



## Drug Prescribing Pattern among Physicians in an Outpatient Department of Tertiary Hospital, KSA

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### Author' contributions

The author designed the study, collected, analyzed the data, and wrote the manuscript.

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### ABSTRACT

**The Aim:** Was to assess the current prescribing pattern in the outpatient settings of tertiary hospital in Saudi Arabia, using WHO core drug use indicators as a measurement tools.

**Methods:** A retrospective study was designed. The Study was carried out in the outpatient pharmacy department at Al-Hada Armed Forces Hospital, Taif, Saudi Arabia. A total of 1000 prescriptions were selected randomly from January to December 2011.

**Results:** Patient's gender and age were not written in high proportion of prescriptions (24.2% and 85.3% respectively). In addition, patient's diagnosis was not mentioned in (65.8%) of total prescriptions. Instruction information was not available in (42%), while (16.2%) of prescriptions were prescribed in brand names and printed prescriptions were not found. There was a significant association between gender and availability of instruction in the collected prescriptions ( $P < 0.001$ ). The mean number of drugs prescribed per prescription was 2.74 and only (16.3%) of prescriptions contained antibiotics.

**Conclusion:** The results of this study revealed many positive points with minor aspects of inappropriate prescribing pattern in outpatients departments in the hospital. Promoting the use of clinical computer system is substantial to get more safe prescribing. Development and active implementation of rational prescription guidelines together with a powerful accountability system is needed to ensure that prescribers adhere to it perfectly.

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## 1. INTRODUCTION

The rational use of drugs requires patients to receive medications appropriate to their clinical needs, in doses that, meet their individual requirements, for an adequate period of time, and at the lowest cost to them and the community [1].

Irrational use of medicines is a major problem worldwide. World Health Organization (WHO) estimates that more than half of all medicines are prescribed, dispensed or sold inappropriately, and that half of all patients fail to take them correctly [2]. Irrational use has multiple faces such as; the overuse, underuse or misuse of medicines results in wastage of scarce resources and widespread of health hazards. Other examples of irrational use of medicines include: use of too many medicines per patient ("poly-pharmacy"); inappropriate use of antimicrobials, often in inadequate dosage, for non-bacterial infections; over-use of injections when oral formulations would be more appropriate; failure to prescribe in accordance with clinical guidelines; inappropriate self-medication, often of prescription-only medicines; non-adherence to dosing regimens.

Although the irrational prescribing is a global problem and has been focused for many years, still many countries are not paying enough attention to this old but ongoing problem across the world [3].

Studies in developing countries showed that as much as a third of drug prescriptions, accounting for 20 to 50% of drug costs, are irrational and that antimicrobials are among the most frequently prescribed medications [4]. A study in Saudi Arabia concluded multiple prescription error types in different healthcare settings including private and governmental hospitals [5].

In order to improve rational prescribing by physicians, a thorough review of current physician prescribing patterns must be understood.

A baseline survey is an important step in the current situation analysis to understand the weaknesses, if any. The data on the current patterns of drug use will assist the healthcare managers, policy makers, and health officials to assess the impact of changes in policy and to

plan for promoting rational drug use, thus securing the quality of medical care in hospitals in Saudi Arabia. The aim of this study was to assess the current drug prescribing practices in the outpatient settings of a tertiary hospital in Saudi Arabia, using WHO core drug use indicators as a measurement tools.

## 2. METHODS

A descriptive, retrospective study was carried out in outpatient pharmacy department of the Al-Hada Armed Forces Hospital. It is a tertiary healthcare facility with 368 beds. Ethical approval was obtained from the Research Ethics Committee in the hospital (Approval No.PTRC-11-01-109).

Stratification, according to the four seasons (Summer, Autumn, Winter and Spring), was done. Every season considered as one unit. A standardized retrospective systematic random sampling was used for data collection. The total sample size of 1000 prescriptions was gathered from January to December 2011. The modified WHO core drug use indicators were used as outcome measures. Careful analysis of information obtained on the database for prescription pattern of medicines was done. In accordance with the WHO list of products to be counted as generic and brand names, formulation and dosage form also were counted. The latest copy of Saudi National List of Essential Medicines (NLEM) was used to measure prescribing from it.

Data was processed by using the Statistical Package for Social Sciences (SPSS, version18). Mean and frequencies as percentages were used to describe variables. Chi-square analysis was used to test the association between different variables.  $P$  value  $< 0.05$  was considered as statistically significant.

## 3. RESULTS

In this study a total of 1000 prescriptions were analyzed. Patient gender was not written in 242 (24.2%) prescriptions. The dominant 853 (85.3%) of prescriptions in the current study not included the age of the patients, while patient's weight not be mentioned in all prescriptions, Table 1.

The current study showed that, the date of prescription was present in 957 (95.7%). Regarding the prescriber; the name of prescriber

was not available in 237 (23.7%) prescriptions, while 315 (31.5%) of them were not containing prescriber specialty, and 791 (79.1%) prescriptions contained prescriber signature. Patient's diagnosis was present in 658 (65.8%) of the prescriptions. There was no printed prescription which means all prescriptions were written by hand and there were 787 (78.7%) prescriptions written in official prescription format, Table 2.

**Table 1. Demographic characteristics of patients**

		Frequency	Percentage
Sex	Male	372	37.2
	Female	386	38.6
	Non available	242	24.2
Age	Available	147	14.7
	Non available	853	85.3
Weight	Available	0	0
	Non available	1000	100

Table 3 showed that, the unit dose form strength (UDF strength) was available in 788 (78.8%) prescriptions. Regarding the regimen dose of drug; it was not available in 340 (34%) prescriptions, while 346(34.6%) ones were complete the dose information and 420 (42%) prescriptions were not containing instruction

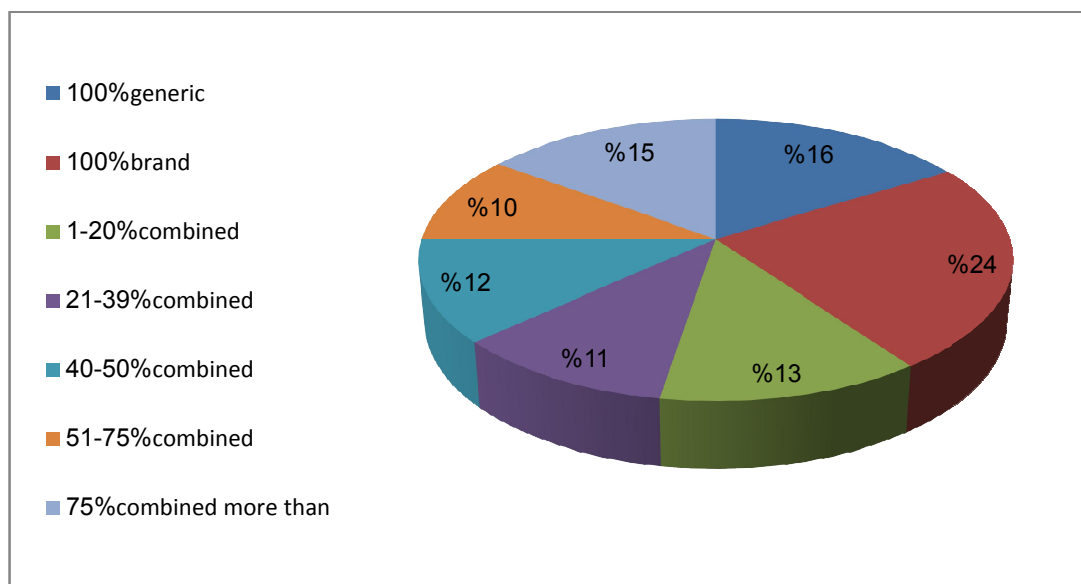
information. There was a significant association between both age and gender with availability of instruction in the prescriptions ( $P < 0.001$ ). Other association are shown in Table 3.

The mean number of drugs per prescription was 2.74 drugs. Fig. 1. shows that the drugs prescribed in generic names were 162 (16.2%), prescribing in brand names were 239 (23.9%) while prescribing in both generics and brands were 599 (59.9%).

There were 513 (51.3%) refill prescriptions and all drugs prescribed were available in copy of NLEM, Table 3.

Fig. 2. showed that, the prescribing drugs as tablets were 630 (63%) and injections were 115 (11.5%), while liquid form were 90 (9%), capsules were 100 (10%), and topical were 24 (2.4%) and other forms were 35 (3.5%).

Regarding the antibiotics; the study showed that the total prescriptions containing antibiotics were 163 (16.3%) from the collected prescriptions, and the most groups of antibiotics prescribed included penicillin 75 (46%), cephalosporins 56 (34.3%), quinolones 14 (8.5%), macrolides 12 (7.6%) and others types of antibiotics like fusidic acid were 6 (3.6%), Fig. 3. Most of the prescribed antibiotics were orally 142 (87%) and most antibiotics prescriptions contained only one antibiotic 145 (88.9%), Table 4.



**Fig. 1. Percentage of generic and brand names in the prescriptions**

**Table 2. Availability of basic prescriptions' data**

		Frequency	Percentage
Date of prescription	Available	957	95.7
	Non available	43	4.3
Prescriber name	Available	763	76.3
	Non available	237	23.7
Prescriber specialty	Available	685	68.5
	Non available	315	31.5
Prescriber signature	Available	791	79.1
	Non available	209	20.9
Diagnosis	Available	658	65.8
	Non available	342	34.2
Writing type	Print	0	0
	Hand written	1000	100
Legibility	Yes	680	68.0
	No	320	32.0
Prescription' format	Official	787	78.7
	Non official	213	21.3

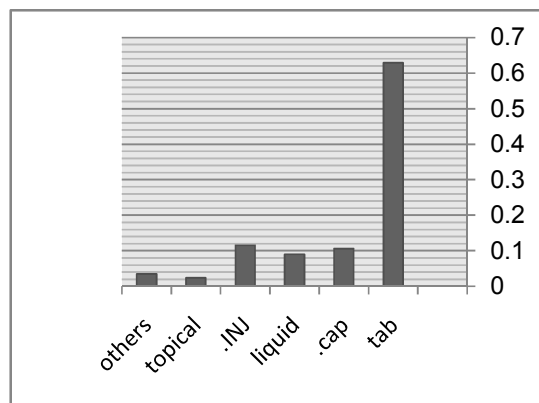
**Table 3. Availability of prescribing agent information**

		Frequency	Percentage	P-value	
				Gender	Age
UDF* strength	Available	788	78.8	0.001	0.109
	Non available	212	21.2		
Regimen	Available	660	66.0	0.000	0.012
	Non available	340	34.0		
Dosage information	Complete	346	34.6	0.000	0.666
	Incomplete	351	35.1		
	Non available	303	30.3		
Instruction information	Complete	232	23.2	0.000	0.000
	Incomplete	420	42.0		
	Non available	348	34.8		
Refill prescription	Yes	513	51.3	0.166	0.606
	No	487	48.7		

\*USD=Unit dosage form

#### 4. DISCUSSION

In clinical practice, investigating utilization of medicines among the community is crucial step to reach rational use of medicines. It is very important to clarify the problems, to support the decision makers in the health authorities for right management. In this study presence of age and weight was rare in the prescriptions. This information is very important to improve patients' health through pharmaceutical care by decreasing mistakes and assurance of accurate doses. Comparing with pervious study in Saudi Arabia this information including age and weight was written in higher proportion in prescriptions collected from primary health care centers in Qassim region [6].

**Fig. 2. Common rout of administration prescribed**

Unfortunately, in the current study, printed prescriptions were absent from the pharmacy archive. It was thought that, handwritten prescription may result in more errors, [7] so the US Institute of Medicine recommended E-prescribing to be implemented as standard [8].

The results revealed that, an average number of drugs prescribed per consultation was (2.74) slightly higher than the recommended value which is less than 2 drugs [9].

This average number was similar to that reported by a study in India [10], but was higher than average number in Ethiopian study (1.9±0.91) [11].

Generic prescribing offers more cost-effective medications. In the current study generic prescribing was low (16.2%), while the percentage should optimally be close to 100% [12]. It was low even compared to percentages reported by the previous local studies, which ranged from 41.0% to 48.0% [6], and was lower than Indian study (73.4%) [13]. The low generic prescribing identified in this study points to the high tendency of using brand-name medicines and may be attributed to the absence of regular and continuous education. High proportion of physicians usually prescribe the medicines in brand-name according to the availability of drugs in the local pharmacy. High percentage of generic prescriptions in different African countries such as Ethiopia [11,14], Zimbabwe [15] and Tanzania [16]. The recommended percentage of prescribing from NLEM is similar to our finding in the current study (100%) [12], which indicated good commitment by physicians.

The overall percentage of prescriptions for oral route in the current study was more than eighty

percent while injections was only 11.5%, which was better than what had been reported by Sudanese study and other developing countries [17,18,19]. This low percentage of prescribing injection pattern in the hospital may be referred to awareness of prescribers about the problems associated with frequent use of injections. Injection's uses may be unsafe and could be accompanied with serious problems such as transmission of blood-borne viruses and other microbial pathogenic organisms to the patients. [20,21].

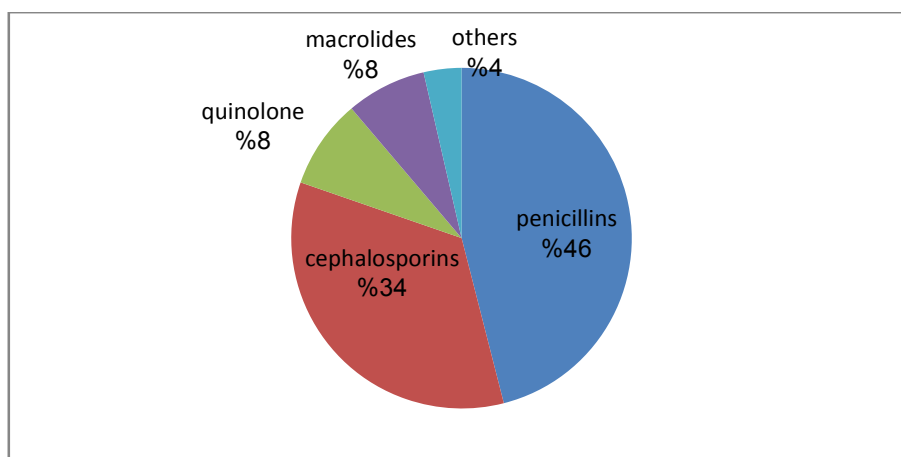
A substantial utilization of antibiotics was identified in this study (16.2%). It was computable with the recommended value which should be less than 30% [9]. It was also lower than results of Sudanese study [22], Indian study [10], and in Malaysia 18% of general practitioners prescribed antibiotics to treat common colds [23]. In Canada, the majority of preschool children receiving antibiotics for respiratory tract infections; 85% out of these prescriptions were inappropriate [24]. Overuse of antibiotic may have potential to promote increased cross-resistance. [25], and also attributed to destruction of normal flora in the GIT lead to many clinical side effects like toxic mega colon and pseudomembraneous colitis [26]. The irrational use of antibiotics, forced many researchers to evaluate the consumption of this type of medicines aiming to control the risk and its inappropriate utilization [27].

The limitation of our study is that, it was conducted in one hospital. Although it is a major hospital but other studies are needed to be carried out in other different governmental hospitals.

**Table 4. Data about antibiotics in the prescriptions**

		<b>Frequency</b>	<b>Percentage</b>
Rout of AB* administration	Oral	142	87.1
	Other	20	12.9
Presence antibiotics and percentage	0%	838	83.8
	less than 20%	97	9.7
	20-29%	10	1.0
	30-50%	17	1.7
	more than 50 %	38	3.8
If there more than one AB*	2	18	11.1
	1	145	88.9

\*AB=Antibiotics



**Fig. 3. Type of antibiotics prescribed**

## 5. CONCLUSION

The results of this study revealed many positive points with minor aspects of inappropriate prescribing pattern in outpatients departments in the hospital. Low generic prescribing and omission of prescription elements such as patient' age, diagnosis and prescriber' information are the major prescribing error. Promoting the use of clinical computer systems, for safe prescribing, and prescribing patterns need development and active implementation of rational prescription guidelines together with a powerful accountability system to ensure that prescribers adhere to it perfectly.

## COMPETING INTERESTS

Author has declared that no competing interests exist.

## CONSENT

Not applicable.

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