



# Assessment of Completeness of Handwritten Prescriptions in Eastern Libya

Emira Bousoik<sup>1</sup> Nesrin Alhusadi<sup>1</sup> Hana Alzawi<sup>1</sup> Rehab Ramadhan<sup>2</sup> Rawaa Albarassi<sup>1</sup>

<sup>1</sup>Faculty of Pharmacy, Derna University, Derna, Libya

<sup>2</sup>Ministry of Health, Derna, Libya

Address for correspondence Emira Bousoik, PhD, Department of Pharmacology and Toxicology, Derna University, Derna, Libya (e-mail: E.bousoik@uod.edu.ly).

Libyan Int Medical Univ J 2023;8:26–30.

## Abstract

**Background** Prescriptions, medicolegal documents issued by physicians to patients, must be written accurately and clearly, contain all the required information, and adhere to the guidelines for prescription writing. In eastern Libya, most prescriptions are handwritten. Incomplete prescriptions might lead to serious medication errors.

**Aim** The aim of this article was to assess the completeness of handwritten prescriptions issued by physicians working in eastern Libya.

**Method** A total of 1,080 handwritten prescriptions were collected from pharmacies in different parts of the city of Derna and its suburbs in eastern Libya. After the exclusion of three prescriptions that were defined as illegible by the researchers, the 1,077 remaining prescriptions were examined for completeness against a checklist designed according to the guidelines of the World Health Organization (WHO).

**Results** Most of the prescriptions (84.12%) did not contain the name of the prescribing physician. The patient's name was not mentioned on 16.06% of the prescriptions. Patient-related information was missing in most of the prescriptions. Most of the physicians (91.27%) prescribed drugs using their trade names. Drug strength, route of drug administration, and duration of therapy were absent in 29.61, 87, and 56.17% of the prescriptions, respectively. Only 26% of the prescriptions contained the date.

**Conclusion** Most of the prescriptions inspected in this study had some deficiencies and did not adhere to the WHO guidelines.

## Keywords

- ▶ handwritten prescriptions
- ▶ legibility
- ▶ medication errors
- ▶ Libya

article published online  
June 12, 2023

DOI <https://doi.org/10.1055/s-0043-1768932>.  
ISSN 2519-139X.

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## ملخص المقال باللغة العربية

## تقييم استيفاء الشروط للوصفات الطبية المكتوبة بخط اليد في شرق ليبيا

## المؤلفون:

أميرة بواويقي، نسرين الحصادي، هناء الزاوي، رحاب رمضان، روعة البرعصي، كلية الصيدلة جامعة

درنة، درنة، ليبيا

المؤلف المسؤول: أميرة أبوويقي، البريد الإلكتروني: [e.bousoik@uod.edu.ly](mailto:e.bousoik@uod.edu.ly)

الخلفية: يجب كتابة الوصفات الطبية والوثائق الطبية القانونية الصادرة عن الأطباء للمرضى بدقة ووضوح، كما أنها يجب أن تحتوي على جميع المعلومات المطلوبة، والالتزام بالإرشادات الخاصة بكتابة الوصفات الطبية الصادرة من منظمة الصحة العالمية. في شرق ليبيا، معظم الوصفات الطبية تكتب بخط اليد. قد تؤدي الوصفات الطبية غير المكتملة إلى أخطاء طبية خطيرة.

الهدف: تقييم اكتمال الوصفات المكتوبة بخط اليد الصادرة عن الأطباء العاملين في شرق ليبيا.

الطريقة: تم جمع ما مجموعه 1080 وصفة مكتوبة بخط اليد من الصيدليات في مناطق مختلفة من مدينة درنة وضواحيها في شرق ليبيا. بعد استبعاد ثلاث وصفات طبية تم تعريفها على أنها غير مقروءة من قبل الباحثين، تم فحص 1077 وصفة طبية متبقية للتأكد من اكتمالها مقابل قائمة مرجعية مصممة وفقاً لإرشادات منظمة الصحة العالمية. تم تحليل النتائج باستخدام برنامج اكسيل وتقديمها على هيئة تكرارات ونسب مئوية.

النتائج: معظم الوصفات الطبية (84.1%) لا تحتوي على اسم الطبيب الذي وصفها. لم يذكر اسم المريض في 16.06% من الوصفات الطبية. كانت المعلومات المتعلقة بالمريض مفقودة في معظم الوصفات الطبية. وصف معظم الأطباء (91.27%) الأدوية بأسمائها التجارية. كانت قوة الدواء وطريقة تناول الدواء ومدة العلاج غائبة في 29.81% و 87% و 96.17% من الوصفات على التوالي. احتوت 28% فقط من الوصفات على تاريخ الوصفة.

الاستنتاجات: معظم الوصفات الطبية التي تم فحصها في هذه الدراسة بها بعض النواقص ولم تلتزم بإرشادات منظمة الصحة العالمية.

الكلمات المفتاحية: أخطاء الوصف، شرق ليبيا، وصفات مكتوبة بخط اليد، الأخطاء الطبية، منظمة الصحة العالمية.

## Introduction

Medication errors are among the most common types of medical errors, and they are considered the second cause of patient safety incidents that could lead to morbidity and mortality in the healthcare settings.<sup>1,2</sup> Prescription errors, which could arise from incomplete orders or incorrect instructions, account for about 70% of medication errors.<sup>1,3,4</sup> A prescription is a medicolegal document issued by a physician

to a patient and must be written accurately, clearly, and completely. It must also adhere to the guidelines for prescription writing.<sup>5,6</sup> According to the prescription guidelines of the World Health Organization (WHO), a prescription should contain the prescriber's information (name, address, contact phone number, and signature), the date, the patient's information (name, age and sex), and medication information (medication name, dose, duration of use, and frequency and route of administration).<sup>5</sup> Omission or incompleteness of any of

these elements could result in misinterpretation of the prescription by the pharmacist, and might lead to potentially serious medication errors.<sup>7</sup> Many studies suggested that an overall rate of incompleteness of handwritten prescription above 20% is unacceptably high.<sup>8</sup> Moreover, a large number of drugs in a prescription can result in an increase in the number of adverse drug effects and inappropriate or unsafe treatment.<sup>9,10</sup> Drug prescriptions in eastern Libya are largely handwritten, though electronic prescription software has been introduced at least in some cities. Therefore, there is a need to study the completeness of prescription information about the patient, the prescriber, and the drugs to minimize the occurrence of medication errors. Only one published study could be found on prescription legibility and completeness, and it was limited to ophthalmology clinics in the city of Benghazi, eastern Libya.<sup>11</sup> Therefore, the aim of this study was to assess the completeness of a sample of handwritten prescriptions issued in Derna and its suburbs in eastern Libya.

## Methods

This observational cross-sectional study was conducted in Derna and its suburbs, eastern Libya. Copies of 1080 handwritten were collected from pharmacies located in different parts of the city. After excluding three prescriptions that were defined as illegible by the researchers, the 1,077 remaining prescriptions were assessed for the presence of the essential elements.

A checklist based on the guidelines of the WHO was prepared.<sup>5</sup> Each prescription was assessed for the presence of specific items as shown below.

1. Prescriber details  
Name, signature, and contact telephone number
2. Patient details  
Name, age, sex, weight, and full address
3. Drug details  
Medication brand or generic name, medication strength, dosage form, drug dose, route of administration, and frequency and duration of treatment.
4. Other information  
Date of prescription

Deidentified data were entered from the prescriptions in an Excel sheet. Data were analyzed using Microsoft Excel 10. The results are presented as frequencies and percentages.

The researchers received permission to conduct the study from Ministry of Health, Derna. No personal information about patients or physicians was collected and strict confidentiality was observed.

## Results

After excluding prescriptions that were illegible by the researchers, a total number of 1,077 prescriptions were analyzed. None of these prescriptions contained all the items required for good prescription according to WHO

**Table 1** Missing prescription details specified in the World Health Organization guidelines

Type of information	Missing (n)	Missing (%)
<b>Prescriber information</b>		
Name	906	84.12
Contact telephone number	1,077	100
Signature	601	55.80
<b>Patient information</b>		
Name	173	16.06
Address	1,077	100
Age	780	72.42
Sex	1,065	98.88
Weight	1,025	95.17
<b>Medication information</b>		
Generic name	983	91.27
Dosage form	51	4.73
Strength	319	29.61
Dose	98	9.09
Frequency of administration	149	13.83
Duration of treatment	605	56.17

guidelines.<sup>5</sup> ▶Table 1 shows that the prescribers' names and signatures were present in 15.87 and 44.19% of the prescriptions, respectively. And only 64 prescriptions contained both the physicians' names and signatures. Moreover, none of the prescriptions contained the prescriber's contact phone number. ▶Table 1 also shows that 16.06% of the prescriptions lacked the patient's name, and 72.42% lacked the patient's age. Very few prescriptions contained the patient's weight (4.82%) or sex (1.11%). The patient's address was not present on any of the prescriptions. We found that the generic drug name was used in 8.26% and the brand name in 91.27% of prescriptions, while both names were written on the same prescriptions in only 0.46% of cases. Moreover, the strength of the drug was not mentioned in 319 prescriptions (29.61%) and the dose was not stated on 98 prescriptions (9.09%). Eighty seven percent of prescriptions lacked the route of administration, 13.83% lacked the drug frequency, and 56.17% lacked the treatment duration. In addition, the dosage form was missing in 51 prescriptions (4.73%).

Of the 1,077 prescriptions, 1,061 (98.51%) did not include the diagnosis and 797 (74%) had no date. Moreover, the number of prescribed medications ranged from one to eight and 35.93% of the prescriptions contained > 3 medications.

## Discussion

In this study, 1,077 prescriptions were verified for compliance with the WHO guidelines.<sup>5</sup> The name of prescribing physician was mentioned on 15.87% of the prescriptions, and only 44.19% of the prescribing physicians signed their prescriptions. The validity of prescriptions can be questioned by

pharmacists and other physicians to whom prescriptions are referred if prescriptions do not bear the prescriber's name with signature.

Notably, none of the prescriptions contained the prescriber's contact information.

If the prescribers' contact information is not available, they cannot be contacted about potential prescription errors. However, since there are no reliable secretarial services in most of the clinics in Libya, the physician is not entirely responsible for the omission. According to the WHO, prescriptions should contain patients' names. This is essential for any needed follow-up and to minimize the risk of serious medication errors, such as dispensing medication to someone other than the intended patient. Although the patient's name was mentioned on 83.93% of the prescriptions in our study, this issue should be further emphasized and should be put as an obligatory condition to dispense a prescription by all pharmacies in Libya.

In this study, the age of the patient was mentioned in only 27.57% of the prescriptions. It is, however, higher than a study carried out in Benghazi Ophthalmology Clinic, where the patient's age was mentioned in less than 15% of handwritten prescriptions.<sup>11</sup> The absence of the patient's weight in 95.17% of the prescriptions in our study is practically identical to that reported in a Saudi Arabian study (96.8%).<sup>12</sup> The patient's age and weight are used in dose determination, enabling the pharmacist to check if the written dose is appropriate.<sup>13</sup> Herein, 264 of prescriptions were for pediatric patients, of which 116 (43.93%) did not contain the patient's age, while 212 of them (80.30%) did not contain the patient's weight.

It is essential to include the patient's sex on prescriptions because some medicines are given only to males or only to females. This study showed that only 12 of 1077 prescriptions (1.11%) mentioned the sex of the patient. This error in patient information is similar to that reported by Kutrani et al who found that 2.1% prescriptions include patient sex.<sup>11</sup> According to the WHO guidelines, the patient's address is an essential element that should be present in prescriptions.<sup>5</sup> In our study, the patient's address was not mentioned in any of the prescriptions. This finding is similar to study conducted by Erhun et al, wherein patients address was mentioned in only 1.8% of prescriptions.<sup>14</sup>

According to the WHO, drugs should be prescribed by their generic names. This practice gives pharmacists the chance to select the most cost-effective and efficacious medications for their patients, and to avoid dispensing unnecessary and expensive medicines. In this study, the generic name of the drug was absent in 91.27% of the prescriptions, which is considerably higher than that reported by a Malaysian study (45.2%).<sup>15</sup>

Missing drug identifications on prescriptions affect their accuracy and can cause them to be misinterpreted. In this study, the drug dosage form was absent in 4.73% of the prescriptions and the drug strength was absent in 29.61%. In a similar Saudi Arabia study, results indicated the absence of identification of drug strength in 27.6% of prescriptions.<sup>12</sup> It is important to indicate the strength and dosage form of a

drug, especially when the drug is available in various strengths or dosage forms. Herein, 23.19% of the prescriptions that did not indicate drug strength contained drugs that are available in various strengths, while 60.78% of the prescriptions that did not indicate dosage forms contained drugs that are available in various dosage forms. Physicians should prescribe drugs to patients at the appropriate doses to obtain desirable effects and to minimize side effects. This study showed that 9.09% of the prescriptions had no information on dose. This percentage is higher than that reported in the Saudi Arabian study, in which only 3.6% of prescriptions lacked dose information.<sup>12</sup> The pharmacist calculates the quantity of medication to be dispensed to the patient based on doses, dosage regimen, and duration of administration. If any of these is missing, there is a possibility that the patient might end up with an under dose or an overdose. We found that 13.83% of the prescriptions lacked dosing frequency, while the duration of medication was absent in 56.17%. In contrast, a study in Saudi Arabia showed that the frequency and duration of medication were missing in 6.87 and 42.62% of prescriptions, respectively.<sup>16</sup> Interestingly, we observed that 8.59% of the prescriptions that lacked the duration of therapy were prescribed for chronic diseases. Even for chronic diseases, time for prescription refill should be clearly stated because doses and drugs may need to be altered in accordance with patient's physiology or prognosis. We also observed that most of the physicians did not include the duration of medication use when prescribed as needed. Herein, 10% of prescriptions that do not mention the duration of medication were prescribed as needed. Moreover, we found that 87% of the prescriptions did not indicate the route of administration. Specifying the route of administration is particularly important if the drug can be administered through different routes. Using the wrong administration route can have serious consequences. A recent study reported that patients were given a medication to treat a respiratory disease intravenously instead of by inhalation, which resulted in a dose five times higher than the required dose and caused severe cardiovascular complications.<sup>17</sup> Our study showed that this information is lacking, possibly because most prescribed medicines are available in a single dosage form thus administered through only one route. Clinical diagnosis is not listed as a prescription requirement in the WHO guidelines. Hospital prescription regulations recommend including the diagnosis of the patient in the prescription, as it may help pharmacists to interpret the correct drug when the handwriting is not clearly legible.<sup>5,18</sup> Our study indicates that 98.51% of the prescriptions did not specify the diagnosis. This comes in contrast with what was found in a Saudi Arabian study, where diagnosis was missing in 27.25% of the prescriptions.<sup>16</sup> The date on which a prescription is issued is very important because it helps pharmacists to know the validity of the prescription and to avoid unnecessarily prescription refill. Furthermore, the date of the prescription can be legally crucial, especially if the medication causes harm or death. It is notable that though dates are an important part of our daily lives, the physicians did not bother with it in 74% of the prescriptions. Almost

35.93% of the prescriptions contained more than 3 drugs, indicating that the prescribing physicians had a tendency towards polypharmacy. This is a higher percentage than reported by Sah et al and Tayem et al.<sup>19,20</sup>

## Conclusion

Our results show that some deficiencies and lack of adherence to the WHO guidelines are the rule. Electronic prescriptions would greatly diminish and potentially eliminate this type of errors.

The findings of this study emphasized the need to improve prescribing practices in our community.

Although the results of this study cannot be generalized to all regions of the country, the study, however, represents a real cross-section of the whole country. Results are, therefore, indicative of the prescribing practices of the whole community. The study should, nevertheless, be corroborated with others in different regions of the country.

In conclusion, the results of this study suggest updating the prescription form to include all items recommended by the WHO, and implementing the use of electronic prescriptions throughout the entire country.

### Authors' Contributions

E.B helped in conceptualization and methodology; R.A. collected the prescriptions from pharmacies; N.A., H.A., R. R., and R.A. evaluated the prescriptions; E.B. analyzed the results and wrote the manuscript. All authors have read and agreed to the published version of the manuscript.

### Conflict of Interest

None declared.

### Acknowledgement

We thank Henda Mansour and Haneen Fadalallah, undergraduate students, who helped collecting the prescriptions from the pharmacies.

## References

- Rijal A, Gautam K, Rijal AS. Errors on a handwritten cardex: is it time for a change? *Nepal Med Coll J* 2011;13(04):267–271
- Krishna J, Singh AK, Goel S, et al. A preliminary study on profile and pattern of medication errors from a tertiary care teaching hospital. *Int Arch Integrat Med* 2015;2(07):94–98
- Joshi A, Buch J, Kothari N, Shah N. Evaluation of hand written and computerized outpatient prescriptions in urban part of Central Gujarat. *J Clin Diagn Res* 2016;10(06):FC01–FC05
- Velo GP, Minuz P. Medication errors: prescribing faults and prescription errors. *Br J Clin Pharmacol* 2009;67(06):624–628
- de Vries TP, Henning RH, Hogerzeil HV, Fresle DA. *Guide to Good Prescribing: A Practical Manual. Action Programme on Essential Drugs*. Geneva: World Health Organization; 1994. Available at: <http://www.apps.who.int/medicinedocs/pdf/whozip23e/whozip23e.pdf>. Accessed September 23, 2017
- Meyer TA. Improving the quality of the order-writing process for inpatient orders and outpatient prescriptions. *Am J Health Syst Pharm* 2000;57(Suppl 4):S18–S22
- Chen YF, Neil KE, Avery AJ, Dewey ME, Johnson C. Prescribing errors and other problems reported by community pharmacists. *Ther Clin Risk Manag* 2005;1(04):333–342
- Calligaris L, Panzera A, Arnoldo L, et al. Errors and omissions in hospital prescriptions: a survey of prescription writing in a hospital. *BMC Clin Pharmacol* 2009;9(01):9
- Shah BM, Hajjar ER. Polypharmacy, adverse drug reactions, and geriatric syndromes. *Clin Geriatr Med* 2012;28(02):173–186
- Rambhade S, Chakarborty A, Shrivastava A, Patil UK, Rambhade A. A survey on polypharmacy and use of inappropriate medications. *Toxicol Int* 2012;19(01):68–73
- Kutrani H, Eltarhuni A, Adouli LS, Elshelmane AA. Prescription Illegibility and Incompleteness Errors in Benghazi Ophthalmology Clinics: A Comparison of Handwritten and Computerized Prescriptions. *IOSR-JPBS* 2019;14 2278-3008:45- 51
- Raja MA, Aljuraisy MN, Alotaibi NM, Amjad MW. Analysis of degree of errors in handwritten medication prescriptions in Rafha, Saudi Arabia. *Trop J Pharm Res* 2019;18(06): 1347–1352
- Tang KL, Wimmer BC, Akkawi ME, Ming LC, Ibrahim B. Incidence and pattern of medication errors in a general paediatric ward in a developing nation. *Res Social Adm Pharm* 2018;14 (03):317–319
- Erhun WO, Adekoya OA, Erhun MO, Bamgbade OO. Legal issues in prescription writing: a study of two health institutions in Nigeria. *Int J Pharm Pract* 2009;17(03):189–193
- Al-Junid SM, Ezat WP, Surianti S. Prescribing patterns and drug cost among cardiovascular patients in Hospital Universiti Kebangsaan Malaysia. *Med J Malaysia* 2007;62(01):59–65
- Almoussa FI, Alhaqbani HH, Alsarra IA. Incomplete prescription and medication error in hospital practice: a Saudi local experience. *Int J Med Develop Count* 2020;4(07):1031–1035
- Villamanan E, Armada E, Larrubia Y, Ruano M, Moro M, Herrero A. Impact of computerized physician order entry on medication prescription errors in patients hospitalized in a chest diseases ward. *Pharm Anal Acta* 2014;5(05):1–5
- Albarrak AI, Al Rashidi EA, Fatani RK, Al Ageel SI, Mohammed R. Assessment of legibility and completeness of handwritten and electronic prescriptions. *Saudi Pharm J* 2014;22(06):522–527
- Sah N, Ramaiah B, Gupta AK, Thomas SM. Noncompliance with prescription-writing guidelines in an outpatient department of a tertiary care hospital: a prospective, observational study. *RGUHS J Pharm Sci* 2020;10(01):
- Tayem YI, Ibrahim MA, Qubaja MM, Shraim RK, Taha OB, Abu Shkhedem E. Compliance with the guidelines of prescription writing in a central hospital in the West Bank. *East Mediterr Health J* 2013;19(09):802–806