

Evaluation of Prescribing Pattern in Mirpur Azad Kashmir using who Prescribing Indicators

Aimen Qaiser ^a

Zahra Hassan Kiani ^b

Farina Abid ^c

Tania Pervaiz ^d

Zafar Iqbal ^e

Abstract

Promotion of rational use of drugs in developing countries is necessary for improving the quality of life. Therefore, evaluation of drug use pattern using World Health Organization (WHO) indicators is necessary for assessment of rational use of drugs. 200 prescriptions were randomly collected from different pharmacies in Mirpur and evaluated to measure prescribing indicators. Data was analyzed using SPSS (version 25). Average count of drugs prescribed per prescription was 3.8 (S. D+ 2.01). Percentage of antibiotics prescribed, and injections prescribed per prescription was 42% (n=84) and 16% (n=32) respectively. The percentage of drugs prescribed from Essential Drugs List was 90.5%. It was concluded that prescribing pattern was far away from the standard WHO requirements. Greater number of drugs and overuse of antibiotics focused on close monitoring and regulation of prescribing pattern. Steps should be taken to encourage the rational use of drugs to improve the quality of life

Key Words: Polypharmacy, Prescribing Indicator, Prescription, Rational Prescribing, Rational use of Drugs, Mirpur

List of Abbreviations

WHO	World Health Organization
EDL	Essential Drug List
SD	Standard deviation
NEML	National Essential Medicine List
AJK	Azad Jammu Kashmir

Introduction

Prescription of the drugs is described as an art and science of conveying the information from the healthcare providers to patients (Asghar, Mumtaz, Niaz, Zaheer, & Raza, 2017). Appropriate medicine use is necessary for the provision of better medical care and health to the people. For rational use of drugs WHO inferred that patients should receive medications in doses that are suitable for their clinical

needs, fulfilling their own individual needs for a reasonable duration of time and are available to them and the community at lowest cost (Akl, El Mahalli, Elkahky, & Salem, 2014). Rational prescribing refers to the administration of correct drug to the right patient in proper dose and dosage form at accurate time with precise information and reasonable cost (Prakash, Nadig, & Nayak, 2016).

^a M.Phil Scholar, Department of Pharmacy, Faculty of Biological Sciences, Quaid-i-Azam University, Islamabad, Pakistan.

^b MBBS Candidate, Rawalpindi Medical University, Rawalpindi, Punjab, Pakistan.

^c Pharmacist, Akson College of Pharmacy, Mirpur Azad Kashmir, Pakistan.

^d Pharmacist, Akson College of Pharmacy, Mirpur Azad Kashmir, Pakistan.

^e Director, Drug Testing Laboratories, Mirpur Azad Kashmir, Pakistan. Email: Zafariqbal88@gmail.com

Irrational drug use is causing patients to lose faith in healthcare systems. Due to the lack of well-organized drug policy and limited resources, irrational medicine use has increased in developing countries like Pakistan (Atif, Azeem, et al., 2016; Atif, Sarwar, et al., 2016).

Irrational use of drugs can occur by many ways like over use of medicines (polypharmacy), inadequate dose of medicine, incorrect use of antibiotics, over use of injection when oral medication can be more a suitable, prescribing inappropriate medicines and self-medication (Akl et al., 2014). Moreover, there are number of factors influencing the irrational prescribing, like physicians, patients, drug supply system, working environment, profit goals from selling the medicines and drug information and its misinformation (Abdo-Rabbo, Haaijer-Ruskamp, & Basharahil, 2000; Van der Geest, Hardon, & Whyte, 1990). These malpractices are followed by the new comers and the cycle goes on. Therefore, it is a big challenge to change the ongoing prescribing practices (Desalegn, 2013; Tsega & Makonnen, 2012)

Irrational drug use is a worldwide issue. Irrational use of drug can result in high morbidity and mortality rates in clinical practice (Atif et al., 2018). As per the World Bank, 20 to 50% of the expense of the healthcare is used up on medicines in developing countries. In developed countries 10% to 20% of the health budget is consumed on medicines while 20% to 40% of health budget is spent on medicines in developing countries. Studies have revealed that greater than half of the worldwide drugs are prescribed inaccurately and almost 50% of the

patients are not able to use the drugs correctly (Atif, Sarwar, et al., 2016). Irrational prescribing leads to ineffective treatment, aggravation of the disease, harm to the patients and high costs (Atif, Sarwar, et al., 2016; Desalegn, 2013).

Problems associated with inappropriate use of drugs can be identified by periodic investigation of prescribing pattern (Asgar et al., 2017). The important step in reducing the irrational medicines use is to measure it quantitatively. In 1990s, a set of indicators were established by WHO along with International Network for Rational Use of Drugs (INRUD) to ascertain the working of health care systems. These core indicators are standardized indicators, require no national adaptation and can be used in any drug use study. These indicators serve as a tool for quick and reliable evaluation of critical aspects in a healthcare setting particularly in developing areas where they serve as first line indicators (Basger, Chen, & Moles, 2008). One of these core indicators are prescribing indicators that are used to measure performance of the health care professionals associated with the appropriate drug use. Prescribing indicators are formed on the basis of the prescribing practices perceived in the clinical encounters held in the health care facilities. There are five prescribing indicators i.e. average drug number per prescription, percentage of drugs prescribed by generic name, percentage of antibiotics per encounter, percentage of injections per encounter and percentage of drugs prescribed from essential drugs list (Organization, 1993). Standard values of these indicators are given in Table 1 (Ofori-Asenso, 2016).

Table 1. WHO Standard Values for Prescribing Indicator

Prescribing indicators	WHO Standard Values
Average number of drugs per prescription	<2
Percentage of antibiotics prescribed per prescription	<30%
Percentage of injections prescription per encounter	<20%
Percentage of drugs prescribed from EDL	100%

These indicators aid in assessing the prescribing patterns in health care settings and rational and irrational use of drugs. These indicators also help in delivery of cost effective prescribing which is a vital component for the “effective delivery of appropriate healthcare” (McCull, Roderick, & Gabbay, 1997). However, prescribing indicators have certain limitations. They are fairly considerable in specialist outpatient and inpatient facilities having complex

patterns of medicine use. Method of data collection and seasonal variations also affect the prescribing indicators (Ghei, 1995; Yin et al., 2013)

Many studies have been conducted assessing the rational use of medicines using WHO core indicators. A survey conducted in private and public hospitals of Karachi, Pakistan investigating the prescribing behavior deduced that irrational prescribing was prevalent in the region indicated by increased average

count of prescribed medicines per prescription, high percentage of antibiotics and injections use (Asghar et al., 2017). However, another study conducted in another city of Pakistan, showed good signs of rational drug use pattern in primary health care center of Bahawalpur, Pakistan (Atif, Sarwar, et al., 2016). In Pakistan there is minimal or no check on the prescribing patterns and thus, this has led to the undesirable use of drugs and ultimately patients have to suffer (Akl et al., 2014; Atif, Azeem, et al., 2016).

The aim of study is to evaluate the rational use of drugs in Mirpur by using WHO prescribing indicators to check out health care providers performance regarding appropriate drug use by calculating average count of drugs per encounter, percentage of prescriptions with an antibiotic prescribed, percentage of prescriptions with an injection prescribed and percentage of drugs prescribed from essential drugs list or formulary.

Material and Methods

Study Design

A descriptive cross-sectional study with quantitative approach was designed to evaluate the prescribing pattern.

Study Setting

The study was conducted in District Mirpur, AJK. Three different out-patient pharmacies located in the city Mirpur were selected.

Study Duration

Study was conducted for a period of three months from November 2018 to January 2019.

Sample size

A sample of 200 prescriptions was included by convenient sampling technique.

Data Collection

Data on prescribing indicators was obtained from the prescriptions collected from different pharmacies in Mirpur. The data required to measure the prescribing indicators for each patient encounter was directly entered into the prescribing indicator form (Annex 1) prepared for measuring the prescribing indicators.

Inclusion: Encounters occurring at the outpatient health facility during the period from November 2018 to January 2019 were included.

Data Analysis

After collection of the data, all the data were manually evaluated and then analyzed using the Microsoft Excel.

Ethical Consideration

Although there was no ethical issue in our study however, all the participants were asked for their verbal consent and they were made assure that data will be kept confidential.

Results

Total 200 prescriptions from the patients were collected. The average count of drugs prescribed was 3.8 (STD±2.104). 8.5% of prescriptions had only one drug while 0.5% prescriptions comprised of maximum thirteen drugs. Maximum three drugs were prescribed in 25% of prescriptions (Figure 1). Average count of antibiotics prescribed was observed to be 0.5 (SD ±0.6872 min.0, max. 4). Figure 2 revealed that in 42% (n=84, STD ± 0.68 min 0, max 4) prescriptions antibiotics were prescribed. The average injection count prescribed was calculated to be 0.23 (STD ±0.66 min. 0, max. 5). 84% (168) prescriptions had no injection prescribed while in 0.5% (1) prescription five injections were prescribed. The average count of drugs from essential drug list was 2.045 (STD±1.342 min.0 max 8).90.5 % (81) prescriptions had drugs mentioned from the essential drugs list whereas, in 9.5 % (19) prescriptions no drug was prescribed from EDL.

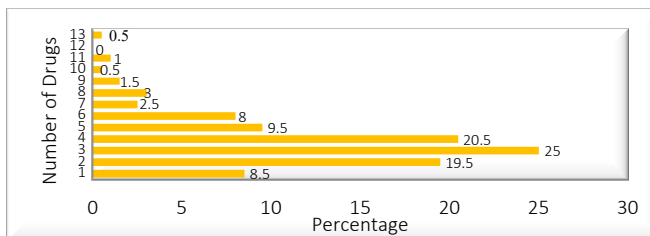


Figure 1: Number of Drugs prescribed per Prescription.

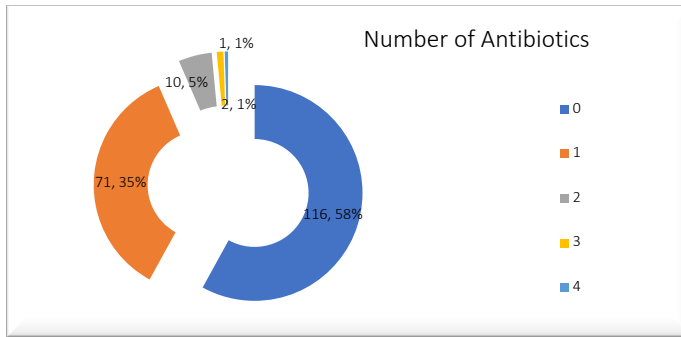


Figure 2: Number and Percentage of Antibiotics Prescribed per Prescription

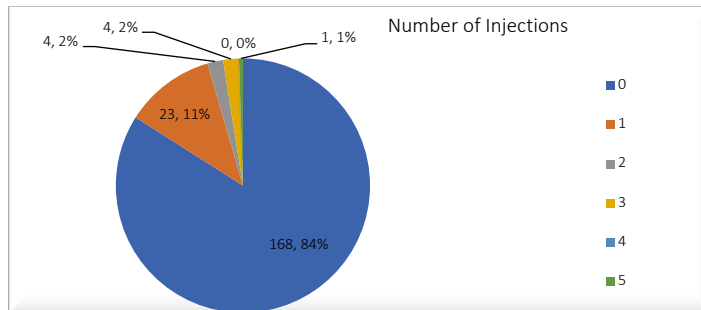


Figure 3: Number and Percentage of Injections Prescribed per Prescription

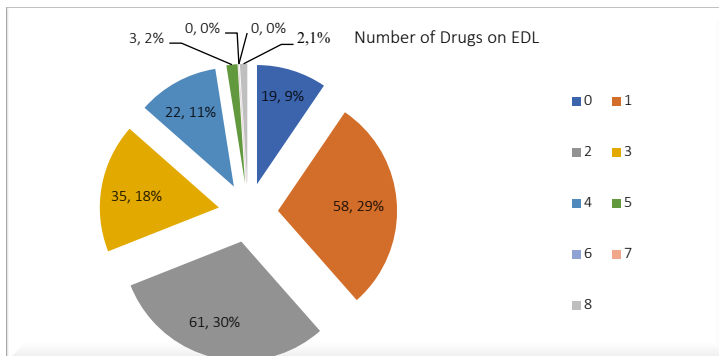


Figure 4: Number and Percentage of Drugs Prescribed from Essential Drugs List

Discussion

Irrational drug use is a worldwide complication and causes severe harm to patients, therefore, to assess the irrational prescribing pattern a descriptive cross-sectional study was conducted using the well-established WHO prescribing indicators. This study could help in continuously monitoring the prescribing behavior of health care professionals and serve as a base for future improvements.

Total 760 drugs were prescribed on 200 prescriptions. The average number of medicines prescribed per encounter was 3.8 (STD \pm 2.105 min. 1 and max. 13). These observations were quite close to the observations of *Muhammad Atif et al* who observed the drug prescription pattern using WHO methodology by the sample of 1000 patient's prescription at primary health care center Bahawalpur, Pakistan. Per encounter the average

count of drugs was 3.4 and 3.5 in 2015 and 2016 respectively (Atif, Azeem, et al., 2016; Atif, Sarwar, et al., 2016). M. A. Asghar *et al* evaluated the prescribing pattern of doctors in private and public hospitals in Karachi (Pakistan) using WHO indicators. 120,096 prescriptions were gathered from four private and four public hospitals and evaluated for the rational drug use. The average count of drugs per encounter in private and public hospitals was 5.4 and 7.14 respectively. These results demonstrated that the prescribing behavior of physicians in private hospitals was more appropriate and rational as compared to that in the public hospitals (Asghar et al., 2017). A study conducted in Department of tertiary care hospital in Bangalore, India on prescribing among anemic patients exhibited that average count of medicines prescribed was 5.5 (Bhat, Koonisetty, & Saraswathy, 2018). In a study carried out in private and public healthcare facilities of Indonesia, average count of drugs per encounter was 3.06 and 3.31 in private and public healthcare facilities respectively (Yuniar, Susyanty, & Sari, 2017). These studies revealed that average count of drugs was higher in Pakistan, India and Indonesia than the standard value of <2 suggested by WHO. While the clinical practices in Ethiopia, Brazil, Nepal, Jordan, China, Saudi Arabia and Egypt complied with the WHO standards with average count of medicines per prescription of 2.1, 2.2, 2.28, 2.3, 2.36, 2.4 and 2.5 respectively (Akl et al., 2014; Dong, Yan, & Wang, 2011; El Mahalli, 2012; Ferreira et al., 2013; James, Handu, Al Khaja, Otoom, & Sequeira, 2006; Leniisa & Fereja, 2014; Pradhan & Mathur, 2016). Increased drugs number in a prescription, due to incompetency of the physician, unavailability of correct therapeutic drug or lack of appropriate guidelines can adversely affect the patients.

84 prescriptions of 200 contained antibiotics. Percentage of antibiotics per prescription was 42% (optimal range <30%). This value was almost same to the percentage of antibiotics prescribed (42.8%) in a study performed by Yuyun Yuniar *et al* in private and public health care facilities in Java Island, Indonesia (Yuniar et al., 2017). M.A. Asghar *et al* assessed that 67.94% antibiotics were prescribed in public hospitals and 51.59% antibiotics were prescribed in private hospitals in Karachi, Pakistan (Asghar et al., 2017). Percentage of antibiotics per encounter was also high in Nepal (28.61%) (Pradhan & Mathur, 2016), Saudi Arabia (32.2%) (El Mahalli, 2012), India (37%), Africa (46.8%) (Ofori-Asenso, Brhlikova, & Pollock, 2016), Jordan (60.9%) (James et

al., 2006) and Kabul, Afghanistan (66%) (Mousavi, Roien, & Ramozi, 2018). High percentage of antibiotic prescription can lead to adverse drug reactions (ADRs) and antibiotic resistance. N.J. Raju *et al* conducted a study in South west Ethiopia and they found out that the percentage of antibiotics per prescription (25.71%) was within the optimal range (Angamo, Wabe, & Raju, 2011), while in a study held in Brazil 2.5% antibiotics were prescribed (Ferreira et al., 2013). The prescription pattern was evaluated using WHO core drug use indicator at Medical Outpatient Pharmacy of Hawassa University Teaching and Referral Hospital. 1290 prescriptions were evaluated retrospectively. The percentage of antibiotic prescribed came out to be 58.1%. Mostly prescribed antibiotics were chloramphenicol (11.6%), gentamicin (14.9%), ampicillin (15%) and amoxicillin (16.4%). According to the findings of this study prescribing practices showed deviation from WHO recommended standards. This study emphasized the need to regulate and monitor antibiotics prescribing by drug use evaluation (Desalegn, 2013).

Another finding of the study was percentage of injections per prescription (16%) which was within the optimal range of <20% which indicated rational use of injections. Muhammad Azeem *et al* evaluated the prescriptions in private practices and results of their study showed that 19% injection were prescribed which was very close to the value of calculated in our study (Atif, Azeem, et al., 2016). 13.1% and 22.93% injections were prescribed in Brazil and China respectively (Dong et al., 2011; Ferreira et al., 2013). A very low percentage of injection prescriptions was reported in Nepal (0.61%) (Pradhan & Mathur, 2016), Saudi Arabia (2%) (El Mahalli, 2012) and Indonesia (2.2%) (Yuniar et al., 2017). An excessive use of injectables may increase the risk of blood borne diseases (Gostin, 1998). A study conducted in clinics in ten provinces of Western China investigating the prescribing pattern revealed an irrational use of medicines as indicated by high percentage of injections per encounter (Dong et al., 2011). In another study held by M.A. Asghar *et al* in private and public hospitals in Karachi 67.94% injections in public hospitals and 64.36% injections in private hospitals were prescribed, these value were beyond the optimal range manifesting an irrational use of injections (Asghar et al., 2017).

One of the findings of the study, percentage of medicines prescribed from the national essential medicines list (NEML 2018) was 90.5% that was close the optimal value of 100%. This finding was almost

similar to that as found by *Muhammad Atif et al* who assessed the prescriptions at primary health care centers in Bahawalpur. 93.4% drugs were prescribed from essential drug list in their study ([Atif, Azeem, et al., 2016](#)). A study performed in private hospitals and public hospitals of Karachi revealed that 84.64% drugs in public hospitals and 94.42% drugs in private hospitals were prescribed from NEML ([Asghar et al., 2017](#)). Drug percentage directed from essential drugs list was reported to be 88% in Africa, 89.4% in Indonesia, 93% in Jordan and 99.2% in Saudi Arabia which demonstrated that maximum drugs were prescribed from the NEML in these countries following the WHO prescribing standards. Rational prescribing requires prescribing from the essential drugs list as these drugs are safe, cost effective and easily available. A very low percentage (23.42%) of medicines was reported to be advised from essential drug list in a study conducted at dermatological outpatients in Nepal indicating irrational use of medicines ([Pradhan & Mathur, 2016](#)). Chandelkar and his co-workers evaluated a sample of 1000 prescriptions in Goa, India and reported that almost all medicines prescribed were from essential medicines list ([Chandelkar & Rataboli, 2014](#)). On the other hand, 50% of medicines were discovered to be dictated from EDL in a study performed in Bangalore, India evaluating prescribing behavior among anemic patients ([Bhat et al., 2018](#)). Investigation of prescribing patterns in healthcare facilities of China revealed that 67.70% of medicines were advised from essential medicines list ([Dong et al., 2011](#)) while 73.7% drugs

were reported to be mentioned from essential drug list in a survey conducted in primary healthcare centers in Brail ([Ferreira et al., 2013](#)).

Conclusion

This study was conducted to evaluate the prescribing indicators in order to assess the prescribing behaviour of health care professionals in Mirpur. The prescribing indicators were not within the optimal range except the percentage of injections per prescription. The high degree of prescription of drugs among patients showed polypharmacy which endangers quality of life bringing harm and suffering. Deviation of the antibiotics from the standard WHO requirements require close monitoring of this costly and most commonly overdosed drug therapy form as overuse of antibiotics leads to antibiotic resistance which is a critical issue. Drugs prescribed from EDL were also below the optimal value. The prescribing exercises are far away from the standard WHO requirements illustrating irrational use of drugs. Steps should be taken to encourage rational prescribing according to the prescribing standards of WHO. Various ways shall be adopted to promote rational use of drugs like organization of seminars, workshops, conferences, establishment of drug information centres, committees, use of essential drugs list, standard treatment guidelines, and continuing education to keep the knowledge up to date. Implementation of these ways will definitely lead to a high-quality life.

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