Evaluation of Drug Utilization Patterns Based on World Health Organization Drug use Indicators at Outpatients Clinics

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Irrational drug prescribing is considered one of the prime challenges for the healthcare sectors worldwide, leading to baneful outcomes in patients. The World Health Organization (WHO) drug use indicators include prescribing indicators, patient care indicators and facility indicators and prescribing indicators measure the performance of health care providers in several key dimensions related to the appropriate use of drugs. Patient care indicators are used to understand the way drugs are used. To evaluate the trends and issues related to prescription, patient care and facility at outpatient clinics in Jeddah and to contrast that to the WHO drug use indicators. A Cross-sectional study conducted between January to April 2019. A total of 153 prescriptions were collected from outpatient clinics of private and governmental hospitals were analyzed according to WHO guidelines. The statistical calculations were performed using Microsoft excel software. The results illustrate that the average number of drugs per prescription was 4.56 and the percentage of encounter with antibiotics was 8.4. A comparatively encouraging observations were observed during generic prescribing as it was observed to be 54.2%, the percentage of encounters with injection was 7.8 and the percentage of drugs prescribed from essential drug list (EDL) or formulary was 92%. The prescribed drugs average number per encounter was greater than what was considered ideal according to WHO standards; the other issue found was a lower percentage of generic prescribing compared to WHO ideal value, the rest of prescribing indicators including the prescribing from the essential drug list was almost similar to the ideal value recommended by the WHO (100%).

Introduction

Irrational medicines usage is one of the fundamental problems faced by the health sectors around the world, especially the negative effects on the patient, in addition to the increase in resistance to antibiotics and increase unusual in the cost of drugs [1-3].

Overuse of medication, inappropriate use of antibiotics, and excessive use of injections are among the most general forms of aberrant application of the drug, which can lead to disappointing results of treatment, drug reactions and high probability of loss of patients' life's[4].

The World Health Organization (WHO) has established three core elements to improve the rational use of drugs worldwide including prescribing indicators, patient care indicators, and healthcare facility-specific indicators. The prescribing indicators include a group of measured parameters represented as the average number of drugs per encounter, percentage of encounters with antibiotics or injection, percentage of drugs prescribed by generic, and the percentage of drugs from the essential drug list or formulary [5-7].

All prescribing indicators are based on behavior observed in small samples of patient prescriptions which are collected retrospectively or prospectively from a group of health facilities. Patient care indicators include average consultation time, average dispensing time, percentage of drugs actually dispensed, percentage of drugs adequately labeled, patients' knowledge of correct dosage. The patient care indicators address key aspects of what patients experience at health facilities, and how well they have been prepared to deal with the pharmaceuticals that have been prescribed and dispensed.

The time that prescribers and dispensers spend with each patient sets important limits on the potential quality of diagnosis and treatment. Patients for whom pharmaceuticals are prescribed should, at a minimum, receive well-labeled medications, and should understand how to take each drug. Facility indicators like availability of copy of essential drugs list or formulary and availability of key drugs [**5-7**].

According to WHO, there is a requirement for medication, which is to receive patients appropriate medication for their needs, and in doses that meet their individual requirements for a specified period of time at the lowest cost [**5-9**].The objective of this study was to check the trends of prescribing, dispensing and the facilities of the OPD clinics in Jeddah City, using the WHO indicators.

Materials and methods

A cross-sectional study was carried out in outpatient clinics between January to April 2019, to evaluate the drug prescribing, patient care and facility patterns based on the World Health Organization (WHO) indicators. The study was approved by the Institutional Human Ethics Committee (IHEC) of Ibn Sina National College for Medical Studies, Jeddah. The prescriptions were kept confidentiality by replacing the names with the numbers and then reviewed the prescriptions based on WHO criteria. We collected a total number of two hundred and fifteen prescriptions among this sixty two prescriptions were rejected due to inappropriateness to the study objective and finally one hundred fifty three prescriptions were included in this study.

Data were collected from the prescriptions, outpatient clinics and pharmacy department of private and governmental hospitals in Jeddah were analyzed according to World Health Organization indicators. Both acute and chronic outpatient prescriptions collected from outpatient clinics were included in this study. Hospital admitted patients prescriptions were excluded from this study. The WHO indicators were calculated as follows [**10-11**].

The prescribing parameters like Average number of drugs per encounter, Percentage of prescriptions with antibiotics, Percentage of drugs prescribed by generic name, Percentage of encounters with an injection prescribed and percentage of drugs prescribed from essential drug list (EDL) was measured and described. Patient care indicators like Calculation of Average consultation time, Average dispensing time, Percentage of drugs actually dispensed, Percentage of drugs adequately labeled and Patients' knowledge of correct dosage was measured and described. Finally, health facility indicators like availability of hospital own EDL and percentage of availability of key drugs was measured [**10 -13**].

The data was analyzed statistically for means, standard deviations, frequencies, and percentages were performed using SPSS program version 17.0 software.

Results and discussion

The **Table 1** describes about theWorld Health Organizationpatient care indicators in outpatient clinics was found that the average consulting time was about 3.2 minutes and the average dispensing time was observed as 2.1 minutes.

Table 1. World Health Organization patient care indicators in outpatient.

Prescribing Indicators	Total Number	Average/ Percentage
Average consulting time	489 min	3.2min
Average dispensing time	321 min	2.1 min
Percentage of drugs actually dispensed	672	96.4%
Percentage of drugs adequately labeled	650	93.25%
Patient knowledge of correct dosage	558	89%

The **Table 2** illustrate about the distribution of diagnosis of the study patients were observed as maximum patients were hypertension and second highest were diabetic patients.

Table 2. Distribution of diagnosis of patients.

Diagnosis	No of patients	Percentage (%)
Hypertension	21	13.72
Diabetes	13	8.49
Ischemic Heart Disease	5	3.26
Spondylopathy	2	1.30
Benign Neoplasm prostate	3	1.96
Osteoporosis	1	0.65
Urinary Tract Infection	1	0.65

The **Table 3.** Narrates the World Health Organization Health facility indicators in outpatient clinics. In this study we observed that all the health facilities had Hospital Essential Drug List (EDL) / Ministry Of Health EDL and Saudi Formulary / Hospital formulary were kept in all the OPD clinics.

Table 3. World Health Organization health facility indicators in outpatients.

Health facility indicators	Percentage/Yes/No
Availability of Hospital EDL / MOH EDL	Yes (100%)
Availability of Key Drugs	89%
Saudi Formulary / Hospital formulary	100%

The **Table 4** describes the average numbers of drugs per encounter were 4.56, the Percentage of drugs prescribed by generic names were 54.2 and also other World Health Organization (WHO) core drug use indicators were mentioned in this study.

In the **Table 5** shows that the maximum numbers of prescriptions contain 4-6 drugs are 45.7 % and twenty five prescriptions (16.3%) were containing 7-9 drugs per prescription. The prescriptions without generic name were 38% and the prescriptions without diagnosis were found to be 32.2%.
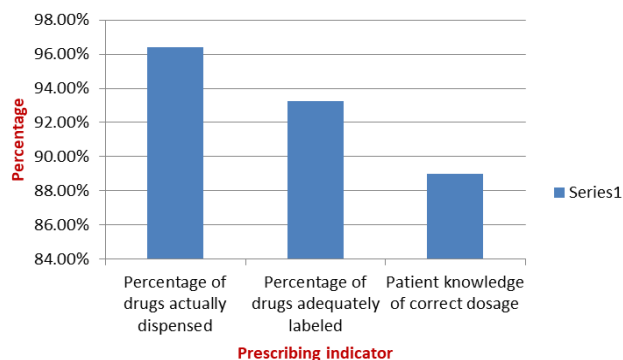
Table 4. List of World Health Organization core drug use indicators used in study.

| Prescribing indicators	Mean± S.D / Percentage ± S.D	Optimal/ideal value%
Average number of drugs per encounter	4.56 ± 3.7	1.6 -1.8
Percentage of drugs prescribed by generic names	54.2 ± 4.2	100
Percentage of encounters with antibiotics prescribed	8.4 ± 1.5	20 -26.8
Percentage of encounters with injections prescribed	7.8 ± 2.1	13.4 -24.1
Percentage of drugs prescribed from essential drug list or formulary	92 ± 3.8	100
Percentage of drugs actually dispensed	96.4 ± 7.8	100
Percentage of drugs adequately labeled	93.25 ± 2.7	100

Table 5. Number of drugs per prescription.

Drugs per prescription	No. of prescriptions	Total no. of drugs prescribed	Percentage
0-3	55	128	35.9
4-6	70	347	45.7
7-9	25	190	16.3
>10	3	32	1.96

In the **Fig. 1** shows the percentage of World Health Organization (WHO) patient care indicators and in the **Fig. 2 presents about the** Patient understanding about drugs found Sixty percent of patients moderately understand the drug use, thirty percent patients were well understood about the drug use and ten percent poorly understood.

Fig. 1. Percentage of world health organization Patient care indicators.
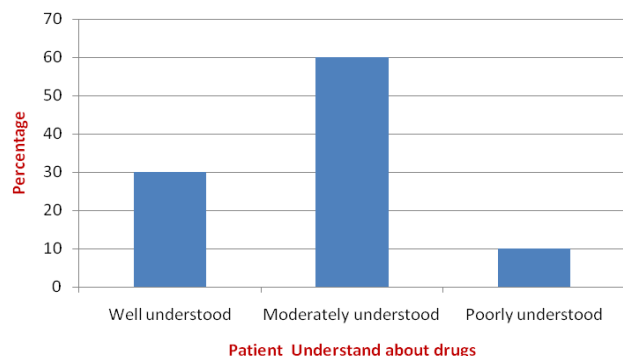
Fig. 2. Percentage of patients understanding of drug use.

The World Health Organization has standard core indicators of prescribing practices to determine the performance of health care providers in many key dimensions related to the rational drug applications. In our investigation it was found that the average number of drugs per prescription was 4.56. World Health Organization recommended 1.6-1.8 drugs per prescription. In our study found that the average number of drugs per prescription was higher than World Health Organization recommendations and also United Arab Emirates (UAE)[14], the other study conducted in outpatient clinics of hospitals in Jordan shows the average number of drugs prescribed per encounter was 2.93 [15].

The percentage of encounter with antibiotics was 8.4 percent observed in our study, but the recommended range of World Health Organization reference value is around 20.0 – 26.8% and it is observed that the physicians are much aware about the optimal use of antibiotics this value is within the World Health Organization standard. Appropriate antibiotic use has both clinical and economic significance to any health system and should be given adequate attention. Inappropriate use of antibiotics can potentially lead to antimicrobial resistance and increase the necessity to use more expensive antibiotics to treat common and life threatening infections.

Prescribing by generic name will help to reduce the cost of drug treatment and rationalizing the drug therapy. A relatively encouraging result was found with regard to generic prescribing as it was found to be 54.2%, Similar studies were conducted in United Arab Emirates and showed 57.6% [14], in another study in Jordan reported that the percentage of generic prescribing was found to be 64.1% [15] comparing to WHO standards 100%. It indicates requirement of educational program towards use of generic prescribing to reduce medication errors and promote cost effective treatment. Hence, the generic prescribing is the excellent way to ensure accessibility of drugs to the patients especially in developing countries where shortage of drug is a major problem and it should further encouraged.

Extensive use of injections leads to economic cost and health complications as non-sterile injections contribute to the transmission of HIV/AIDS, Hepatitis and other blood related diseases. In this investigation the % of encounters with injection was 7.8 where as the WHO approved range is 13.4%-24.1% it shows that physician of the OPD clinics following as per the guidelines, but the index of injections prescribing in UAE this study was 3.14% [14].

In this study we found that the Percentage of drugs prescribed from essential drug list (EDL) or formularywas 92% and similar to the ideal value recommended by the WHO (100%). Similar results were reported in UAE (100%) [14], while lower values were revealed from studies in India and Nepal (90.3% and 42.3%, respectively) [16, 17].

The percentage of drug prescribing from the EDL was 99.8% and almost similar to the ideal value recommended

by the WHO (100%). Similar results were reported in UAE (100%) [**19**], while lower values were revealed from studies in India and Nepal, (90.3% and 42.3, respectively) [**32, 34**]. The percentage of drug prescribing from the EDL was 99.8% and almost similar to the ideal value recommended by the WHO (100%). Similar results were reported in UAE (100%) [**19**], while lower values were revealed from studies in India and Nepal, (90.3% and 42.3, respectively) [**32, 34**].

The average dispensing time was 2.1 per patient, the percentage of drugs actually dispensed in OPD clinics was found 96.4 %, the percentage of drugs adequately labeled was found as 93.25 % and the patient knowledge about the correct dose of prescribed drugs was found around 89 % as shown in the **Table 1**. So, it is the responsibility of the pharmacist to aware patients by spending more time in counseling.

The prescribing practices like number of drugs per prescription were not appropriate as they consist of polypharmacy, lesser prescription by generic name and lack of knowledge of the patients drug use. There is an urgent need of improvement in the standards of prescribing patterns in many aspects and patient counseling. The prescriptions should include more generics name, reduce the drugs per prescription to improve the quality of care and there should be a well formulated action plan.

Conclusion

The average number of prescribed drugs per encounter was higher than what was considered ideal according to World Health Organization standards; the other issue found was a lower percentage of generic prescribing compared to World Health Organization ideal value, the rest of prescribing indicators including the prescribing from the essential drug list was 92% and almost similar to the ideal value recommended by the World Health Organization (100%).

Recommendation

Recommendations to change the ongoing prescribing practices should be based on the Standard Treatment Guidelines, Essential Drug List (EDL), and antibiotic policy or by following the information, education, and communication interventions. It is recommended that this study should be conducted on a larger scale to have a clearer picture of the situation.

Limitation

The study has a few limitations like the study was conducted only in a few OPD clinics with limited sample size and time limitation. The WHO prescribing indicators measure what is prescribed to the patients, but not the rationality of prescriptions as per standard treatment guideline. The time period of the study was limited (3 month). Despite a few limitations, this study can help to create awareness about the rational use of drugs.

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