances and resistance. Poly-pharmacy is quite common and the concept of generic prescribing is negligible. Excessive use of antibiotics is common, that is leading towards emergence of resistant strains of microbes. Injectable drugs prescription is within the standard limits according to this study. There is a poor trend of prescribing the drugs from NEML. Regulatory agencies should arrange seminars, workshops and regular training programs in order to get the values of these core prescribing indicators within the range of standard values laid by the WHO. Regulations regarding the prescribing of drugs by generic names should be made and strictly implemented. Well established standard treatment guidelines about the prescription of various antibiotics must be developed and full course of any antibiotic must be employed. Strict conditions must be implemented about the prescription and administration of the injectable drugs and their use should be minimised to the extent possible. There is also a need to emphasise the physicians about prescribing the drugs from National Essential Medicine List. Availability of National Formulary and NEML should be ensured in every health institution. By taking all these steps, adherence to the standard prescription pattern and compliance with WHO Cores Prescribing Indicators can be ensured.

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REFERENCES

Guidelines:

- 1 Guide to Good Prescribing by WHO (<http://apps.who.int/medicinedocs/en/d/Jwhozip23e/5.4.html>)
- 2 Promoting Rational Use of Medicines Core Components - WHO Policy Perspectives on Medicines, No. 005, September 2002 (<http://apps.who.int/medicinedocs/en/d/Jh3011e/1.html>)
- 3 Promoting Rational Use of Medicines Core Components - WHO Policy Perspectives on Medicines, No. 005, September 2002

(<http://apps.who.int/medicinedocs/en/d/Jh3011e/2.html>)

Journals:

- 4 Assessing Prescription-Writing Skills of House Officers in Dental Teaching Hospitals of Karachi, Pakistan; Aisha Wali, Anwar Ali, Talha Mufeed Siddiqui, Hamza Jafri; http://www.jaypeejournals.com/eJournals/ShowText.aspx?ID=4056&Type=FREE&TYP=TOP&IN=_eJournals/images/JPLOGO.gif&IID=320&isPDF=YES
- 5 Study of Prescribing Pattern for Evaluation of Rational Drug Therapy in Warangal; Pavani V, Mihir. Y. P, Shravani K, Prabhakar R V; St. Peters Institute of Pharmaceutical Sciences, Vidyanagar, Hanamkonda, Warangal, Andhra Pradesh-506001, India; Link <http://ijopp.org/Oct%20-%20Dec,%202011/77-79.pdf>
- 6 Assessment of prescription pattern in a private teaching hospital in India; Shipra Jain, Zafar Yab Khan, Purna Upadhyaya* and Kumar Abhijeet; Department of Pharmacology, Mahatma Gandhi Medical College & Hospital, Jaipur, India <http://ijps.aizeonpublishers.net/content/2013/3/ijps219-222.pdf>
- 7 Assessment of prescription pattern at the public health facilities of Lucknow district; Ranjeeta Kumari, M.Z. Idris, Vidya Bhushan, Anish Khanna, Monika Agrawal, and Shivendra Kumar Singh; <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3025139>
- 8 Drug Prescription Pattern in a Nigerian Tertiary Hospital; Igbiks Tamuno and Joseph O Fadare; Department of Pharmacology, Faculty of Medicine, Bayero University, Kano, Nigeria & Department of Internal Medicine, Federal Medical Centre, Ido-Ekiti, Nigeria(http://www.researchgate.net/publication/235093582_Drug_Prescription_Pattern_in_a_Nigerian_Tertiary_Hospital)
- 9 Assessment of drug use pattern using WHO prescribing indicators at Hawassa University teaching and referral hospital, south Ethiopia a cross-sectional study; Anteneh Assefa Desalegn, Pharmacology Unit, School of Medicine, Hawassa University, Hawassa, Ethiopia; <http://www.biomedcentral.com/1472-6963/13/170>
- 10 DRUG PRESCRIBING PATTERN AND PRESCRIPTION ERROR IN ELDERLY A RETROSPECTIVE STUDY OF INPATIENT RECORD; SUJATA SAPKOTA, NAWIN PUDASAINI, CHANDAN SINGH, SAGAR GC; Department of Pharmacy, Kathmandu University, Kavre, Nepal; (<http://www.ajpcr.com/Vol4Issue3/450.pdf>)
- 11 Evaluation of drug use in Jordan using WHO prescribing indicator ; Otoom S, Batieha A, Hadidi H, Hasan M, Al-Saudi K (<http://europepmc.org/abstract/MED/15603035/reload=2;jsessionid=p9npHB1rbioL3jBNHD4o.56>)
- 12 Sharma P, Kapoor B. (2003). Study of Prescribing Pattern for Rational Drug Therapy. J K Sci. 5(3)107-109
- 13 Shankar P R, Upadhyay D K, & Subish P, et al., Drug utilisation among older inpatients in a teaching hospital in Western Nepal , Singapore Med J, 2010; 51(1) 28
- 14 The development of standard values for the WHO drug use prescribing indicators http://archives.who.int/icium/icium1997/posters/1a2_txt.html