

## Original Article

# Prescription writing quality in paediatric teaching hospitals in Khartoum

Amira E. Abdellah (1), Sirageldin M. K. Abdelrahman (2)

(1) Arba weshreen Algurashi hospital

(2) Department of Paediatrics, Alzaiem Alazhari University

## ABSTRACT

This study was conducted to analyze the quality of prescription writing of doctors in outpatient departments of paediatric teaching hospitals in Khartoum.

This study is a descriptive cross-sectional, prospective, hospital based study. Nine hundred paediatric prescriptions collected from three paediatric teaching hospitals were analyzed. Three hundred prescriptions were also collected from doctors after giving them a case scenario for which they were asked to write appropriate prescriptions. These prescriptions were also analyzed for their completeness.

Inadequate writing of the sex of the patient, weight, and height were notable regarding patient information. Generic names, concentration of the drug and treatment duration of the drug were poorly mentioned. Designation and identification of the prescriber were not adequately mentioned. In the case scenario 65.3% of doctors wrote low quality prescriptions. Registrars wrote better prescriptions than medical officers who wrote better than house officers.

Outpatient department prescriptions were unsatisfactory due to lack of necessary information for the ideal prescription. Also doctors, in response

to case scenario, wrote low quality prescriptions.

To improve prescription writing skills, we suggest that hospitals should provide standard prescription forms that contain the necessary fields for identification of both, patient and doctor.

**Key words:** Prescription, quality, hospital, Khartoum.

## INTRODUCTION

Drug prescription is the product of most medical consultations. Despite the importance of good quality prescriptions erroneous prescribing habits are not uncommon worldwide [1]. Commonly, the term prescription is used to mean an order to take certain medications [2].

For several reasons, current methods of medical prescription suffer deficiencies. There is a lack of knowledge in clinical pharmacology among doctors and students [3]. The ideal prescription is composed of patient information which includes name, age, sex, weight, height and a diagnosis. Also it is composed of drug information which are generic name, formulation, concentration, dose, frequency, duration of treatment and treatment instructions. It should contain well written, and by clear hand writing the

### Correspondence to:

Dr Sirageldin M.Kheir

Department of Paediatrics

Alzaiem Alazhari University, Sudan.

Email: sirageldin89@hotmail.com

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prescriber name, signature and should have a date [4]. Prescriptions have legal implications, as they may indicate that the prescriber takes responsibility for the clinical care of the patient and in particular for monitoring efficacy and safety [4]. Prescription writing is an important aspect of medical practice. Illegible or incorrect prescription can result in loss of the patient, physician and pharmacist time and may cause therapeutic error or drug toxicity.

The objective of this study was to assess the quality of paediatric prescription written by doctors in hospitals out-patient, specifically to determine the nature of prescription deficiencies. Secondly, to compare prescription writing in this study with other studies in the country and internationally. Thirdly, to compare between the quality of prescription writing among doctor ranks.

## METHODS

This is a prospective, descriptive, cross-sectional hospital based study. The study was done in the three paediatric teaching hospitals in Khartoum, namely Gaffar Ibn Auf, Omdurman Paediatric Hospitals and Ahamed Gasim Paediatric Specialized Hospital. The study was carried out from 15th of February to the 15th of August 2010.

Inclusion criteria was prescriptions written to children less than 16 years, prescriptions written for out-patient children attendants and prescriptions written by junior doctors (not consultants). All other types of prescriptions not satisfying the inclusion criteria were excluded.

The sample size was calculated from the following formula:

$$n = \frac{z^2 \cdot p \cdot q}{d^2}$$

where  $z$  = the value in normal curve corresponding to level of confidence  $95\% = 1.96$

$p$  = probability prevalence in the community is  $20\%$  or  $0.2$

$$q = 1 - p = 1 - 0.2 = 0.8$$

$$d = \text{margin of error} = (0.05)$$

$$\text{therefore } n = \frac{z^2 \cdot p \cdot q}{d^2} = \frac{(1.96)^2 \times 0.2 \times 0.8}{(0.05)^2} = 246 \sim 300$$

First 300 prescriptions from each hospital were collected randomly and analyzed. Secondly, a case scenario was given to 300 doctors and they were asked to write a prescription for it. These were also collected and analyzed for their completeness.

Using simple random technique, prescriptions were collected from each hospital till the desired number was reached (300) from each hospital. Doctors of different jobs were randomly asked to write prescriptions to the case scenario in the same days during which prescriptions were collected.

A check list was used for the following items:

1. Regarding the patients information: full name (3 names were required), age, sex, weight, height and the diagnosis.
2. Regarding the drug: the generic name, dosage, concentrations, frequency, formulation, duration of treatment and instructions to the patient.
3. Regarding the prescriber: legality of hand writing, prescriber name and signature.
4. The date.
- 5.

### Ethical issue:

Doctors were assured verbally about the confidentiality of the study.

### Statistical Analysis:

Data were entered and analyzed using statistical package for social sciences (SPSS version 15). The difference between proportions statistical test was used to test statistical significance. It was considered significant when the  $p$  value is equal or less than  $0.05$ .

## RESULTS

The total number of prescriptions studied was 900. The patient full name (3 names required) was written in  $81.4\%$ , age in  $92.7\%$ , sex in  $33.3\%$ , the diagnosis

in 85.2%, the weight in 33.3% and the height was not registered at all (Table 1).

The drug generic name was mentioned in 39.4% of the prescriptions. Drug formulation in 77.7%, drug concentration in 60.3 %, drug dosage in 98.3%, drug frequency in 96.1%, duration of treatment in 80.6% and treatment instructions in 66.6% (Table 2).

Clear hand writing was noted in 92.1% of the

prescriptions, prescriber name was mentioned in 60.7%, signature in 29.6%, the prescription date was noted in 88.7% of prescriptions as shown in (Table 3). Only 34.7% of the doctors wrote complete prescriptions. Only 47%of the registrars, 34% of the medical officers and 23%of the house officers wrote a complete prescription (Table 4).

**Table 1- Comparison of patient information between hospitals.**

Hospital name	Full name No (%)	Patient age No (%)	Sex No (%)	Diagnosis No (%)	Weight No (%)
Gaafer Ibn Auof	300(100)	300(100)	300(100)	289(95.3)	300(100)
Ahmed Gasim	239(79.7)	283(94.3)	0(00)	250(83.3)	0(00)
Omdurman	194(64.7)	251(83.7)	0(00)	231(77)	0(00)
Total	733(81.4)	834(92.7)	300(33.3)	767(85.2)	300(33.3)

**Table 2- Comparison of drug information between hospitals.**

Hospital name	Drug generic name No (%)	Formulation No (%)	Concentration No (%)	Dose No (%)	Frequency No (%)	Duration of treatment No (%)	Treatment instructions (%) No
Gaafer Ibn Auof	110 (36.7)	269 (89.7)	284 (88)	294 (98)	296 (98.7)	283 (94.3)	(63) 189
Ahmed Gasim	126 (42)	210 (70)	141(47)	294 (98)	285 (95)	225(75)	(85.3) 255
Omdurman	119 (39.7)	220 (73.3)	138(46)	296 (98.7)	284 (94.7)	217 (72.3)	(51.6) 153
Total	355 (39.4)	699 (77.7)	543(60.3)	885 (98.3)	865 (96.1)	725 (80.6)	(66.6) 597

**Table 3- The prescriber information among hospitals.**

Hospital name	Clear hand writing No (%)	Prescriber oame No (%)	Prescriber signature No (%)	Prescription Date No (%)
Gaafer Ibn Auof	288(96)	262(87.3)	31(10.3)	289(96.3)
Ahmed Gasim	273(91)	146(48.7)	112(37.3)	254(84.7)
Omdurman	268(89.3)	138(46)	123(41)	255(85)
Total	829(92.1)	546(60.7)	266(29.6)	289(88.7)

**Table 4- Proportion of doctor's rank and prescription quality.**

Prescriber	Prescription	
	Complete No (%)	Incomplete No (%)
House officers	23(23.00)	77(77.00)
Medical officers	34(34.00)	66(66.00)
Registrars	47(47.00)	53(53.00)
Total	104(34.70)	196(65.30)

## DISCUSSION

In order for prescription to be ideal it should contain the essential elements of patient, drug and prescriber information. Incomplete prescription writing may lead to medication errors particularly in children. Children face the risk of medication error because of factors such as weight – based dosing , need for stock medicine dilution , decreased communications abilities of children , inability to self-administer the medication and the high vulnerability of young critically ill children to have injury from medication [5-7]. Hence, it is mandatory for a paediatric prescription to be of high quality, containing essential elements to avoid medication errors and its consequences. Analysis of this study concerning patient information shows that the full name is omitted in 18.6 % of the prescriptions. This makes them unidentifiable and can be wrongly issued to other patients. The patient's age is not mentioned in 7.3% of prescriptions and this makes it difficult for the pharmacist to check the dose. Sex and weight are not mentioned in 66.7% of the prescriptions. The name may give a clue to sex but reporting the weight is very important for the pharmacist to check the dose.

The diagnosis was not written in 14.8% of the prescriptions. It is important for checking the appropriateness of the drugs prescribed. An unacceptable omission (100%) is that of the height, which may be due to unavailability of height measurement machine .The height is essential to calculate the surface area which is

vital for calculating certain drugs (Table 1).

Comparing this study to a similar study conducted in Ribat University Hospital shows that writing of full name was found to be 81.4% in this study while in Ribat study it was reported to be 18.8%. Writing the patient age in our study is 92.7% while in Ribat study it was reported as 6.5%. Writing a diagnosis is 85.2% while it was found to be 6% in Ribat's study [2] .This means that the quality of prescription writing of this study is much better than that of the Ribat's study.

Concerning the drug information, omission of drug generic name was found in 60.6% of prescriptions .Generic name prescription will enable the patients to choose the cheapest effective drug while prescribing its trade name lead to loss of this opportunity .Drug formulations were omitted in 22.3%, drug concentration in 39.7%, drug dosage in 1.7%, drug frequency in 3.9%, drug duration in 19.4% and drug instructions in 33.4% of the prescriptions (Table 2). This shows that reporting drug information quality is low particularly in drug instructions, drug concentration and formulation. Drug concentration was lacking in 39.7% compared to that reported in a study done in Switzerland which is lacking in 33% [8]. As the dose is calculated according to specific concentration, this may lead to give high or low dose. Omission of treatment duration was found to be 19.4% which is significantly better than the Ribat study which is 25.7% while it was worse than that reported from the London study which was only

2.8% [9,10]. Errors in drug instructions include using complicated professional abbreviation like bd , t.d.s, or using the term (as directed ) .

Regarding the prescriber information, clear handwriting was lacking in 7.9% of the prescriptions .The prescriber name and signature were reported in 60.7% and 29.6% of the prescriptions respectively while that reported from an Arizona study was 91.7% and 97.3% respectively [11] .The date was omitted in 11.3% of the prescriptions.

It is obvious that the prescription writing is unsatisfactory because of the lack of essential elements of good prescription. The reason may be that in many hospitals, even the officially stamped prescription form lacks specific field of such items as weigh, height and surface area. Moreover, the education of doctors in prescription writing, rarely occurs in the class rooms. It occurs as on job training during clinical rotations and house officer training program. It is not known how long it takes to acquire this knowledge nor how extensive it is.

The results of prescription written in response to the case scenario were disappointing because incomplete prescription were identified in 65.3% of the total prescriptions (Table 4). Comparing this with that reported from Nigeria (18.6%) indicates that drug prescription is a neglected art in our medical practice even by the senior doctors [12].

Although the overall quality was deficient but registrars were found to write better prescriptions than medical officers who wrote better prescriptions than the house officers. Only 47% of registrars wrote complete prescription, 34% of the medical officers and only 23%of the house officers wrote complete prescriptions (Table 4). This is logical and shows the effect of experience and knowledge among different levels of the doctors. Hence training of junior doctors regarding prescription writing needs to be intensified in the continuous professional development sessions.

This study showed clearly the poor quality of

prescription writing by junior doctors. Unfortunately, there is little space for specific training in paediatric prescription during child health teaching in most medical schools [13]. The 2002 revision of Tomorrow Doctors clearly emphasized the need for knowledge and skills to enable safe and effective prescribing. However, the proposed core curriculum for teaching safe and effective prescription in medical schools refers specifically to children only briefly [14].

The following recommendations gathered from reviewing the literature might upgrade the skills of prescription writing; teaching and training in the medical schools along with similar training and supervision by the consultants and clinical tutors is highly recommended. Encouragement of inservice medical education and of prescription writing should be enhanced. The hospitals should provide standard prescription forms that contain the necessary fields for identification of both, patient and doctor, as well as required equipments ready to fill in the forms. Consultants in hospitals should be aware whether their juniors have knowledge about the action, dosage and side- effects of at least the commonly used drugs. Issuing of guidelines for prescribing for chronic diseases and emergencies should be encouraged.

Analysis of the results of the study show low quality of prescription writing in its all aspects of patient, drug and prescriber information .This is more obvious when comparing prescription writing items to international literature. Although the prescription writing quality is low, but still the senior doctors with some experience have got better writing quality compared to junior doctors.

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