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Research Paper

Prescribing practices at a secondary healthcare setting of Islamabad, Pakistan: a descriptive cross-sectional study

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Abstract

Objectives Irrational drug utilization is one of the key factors behind therapeutic failure, the emergence of antibiotic resistance, and a high incidence of adverse effects worldwide. This study was designed to assess drug use patterns, based on World Health Organization (WHO)/INRUD core drug use indicators and some additional parameters, in the secondary healthcare hospital of Islamabad, Pakistan.

Methods The outpatient department (OPD) of the healthcare facility was randomly visited from December 2019 to March 2020 to prospectively collect data from the prescriptions and conduct patient interviews. A total of 2290 prescriptions were included in this study. The data analysis was done through SPSS software v23.0.

Key findings The average number of drugs prescribed per encounter was 3.37. Polypharmacy was positively correlated with the age of the patients. Only 4.8% of the drugs were prescribed by generic name. There was frequent (41.5%) use of antibodies. However, the proportion of injectable drugs (12.3%) was within the optimum limit. Essential components of a prescription notably diagnosis, dosage form, method of administration, and duration of therapy were frequently missing. 87% of the prescribed drugs were from the National Essential Medicines List. 80% of the total prescribed drugs were available in the hospital pharmacy. Only 30% of the patients had correct dosage information, while only 20% of the drugs were correctly labelled.

Conclusion This study suggests frequent non-compliant prescribing practices including polypharmacy, use of a brand name, antibiotics overuse, compromised legibility and completeness of prescription and inadequate patient counselling and drug labelling, in the secondary healthcare hospital of Islamabad, Pakistan.

Keywords: prescribing practices; secondary healthcare setting; WHO/INRUD core drug use indicators; Pakistan

Introduction

Drug use is a complex system that works among prescribers, dispensers and patients. Inappropriate drug use is a driving force behind therapeutic failure, the emergence of antibiotic resistance and high incidence of adverse effects in developing countries.[1] This practice may also increase healthcare cost and wastage of resources. The irrational practices in drug use commonly include prescribing too many medicines per patient, the use of broad-spectrum antibiotic or their use for nonbacterial infections, use of injections in conditions where oral formulations would be more appropriate and failure of adherence to clinical guidelines while prescribing the medicines.[2, 3] Adopting rational prescribing practices, which require that patients receive medications appropriate to their clinical needs, in doses that meet their requirements, for an adequate period, and at the lowest cost to them and their community, will help to maximize the benefits of therapy and promote human wellbeing.[4]

The prescription is a means of implementing therapeutic plans. It is a written order from a prescriber to the dispenser on how the medicine should be dispensed, as well as, constitutes instructions to the patients about appropriate drug utilization on treatment or prophylaxes. Irrational prescribing is recognized globally as a major health concern.[5] WHO has set the indicators to assess the quality of pharmaceutical care provided by a health care facility. These indicators are categories into three major groups including prescribing indicators, patient indicators and facility indicators.[2] It has been revealed that, in developing countries, where one-third of the population has limited access to essential medicines, approximately 50% of the patients take wrong medicine mainly due to the incorrect way of prescribing and dispensing, which is the waste of already limited resources.[6] It is also revealed that substandard prescribing practices can lead to therapeutic failure, disease exacerbation or prolongation, drug toxicity, financial losses, and loss of patient confidence.[4]

The healthcare delivery system of Pakistan consists of three levels of healthcare services: primary, secondary, and tertiary.[7] The primary level of healthcare, working through Basic Health Units and Rural Health Centres, provides preventive, curative healthcare, referral, and minimum inpatient services to a catchment population of up to 25 000-100 000 individuals mainly in the rural areas. Secondary healthcare is an intermediate level of healthcare set up in Pakistan that works through tehsil and district level hospitals. These hospitals, with both outdoor and inpatient departments, provide technical, therapeutic and diagnostic services for 0.5 to 3 million population. The tertiary Healthcare hospitals provide more specialized inpatient care and also attend referrals from primary or secondary health centres.[8] As primary health care facilities are inadequate to meet health care needs and their referral system is poorly functioning, about 44% of the population attend secondary and tertiary health care facilities for basic health care.[9]

Irrational drug use also seems a problem of paramount intensity in Pakistan. An analysis of the prescribing indicators by previous studies on the healthcare system of Pakistan suggests the existence of widespread inappropriate prescription practices in the country.[1, 10–12] Common prescribing errors as reported from Pakistan include polypharmacy, unjustified use of analgesics, antibiotics, multivitamins and injections, prescribing non-essential drugs, ignoring drug–drug interactions and incomplete and poor legibility of the prescription. Unavailability of the essential drugs, which are known to be the backbone of rational prescribing, and approximately fifty thousand registered drugs, highly contribute to irrational prescribing in Pakistan.[10] To reduce the incidence of poor prescribing practices, the assessment and reporting of drug use patterns in healthcare facilities are required to be conducted regularly so that remedial actions/interventions could be taken at all levels. Although a few well-designed studies have been conducted on primary healthcare centres of Sindh, Khyber Pakhtunkhwa and Punjab,[12, 13] report on prescription trends at the level of secondary and tertiary care facilities is scarce. A limited number of reports from teaching/tertiary care level hospitals, mostly based on a few WHO-recommended drug use indicators, have suggested that improper practices are also prevailing at a higher level of healthcare settings in Pakistan.[1, 14, 15]

As previous reports evaluating the WHO prescribing indicators are scarce at tertiary care levels and there are no reports from secondary care hospitals, this study was designed to assess the prescribing practices in the OPD of a public sector secondary healthcare hospital in Islamabad to get a broad picture of the prescribing practices prevailing in a bigger healthcare setting of Pakistan.

Methods

Study setting

This cross-sectional hospital-based study was carried out in a secondary health care hospital, located in Islamabad, Pakistan. This 200-bed hospital is annually serving 200 000 patients of Islamabad and Rawalpindi cities in outdoor, indoor and emergency departments. Data were collected from four out of five outpatient departments of the hospital including medical, surgical, gynaecology and cardiology.

Sampling and sample size

The sampling unit was ambulatory patient encounters of any age visiting the facility and willing to share the information. As WHO has recommended to include at least 600 encounters in a cross-sectional survey or more, if possible, a total of 2500 prescription encounters were recorded.[2] The healthcare facility was randomly visited for three months (December 2018 to February 2019) to collect data for WHO core drug utilization indicators from willing patients.

Data collection

Immediately after the patient encounter with the prescribing physicians in outdoor departments, the prescriptions were scrutinized and the data for the WHO prescribing indicators were recorded on structure forms by data collectors already trained by an extensive two days' workshop on the methodology recommended by the international network of rational use of the drug.[3] The prescribed drugs were evaluated against National Essential Medicines List (NEML), 2018, to determine the frequency of essential drugs within those prescribed.[16] The patients were requested to meet again after they have been collected the prescribed drugs from the hospital pharmacy to record patient are indicators including the drugs the patient has received from the hospital pharmacy and whether the drugs had been adequately labelled. Lastly, the patient's knowledge of the dose of each drug including the quantity of the drug to be administered and timing of administration was evaluated and as a compensation to the patient and in fulfilment of moral and professional responsibility, the correct information about the drug dose and administration was furnished to the patients who were lacking the correct knowledge. Average consultation time was determined by dividing the time span from entry to the exit of the patient by the total number of consultations. Average dispensing time was calculated by dividing the entire time of dispensing by the number of patients visited.

Data pertaining to the facility indicators was collected at the end of this study. This information about the availability of the essential drug list/hospital formulary and WHO specified key drugs for common illnesses was obtained from duty staff nurses of the outpatient departments and hospital pharmacy department, respectively. Additional data related to completeness of the information given in the prescription, the drug formulations being prescribed, and names and pharmacological classes of the drugs prescribed were also collected for the prescriptions. The completeness of the prescriptions was assessed using parameters including prescriber's identification and signature, patient's name, date, drug name, strength, dose, dosage form, frequency/dose interval, duration of use, directions for taking the drug; diagnosis/indication of prescribed drugs.

Ethical considerations and data analysis

Ethical approval was granted by the Ethics Committee, Capital University of Science and Technology, Islamabad. Ethical approval was also taken from the Ethics Committee of the secondary health care facility.

The data were analysed using SPSS v23.0 (IBM Corporation, Armonk, NY, USA). Descriptive statistics (frequencies and percentages) were performed for the categorical variables, whereas, mean with standard deviation are computed for the continuous variables.

Results

Of the total 2500 prescriptions prospectively collected, 210 prescriptions were excluded from the study due to poor legibility and the data were recorded from the remaining 2290 prescriptions. Age-wise distribution of the patients reveals that 530 (23.2%) patients were <20 years, 970 (42.4%) were in the age bracket 21–40 years, 590 (25.7%) were 41–60 years old and 200 (8.7%) patients were >60 years old. Of the total patients, 980 (42.8%) were males and 1310 (57.2%) were females (Table 1).

Table 1 Characteristics of the patients (n = 2290)

	Number of patients	%
Age in year		
>20	530	23.1
21–40	970	42.4
41–60	590	25.7
>60	200	8.7
Gender		
Male	980	42.8
Female	1310	57.2

Prescribing indicators

A total of 7720 medicine products were prescribed in 2290 prescription encounters as analysed in this study. The average number of drugs per prescription was 3.37, the maximum number of drugs prescribed in a single prescription was 11, while about 57% of the prescriptions contained at least three drugs. There was not a single prescription wherein no drug was prescribed. The average number of drugs prescribed in each of the four age groups was 2.66 drugs per encounter in the age group <20 years, 3.17 in the age group 21–40 years, 3.69 in the age group 41–60 years and >4.25 in the age group >60 years. Brand names were dominantly used in prescribing. Only 4.8% of the drugs were prescribed with generic names. Antibiotics constituted 41.5% of the total drugs prescribed. The frequency of encounters with injections was 12.3%. Of the total types of prescribed drugs, 87% are found in the NEML. Detail of the WHO prescribing indicators as recorded by this study is given in Table 2.

Patient care and facility indicators

The average consultation time as calculated by this study was 3.61 (SD = 1.07) minutes and the average dispensing time was 81 s. 80% of the prescribed drugs were dispensed but only 20% of the dispensed drugs were adequately labelled. 30% of the patients knew the correct dosage of the drugs prescribed (Table 3). A copy of the NEML was available in all outpatient departments of the hospital. The availability of the key drugs in the stock was 75%.

Prescription legibility and completeness

The patient name was missing in 15% of the prescriptions, while 56% of the prescriptions lack patient address. Other information commonly missing in prescriptions was the diagnosis in 39%, dosage form in 45%, routes of administration in 56% and duration of drug intake was missing in 48% of the prescriptions (Table 4).

Antibiotic prescribing pattern

Different groups of antibiotics were prescribed to the patients including amoxicillin + clavulanic acid 756 (33%), azithromycin 275 (12%), *clarithromycin* 229 (10%), cefixime 115 (5%), cephradine 115 (5%), ciprofloxacin 115 (5%) and levofloxacin 92 (4%), as shown in Table 5. Most (38.9%) of the prescriptions with antibiotics had one antibiotic prescribed, whereas, 60 (2.6%) prescriptions had two or three antibiotics prescribed (Table 5).

Other commonly prescribed drugs

Besides antibiotics, the drugs which were prescribed more frequently in our setting included: analgesics 33.2%, multivitamins 13%, antihistamines 12.1%, amlodipine 38%, metformin 26%, low dose aspirin 25%, esomeprazole 20% and montelukast 6.7%, as presented in Table 6. Corticosteroids were present in 5% of the prescriptions.

Table 2 Prescribing indicators

Indicator	Total encounters/drugs	Average/%age	WHO standard
Drugs prescribed per patient encounter	7720	3.37 (1.52)	1.6–1.8
Drugs prescribed by generic names	371	4.8%	100%
Encounter with antibiotics	950	41.5%	20.0–26.8%
Encounter with injections	282	12.3%	13.4–24.1%
Drugs from Essential drug list		87%	100%

Total number of prescriptions = 2290; total number of drugs = 7720. Average values are given as mean and S.D.

Table 3 Patient care and health facility indicators

Patient care indicators	Average/%	WHO standard
Average consultation time in minutes	3.61 (1.07)	≥10 min
Average dispensing time in seconds	81	≥90 s
% of drugs actually dispensed	80%	100%
% of drugs adequately labelled	20%	100%
Patient correct knowledge of drug	30%	100%
Facility-specific indicators		
Availability of Essential drug list to practitioners	Yes	Yes
% key drugs available	75%	100%

Total number of prescriptions = 2290; total number of drugs = 7720. Average values are given as mean and S.D.

Table 4 The frequency of the prescriptions with missing key information

Missing key element	Number of prescriptions, %
Patient name	344, 15%
Patient address	1282, 56%
Date	160, 7%
Diagnosis	893, 39%
Dosage form	1031, 45%
Dose	458, 20%
Routes of administration	1282, 56%
Dose interval	458, 20%
Duration of therapy	1099, 48%

Discussion

The irrational prescribing practices causing physical and financial harm to the patients are worldwide.[17] A review of prescription-writing trends is a useful tool to identify improper practices in the existing healthcare delivery system and to evaluate the knowledge and attitude of prescribers towards disease management, drug utilization, and patient care. In the current study, WHO formulated drug use indicators are used to review prescribing trends to identify existing treatment practices that may help to solve problems associated with drug therapy.

An analysis of the prescriptions in our study revealed that a total of 7720 drugs were prescribed in 2290 prescription encounters, thus the average number of drugs per prescription was 3.37 (SD = 1.52). This value has surpassed the WHO recommended range of 1.6 to 1.8 per prescription as mentioned in WHO prescribing indicators.[3] Previous studies conducted on primary and tertiary level health facilities in Pakistan have shown a similar trend of over-prescribing the drugs, with values in the range of 2.75 to 3.4 drugs per encounter.[1, 14, 15, 18, 19] The average number of drugs prescribed per patient also showed an increasing trend with the increase in the age of the patients, as the minimum number of drugs (2.66) were prescribed in the age group <20 years, while the maximum number (4.25) of the drugs per patient was prescribed in the age group >60 years. Polypharmacy is defined as more drugs being prescribed or taken than are clinically appropriate in the context of a patient's comorbidities.[20] Polypharmacy is more common in elderly patients because of the need to treat multiple conditions that develop with age, as seen in this study.[21] Several other reasons may also be accounting for over-prescribing practices. For example, incompetency of the physicians, unavailability of guidelines for clinical practice, monetary incentive, lack of continuous medical education of the prescribers, and limited therapeutic options.[10] As most of the patients visiting the public sector hospitals belong to the lower socioeconomic class, inappropriately prescribing multiple drugs puts an unnecessary financial burden on the patients alongside the healthcare system. Polypharmacy may also adversely affect the treatment outcome due to possible adverse drug reactions, drug–drug interactions, and reduced patient compliance.[22]

Table 6 Other drugs commonly prescribed at the secondary healthcare hospital

Drug category	Total (*n*), %age
Analgesics	**760, 33.2%**
Paracetamol	366, 16%
Diclofenac sodium	195, 8.5%
Ibuprofen	188, 8.2%
Orphenadrine + paracetamol	176, 7.7%
Anti-histamines	**274, 12.1%**
Fexofenadine	214, 9.5%
Citrazine	53, 2.3%
Loratadine	7, 0.3%
Multivitamins	**298, 13%**
Calcium and vitamin D	**115, 5%**
Other drugs	
Amlodipine	870, 38%
Metformin	595, 26%
Low dose aspirin (75 mg)	573, 25%
Esomeprazole	458, 20%
Disodium hydrogen citrate	458, 20%
Prednisolone	115, 5%
Montelukast sodium	153, 6.7%

Bold values indicate total number of all the drugs within a pharmacological class e.g. Analgesics, whereas, non-bold values are the numbers of individual drugs.

Physicians are recommended worldwide to use generic names instead of any brand or trade name for prescribing the drugs. However, the use of generic names was disappointedly low in our study as up to 95% of the drugs were prescribed with their brand names, against WHO advise for 100% generic prescribing. Brand name prescriptions not only compromise patient safety due to the possibility of drug duplication or wrong drug administration resulting from confusing similarity between the brand names of chemically and pharmacologically different drugs but also limits the choice of a drug product by the patients based on their affordability. Additionally, generic prescriptions provide ease of information access and better communication among healthcare professionals.[1] Consistent with the results of our study, 100% of the drugs have been reported as prescribed with their brand names in a tertiary healthcare hospital of Pakistan,[14] however, the situation appears

better in the primary healthcare centres as a couple of previous studies have reported 41.15% and 71.6% generic prescribing at basic healthcare units and dispensaries of Pakistan.[1, 18] A low tendency of prescribing drugs with generic names is commonly reported from some other Asian countries including Saudi Arabia, India and UAE as well with figures of 15.1%, 10% and 4.4%, respectively.[5, 10, 23] However, reports from Bangladesh, Cambodia, and Egypt are standing out with high figures.[5, 24] Several reasons can be ascribed to the limited trend of writing generic prescriptions as seen in this study, such as the prescribers' trust in branded products, extensive promotional activity of pharmaceutical companies influencing prescribers' choice, online prescribing systems with the list of the drugs available as brand names or lack of legal binding to prescribe generic medicines. Primary healthcare centres of Pakistan are usually managed by one medical officer on duty who deals with community health issues of acute or mild to moderate severity, whereas, patients with chronic diseases and complicated cases are referred to higher-level hospitals.[8] The relatively high percentage of prescribing with generic names in the primary healthcare setting may be the result of the basic level of care provided at these centres requiring simple medicines mostly available in stock of the healthcare setting.

Developing countries are commonly encountering the problem of the emergence of antibiotic resistance due to their non-judicious use including over-prescribing, thus requiring more expensive antibiotics even for treating common infections. Our study shows that the encounter with antibiotics was 41.5% which was higher than the WHO defined range of 20.0–26.8%. This study, affirming the previous reports from primary and tertiary healthcare centres of Pakistan (Table 7), suggests a generalized high propensity of antibiotic prescribing and thus signifies the need to improve the antibiotic prescribing behaviours of the physicians in Pakistan. In contrast to the reports from Pakistan, relatively lower frequencies of 9.4% and 39.2% are respectively reported in studies from India and China.[25, 26] A tendency of prescribing more than one antibiotic is also noted in our study as 2.6% of the prescriptions were written with two or three antibiotics. The reasons underlying the higher antibiotic prescribing trend in Pakistan could be the cost or insufficiency of laboratory diagnostic facilities, lack of clinical practice guidelines, incompetence of the physicians and cultural beliefs of the people.

Limited use of injections is recommended to avoid the possibility of infections and provide low-cost treatment.[18] In the current study, the prescriptions with an injectable constituted 12.3% of the total prescriptions reviewed, and this value is almost comparable to the WHO recommended range of 13.4–24.1%. The results thus demonstrate that there is not an overuse of injections in the outpatient setting of the secondary healthcare hospital. This correlates with the results from studies in tertiary care hospitals that have reported 2.8% and 0% rate of prescribing the injectable dosage form.[1, 14] Whereas, two previous reports from primary healthcare centres of two cities of Pakistan have revealed 16.05% and 27.1% encounters with injections.[1, 18] The higher dependency on injections in primary healthcare centres as reported previously could be the result of the belief of the rural dweller that the injections are more effective and provide quick relief.

Of the total drugs prescribed in this study, most (87%) of the drugs were prescribed from National Essential Drug List, as opposed to WHO advice for 100% compliance. The concept of essential drugs is highly helpful to ensure the accessibility and the affordability of medicines and satisfy the priority healthcare needs of the masses. Supporting our findings, previous studies from Pakistan have also

Table 5 Antibiotics prescribing pattern in the secondary healthcare hospital

Name of antibiotic	Number of encounters	%
Penicillin		
Amoxicillin + Clavulanic acid	756	33%
Macrolides		
Azithromycin	275	12%
Clarithromycin	229	10%
Cephalosporins		
Cefixime	115	5%
Cephradine	115	5%
Fluoroquinolones	207	9%
Ciprofloxacin	115	5%
Levofloxacin	92	4%
Number of antibiotics/prescription		
0	1340	58.5
1	890	38.9
2	50	2.2
3	10	0.4
Total	2290	100

Table 7 A comparison of core drug use indicators obtained in the current study with other reports from Pakistan

Core drug use indicators	Current study	Primary healthcare settings		Tertiary healthcare settings		
	(n = 2290)	(n = 1000) [1]	(n = 600) [18]	(n = 400) [14]	(n = 480) [15]	(n = 2400) [19]
Drugs prescribed per patient encounter	3.37 (1.52)	3.4 (0.80)	2.75	>3 drugs = 48% <3 drugs = 52%	3.3	2.8 (1.3)
% medicines prescribed by generic name	4.8	71.6 (15.7)	41.15	0%		56.6 (1.2)
% encounters with antibiotics	41.5	48.9 (20.2)	48.6	34.3	74	51.5 (0.5)
% encounters with injections	12.3	27.1 (9.8)	16.05	2.8		0.0
% medicines prescribed from EDL	87	93.4	75.08	-		98.8
Average consultation time (minutes)	3.61 (1.07)	2.2 (0.8)	2.73	-		1.2 (0.8)
Average dispensing time (s)	81	38.0 (12.1)	90	-		8.7 (4.9)
% of medicines actually dispensed	80	90.9 (9.5)	70.45	-		97.3 (1.3)
% of medicines adequately labelled	20	100	56.14	-		100
% of patients with knowledge of correct doses	30	62.1 (19)	18.79	-		61.6 (0.6)
Availability of EDL to practitioners (yes/%)	Yes	100	-	-		100
% key medicines in stock	75	82.0 (7.9)	-	-		72.4 (0.4)

-indicates parameter not studied.

demonstrated that the drugs prescribed from EDL constituted less than 100%.[1, 14, 18]

A study of patient care indicators helps to find additional important factors that may influence rational drug utilization. As measured by the current study, the average consultation time was 3.61 min, as opposed to the optimum consultation time set by WHO (≥10 min). The short consultation time correlates with the values previously reported from primary and tertiary healthcare facilities of Pakistan as well as from other developing countries: India 2.3 minute and Kuwait 2.8 minute.[26, 27] According to WHO, insufficient consultation time leads to incomplete patient examination and subsequent irrational therapy.[25] The average dispensing time, as noted in this study, was 81 s (optimum time ≥90 s). In comparison, previous studies conducted in Pakistan have reported an average dispensing time of 90 s and 38 s, respectively, in primary healthcare centres of Islamabad and Bahawalpur.[1, 18] An insufficient dispensing time can be a barrier to appropriate labelling and providing complete information to the patients, for example about the proper use of the drug and its storage. It is also affirmed by the results of this study as only 20% of the drugs were adequately labelled. Unlike our findings, previous reports, presenting the values of 100% and 56%, reveal a better scenario in primary healthcare centres and tertiary care hospitals of Pakistan.[1, 18, 19] Our study also reveals that the level of stock in the indoor pharmacy was insufficient to fill the prescription, as 80% of the total prescribed drugs were dispensed to the patients (optimum level =100%). A similar situation is also reflected by previous studies conducted in the primary and tertiary healthcare centres of Pakistan showing the availability of 70.45 to 97.3% of the total prescribed drugs in stock (Table 7). The value reported by the current study is less than the values reported by studies conducted in Saudi Arabia (99%) and Kuwait (97%)[5, 27] and higher than the reported value of 56% in Tanzania.[28]

Patient knowledge of the correct dose and method of drug administration is one of the most essential factors contributing to the achievement of desired therapeutic outcomes. Whereas, insufficient knowledge is a principal barrier towards the rational use of drugs. Our study demonstrates poor knowledge of the patients about the dose and administration of the prescribed drugs. This can be related to insufficient consultation and dispensing time. Similar outcomes have also been seen in the reports of studies in primary healthcare centres of Pakistan.[1, 18, 19]

A prescription should legible and written with all essential elements required for appropriate drug dispensing, to ensure continuity of care and fulfil legal requirements. Poorly legible and incomplete prescriptions contribute to the development of antibiotic resistance, adverse drug reactions, medication errors and, financial losses to the patient.[13] In our study, 8.4% of 2500 prescriptions initially collected were dropped from the study because they were not readable. Whereas, the overall quality of the rest of the written prescriptions was also poor since the key elements were frequently missing from the prescriptions. Around half of the prescriptions had missing information about dosage form, route of administration and duration of therapy. 39% of the prescriptions lack the diagnosis, whereas, information pertaining to dose was missing in 20% of the encounters. Like our results, most prescriptions in studies from Nepal and India were missing the essential information.[5, 23]

After antibiotics, analgesics constituted the largest portion of the drugs prescribed in this study. Previous reports have also displayed the high trend of prescribing analgesics in both the primary and tertiary healthcare settings of Pakistan.[14, 18] As pain is a ubiquitous sign of most disorders, this tendency of commonly prescribing analgesics could be due to the patient's demand or physician's drive to provide instant relief to the patient from the pain.

Corticosteroids must be used with caution because they are associated with serious adverse effects and can cause dependence. Both physicians and patients tend to misuse corticosteroids.[29] However, this was encouraging to find that the trend of prescribing steroids is very low in our setting, which was only 5%. The value reported in this study even lower than the value from a previous study reporting 7.6% prescribing of corticosteroids.

To improve prescription-writing and drug-dispensing practices, it is suggested that prescriber and pharmacist education and training programs be organized regularly at the hospital. Furthermore, dispensing errors due to illegible handwriting and misspellings can be controlled by replacing handwritten prescriptions and drug labels with those generated electronically. The hospital can also get benefit from having guidelines in place for the optimal and responsible use of antibiotics which could be monitored by introducing an antimicrobial stewardship program and feedback provided regularly to the prescribers.

As secondary healthcare hospital in this study has no clinical pharmacist, it is time to understand that if the quality of healthcare provision is to be improved, the hospitals need to acquire the services of a clinical pharmacist who can take up the responsibility to not only play an active role in prescriber education but also help ease their busy routine by highlighting errors during routine prescribing. Moreover, it is also important to ensure the implementation of NEML at the hospital. As generic prescribing is not implemented in the existing legal framework, enforcing generic prescribing practices is difficult in Pakistan, however, the use of generic names can still be promoted through honest attempts. Minimizing the influence of pharmaceutical manufacturers on the prescribers would be advantageous in this regard. Furthermore, an awareness campaign and incentives could also be put in place to increase the prescribing of drugs by generic name.

As this study is limited to one hospital, the findings of this study cannot be generalized to the whole of Pakistan or extrapolated to international practices. These findings, however, add to the growing literature particularly around medicines and health systems in developing countries. Future studies are warranted to explore prescribing practices from hospitals of the other regions of Pakistan as well as to highlight challenges faced by prescribers and dispensing pharmacists as potential barriers to promoting rational drug use.

Conclusion

It is concluded that prescribing practices at the secondary healthcare hospital of Islamabad, Pakistan, are poorly compliant with WHO drug use indicators. The practices of polypharmacy, extensive brand prescribing, and over antibiotic prescribing was observed. Consultation time and dispensing time are also not sufficient for accurate disease evaluation and proper patient counselling. However, the use of corticosteroids and injections was within the optimum limits. Results of this study by providing baseline data on drug use indicators can help to improve prescribing practices in secondary care and higher-level hospitals, however, further studies are recommended to investigate the causes of poor prescribing trends in the healthcare centres of Pakistan for effective planning and implantation of remedial actions.

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Author contributions

M.A. and A.I. designed the study. A.I., E.T., H.Q. and J.S. collected the data. S.B. conducted the statistical analysis and drafted the manuscript. All authors participated in discussing the analysis and findings and have reviewed and approved the final version of this manuscript.

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Conflict of Interest

None declared.

Data availability

The supplemental data related to the current study are available from the corresponding author on reasonable request.

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