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Assessment of prescription pattern and prescription errors at primary healthcare centres in Alkhoms city, northwestern Libya

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ABSTRACT

Background: The medical prescription is a handwritten or electronically computerised legal document. It must include all the required information and adhere to the prescription writing guidelines to be considered valid. In Libya, many of the previous studies reported that the majority of prescriptions are handwritten and contain medication errors that arise due to the high omission of legal or procedural requirements in the medical prescriptions by the majority of physicians. Consequently, the present study is designed to help in understanding the medical prescription practices and errors, which will lead to developing the healthcare system in Libya.

Objectives: This study aimed to evaluate the prescription patterns and prescription errors in outpatient prescriptions issued by physicians working in primary healthcare centres in Alkhoms city, northwestern Libya

Methods: A comprehensive analytical study was carried out to evaluate the outpatient prescription patterns and errors. A total of 405 outpatient prescriptions issued by physicians and specialists working in various primary healthcare centres in Alkhoms city and its suburbs in northwestern Libya were collected from several pharmacies and assessed. The study lasted three months.

Results: A total of 405 prescriptions containing 1852 drugs were reviewed in this study. The handwritten percentage prescriptions and computer-typed percentage prescriptions were 98.52% and 1.48%, respectively. The average number of drugs per prescription was 4.57. Most of the physicians prescribed drugs using their brand names (96.06%). The name of the patient was not mentioned on 5.18% of the prescriptions, whereas the prescriber's name was not found on 80.25% of the total prescriptions. The outcomes of the present study also displayed that the information related to the patient was usually available; in contrast, some important information related to the drugs was ignored in most of the prescriptions, including the route of drug administration (71.12%). Half of the examined prescriptions were approximately lacked information about the diagnosis (48.40%), and 29.62% of the prescriptions lacked the date of the prescription.

Conclusions: The present study shows a low level of commitment to World Health Organization (WHO) guidelines related to prescribing indicators and high prescription errors. Moreover, according to the findings of this study, we recommend introducing the use of electronic prescriptions throughout the healthcare system in Libya. This will lead to updating the prescription form to include all the elements recommended by the WHO in the prescription guidelines.

Keywords: *Prescription patterns; pharmacists; Prescription errors; Primary healthcare, Libya; WHO prescribing indicators*

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1. Introduction

Improving drug therapy is an essential part of the health care system to optimize a patient's quality of life. Drugs play a vital role in the enhancement of a good health status for patients. Generally, prescribing a medication is a complex process, and thus, the drug should be prescribed carefully and used in the right way. The complexity of the process lies in the knowledge of drug indications, determining the appropriate dose and its frequency, defining the suitable route of drug administration and dosage form for use, educating the patient about expected side effects, and monitoring for effectiveness and toxicity. In addition, selecting the drug of choice, avoiding the drug-drug interactions, and finally, considering the background of the cost and availability of drugs in pharmacies [1]. Incorrect use of medicine in addition to its direct impact on patient life and safety, it wastes resources and reduces the quality of patient care. Most of the drugs in the essential medicines list are safe, efficacious, and affordable, and thus the access and rational use of these drugs is the best way to improve the level of primary health care in communities [2].

The prescription is a handwritten or electronically computerised legal document, comprising instructions for medication authorization from a qualified healthcare provider licensed to the pharmacist, such as a physician or dentist. The medical prescription must include specific vital components to be considered valid. These components include registration number, the date of issue, the patient's name, date of birth, sex, and address; moreover, it should be contained on the specific treatments prescribed involving the drug's name, strength, dosage form, and route of administration, and finally, the name and signature of the prescriber [1,3]. Prescription errors are a failure in the prescription writing process, leading to incorrect descriptions about the formulation, dosage form, therapeutic dose, frequency of the dose, route, and duration of administration of the described drug, as well as the identity of the recipient. Therefore, a prescribing fault can arise due to the high missing of legal or procedural requirements in the medical prescriptions, such as the choice of the wrong drug, wrong strength of the dose, wrong dosage form, wrong route of administration, and drug-drug interactions which outcomes in several drug related problems, such as, insufficient dose, over-dose, drug interactions, drug allergy, and non-compliance [4]. In contrast, poor legibility of handwriting prescriptions, which is represented in the use of abbreviations or incomplete writing of prescriptions, can also lead to misinterpretation by healthcare personnel, and this can result in errors in drug dispensing and administration [5]. Consequently, the present study is designed to help in understanding the medical prescription practices and errors, which will lead to developing the healthcare system in Libya.

2. Methods

Study design and data collection, and analysis

The present study was designed to evaluate the outpatient prescription patterns and prescription errors, which were issued by various healthcare centres in Alkhoms city, northwestern Libya. The study was conducted over three months and used the random sampling method, in which outpatient prescriptions were included, whereas the prescriptions of discharged patients and admitted patients were excluded. In this work, 405 official prescriptions were collected and analyzed. The information from these prescriptions was recorded separately for each prescription, and then analysed using Microsoft Office Excel 2013. The results of this study were expressed in the form of numbers, average, and percentage according to prescribing indicators adopted from previous studies (3,6-8), which were based on the WHO guidelines. These indicators with their optimal values include; the average number of drugs prescribed per prescription (1.6–1.8), the percentage of drugs prescribed by generic name (100%), the percentage of prescription where an injection was the route of administration (13.4– 24.1%), the percentage of prescriptions compromising an antibiotic (20.0– 26.8%), and the percentage of drugs prescribed from the Essential Drugs List (EDL) (100%). Furthermore, the prescription errors are mainly classified as omission errors related to drugs (including drug dosage form,

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dose, frequency, and route of administration) and omission errors related to the prescriber (including patient name, age, and gender, prescriber name, and signature).

3. Results

A total of 405 prescriptions containing 1852 drugs were evaluated in this study. The resulting data corresponding to the prescribing indicators is summarized in Table 1.

Table 1. Prescribing indicators (n= 405 prescriptions with 1852 drugs)

Prescribing indicator assessed	Total drugs/prescriptions	Average/ percentage
The percentage of handwritten prescriptions	399	98.52%
The percentage of computer-typed prescriptions	6	1.48%
The number of drugs per prescription	1852	4.57
Percentage of drugs prescribed by generic name	73	3.95%
Percentage of drugs prescribed by brand name	1779	96.05%
The percentage of prescriptions with antibiotics	132	32.59%
The percentage of prescriptions with injection	45	11.11%

Additionally, the results of the current study displayed a variety of prescribing errors related to prescriber, patient, and drug due to missing optimum prescription details specified in the WHO guidelines, as shown in Table 2.

Table 2. Prescribing errors: omission errors related to prescriber, patient, and drug (*n*= 405)

Types of information	Missing (*n*)	Missing (%)
Prescriber information		
The name of the prescriber	325	80.25%
The communication way with the prescriber	405	100%
The signature of the prescriber	81	20%
Patient information		
Name	21	5.19%
Age	69	17.04%
Gender	53	13.09%
Address	405	100%
Drug information		
Dosage form	38	8.64%
Therapeutic dose	32	7.90%
Frequency of dose	24	5.92%
Route of drug administration	288	71.12%
Others		
Diagnosis	196	48.40%
Prescription date	120	29.63%

4. Discussion

A total of 405 drug prescriptions were collected and reviewed in this study. On the basis of WHO guidelines, none of these prescriptions contained all the requirements of the typical prescription. Only six prescriptions were computer-typed. The percentage of handwritten prescriptions and computer-typed prescriptions was 98.52% and 1.48%, respectively. These prescriptions comprise a total of 1852 drugs. The average number of drugs per prescription was 4.57. This value is higher than the WHO-recommended optimum level of (1.6-1.8); however, it's similar to the reported value in the previous study conducted in Libya by (*Ahmed Atia, et al, 2022*) (8). The percentage of drugs prescribed by generic name was very low (3.95%), since most doctors prefer to use the brand name when prescribing medications. Nevertheless, these findings are compatible with *Emira Bousoik et al (2023)* previous study. Out of 405 prescriptions were reviewed, 132 of

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them had at least one antibiotic prescription (Table 1), resulting in an overall percentage of prescriptions with antibiotics of 32.59%; however, the finding was close to the WHO recommendation and similar to outcomes of the previous study conducted in Libya by (*Ahmed Atia, et al, 2022*) (12). Moreover, a percentage of 11.11% of prescriptions contain injections. This percentage value is consistent with the WHO guidelines and slightly lower than the previously reported value in Libya (*El Yamani M.A., et al, 2021*) (9), and also in Nepal (Shrestha and Prajapati, 2019) (3). Additionally, the results of the current study also displayed a variety of prescribing errors related to prescriber, patient, and drug, as shown in Table 2. This is a significant variation arising from missing the optimum prescription details specified in the WHO guidelines. The prescriber's name was mentioned on 19.75% of the prescriptions, and in contrast, only 20% of doctors did not sign their prescriptions. Notably, all of the prescriptions lacked communication with the prescriber. These results were almost identical to the results of previous studies (Shrestha and Prajapati, 2019; Emira Bousoik, 2023) (3,10). In the present study, although some of the patients' names were not fully written in the reviewed prescriptions, 94.82% of prescriptions contained the patient's name. The age of the patient was presented in 82.96% of the prescriptions. According to the WHO guidelines, the patient's address is an essential element that should exist in prescriptions. Remarkably, in this study, all of the prescriptions lacked the patient's address. This finding is similar to most of the previous studies (10). Finally, writing down the diagnosis is an essential element of the prescription, as it may help pharmacists to understand the correct drug when the handwriting is not clearly readable. The outcomes of the current study indicate that half of the prescriptions fail to specify the diagnosis. Furthermore, the date of prescription is a very important part as it helps patients know the start and end dates of treatment and also when to follow up with the doctor. In the present study, the date was absent only in 29.63% of the prescriptions, and these results were better than the results obtained by *Alhmmali Abdalla et al (2024)* (11), who found that the date error was 53%.

5. Conclusion and recommendation

The study shows a low level of commitment to WHO guidelines related to prescribing indicators and high prescription errors. Prescribing using handwritten, brand names, and a high number of drugs per prescription was a major problem. The study found that major errors in the prescriber were the name of the prescriber and the communication method with them.

In the present study, researchers recommend introducing the use of electronic prescriptions throughout the healthcare system in Libya, and updating the prescription form to include all requirements by the WHO.

ETHICS STATEMENT

Not Applicable

AUTHORS' CONTRIBUTIONS

MA: Conceptualization; study design; lead investigator; data curation; supervision of fieldwork; writing — original draft; corresponding author and guarantor.

ME: Methodology; data collection and verification; formal analysis; preparation of tables; writing, review, and editing.

NB: Resources support, critical revision for important intellectual content, supervision and mentoring, and final manuscript approval.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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