



ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DEPARTMENT OF PEDIATRICS & CHILD HEALTH

**Quality of Pediatric Prescription Writing at the Department of
Pediatrics and Child Health Outpatient and Emergency Unit,
Tikur Anbessa Specialized Hospital**



A Research Report Submitted To the School Of Graduate Studies of Addis
Ababa University in Partial Fulfillment of the Requirements for Specialty
Certificate in Pediatrics and Child Health

By:

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OCTOBER, 2014

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DECLARATION

The Research is my original work, has not been presented for a degree in any other University and that all sources of materials used for the report have been acknowledged.

Fitsum W/Gebriel, MD.

This research report has been submitted for examination with my approval as university advisor.

Dr. Damte Shimelis

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Abbreviations and Acronyms

CPT	Clinical Pharmacology and Therapeutics
DACA	Drug Administration and Control Authority Ethiopia
MD	Medical doctor
ME	Medication error
OPD	Outpatient department
PCT	Primary Care Trust
ROPD	Regular Out Patient Department
WHO	World Health Organization

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Abstract

Introduction: Drugs are important components of health care and play crucial role in saving life. Drug prescription is the product of most medical consultations. Despite the importance of good quality prescriptions erroneous prescribing habits are not uncommon worldwide. Illegible or incorrect prescription can result in loss of the patient, physician and pharmacist time and may cause therapeutic error or drug toxicity. Hence the objective of this study was to assess the nature of prescription deficiencies (omission and error) in production of prescription with regard to Patient identification, drug information, prescriber's identification.

Methods: This was a prospective, cross-sectional hospital based study. All prescriptions issued to non admitted patients below 14 yrs of age visiting pediatric regular OPD, emergency and follow up clinics were collected from pediatric emergency and special clinic every day and assessed for their quality based on the nationally adopted format approved by Food Medicine and Healthcare Administration and Control Authority . Data was collected from May 1 to 31/2014 until the desired sample size is reached. Data was analyzed by SPSS for windows version 20.

Results: Total number of **prescription** studied was 246. With regard to patient identification, 78% of prescriptions were lack patient age, 80.5% sex and 86.2% patient weight. 50.8% of the prescriptions were without drug formulation and 19.9% drug generic name. 30% of the prescriptions were issued with erroneous dose. Prescribers name was not documented in 45.5% of the prescriptions and date of prescriptions issued was not written in 65% of the prescriptions. Based on the predefined

Conclusion and recommendation: From this study production of prescription quality is unsatisfactory as most of the prescriptions lack the essential elements. Patients are not well identified drug information is incomplete and prescribers identification is lacking in most of the prescriptions studied. And most of the prescriptions with poor quality are from clinics attended by senior residents. As a specialized teaching hospital the department should device corrective measure to enhance prescription quality, the hospital has to have prescription error reporting system and this calls for medication error study to evaluate the impact of prescription quality in the patient care.

Key words: Prescription, Quality; Handwriting, physicians

Introduction

Once a patient with a clinical problem has been evaluated and a diagnosis has been reached, the practitioner can often select from a variety of therapeutic approaches. Medication, surgery, psychiatric treatment, radiation, physical therapy, health education, counselling, further consultation, and no therapy are some of the options available. Of these options, drug therapy is by far the one most frequently chosen. In most cases, this requires the writing of a prescription.

A written prescription is the prescriber's order to prepare or dispense a specific treatment—usually medication—for a specific patient. When a patient comes for an office visit, the physician or other authorized health professional prescribes medications 67% of the time, and an average of one per office visit is written because more than one prescription may be written at a single visit.[1]

Like any other process in health care, writing of a prescription should be based on a series of rational steps. These include ; making a specific diagnosis ,considering the patho-physiologic implications of the diagnosis ,selecting a specific therapeutic objective, selecting a drug of choice , determining the appropriate dosing regimen and devise a plan for monitoring the drug's action and determine an end point for therapy.

Although a prescription can be written on any piece of paper (as long as all of the legal elements are present), it usually takes a specific form. The contents of that prescription are specified in the medical staff rules by the hospital's Pharmacy and Therapeutics Committee.[1]

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 prescriber name, signature and should have a date [2]. 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 [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].

Several types of prescribing errors are particularly common. These include errors involving omission of needed information; poor writing perhaps leading to errors of drug dose or timing; and prescription of drugs that are inappropriate for the specific situation.[1]

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 [4-6]. 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.

Literature Review

Drugs are important components of health care and play crucial role in saving life. The limited information available on drug use throughout the world indicated that drugs are not optimally used. [7] Drug prescription is the product of most medical consultations. Despite the importance of good quality prescriptions erroneous prescribing habits are not uncommon worldwide [8].

Medication errors (MEs) are major issues in health care and are probably one of the most common types of medical errors.[9,10] These events may occur due to professional practice, health care products, and procedures such as prescribing, dispensing, and administration. [9]

Moreover drug use in pediatric patients is a unique dilemma in the management and monitoring of disease since these age groups are unique populations with respect to how they metabolize, excrete and respond to drug therapy. Establishing safe and effective therapeutic regimens for children is challenging. From birth to adolescence pediatric patients are continually changed with respect to growth, psychosocial development, information on drug therapy is limited. The administration of drugs to children requires special knowledge and expertise primarily because the doses prescribed for children are often in an amount which is not commercially available in pediatric level.[11]

The potential inappropriate uses of medicines are becoming a concern worldwide with their increment in quantity and variety. Inappropriate use is associated with health risks to the patient and financial crisis to the health facilities and patients. As a result, numerous articles, conferences and studies try to address the issue and design strategies to identify, resolve and prevent inappropriate medicine use [12]. The rational use of medicines requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time and at the lowest cost to them and their community. However, ensuring the rational use of medicines remains a challenge for public health providers and administrators in many countries [13].

Medication errors can occur in any area of patient care and most research in this area has been done in adults. Children, however, may be at three times greater risk of medication errors compared to adults[14]. Reasons include the need to calculate doses on an individual basis based on age; weight; surface area; constantly changing pharmacokinetics and pharmacodynamics affecting ability to handle and respond to drugs; limited availability of prescribing information for many drugs and the need to

use unlicensed and off label drugs due to the lack of availability of suitable products for children. These factors lead to the need for complex calculations and manipulations; 10, 100 and 1000 fold errors have occurred with devastating Consequences[15,16].

The major consequences of MEs are patient morbidity and mortality.[17-19] MEs can affect patients, families, and health care providers indirectly because of cost implications, prolonged hospital stays, and psychological impact, since errors erode public confidence in the health care service.[19-20] However, data regarding MEs in Africa, especially in Ethiopia is scarce.

In the study conducted in 15 general practices in England with diverse characteristics from three primary care trust (PCTs) involving examination of the records of 1,777 patients was made . Of the 1,777 patients, 1,200 (67.5%) had at least one prescription during the 12 month retrospective review of their records.

The percentage prevalence of prescriptions with prescribing or monitoring errors was 4.9% (95% confidence intervals (CI) 4.4%-5.4%). The most common types of prescribing error were ‘incomplete information on the prescription’ (74; 30.0%); ‘dose/strength errors’ (44; 17.8%) and incorrect timing of doses (26; 10.5%). The most common type of monitoring error was ‘failure to request monitoring’ (38; 69.1%). [21]

Another study which was conducted in southern California on quality of prescription issued in busy pediatric emergency room. During the 32 days of study 4,364 prescriptions were written for 2,403 patients by 18 physicians and filled by 9 pharmacists ;of the eligible prescriptions ,only 110 or 5 percent contained no error or omissions. The proportion of prescription that were incomplete because a physician omitted a specification ranged from 25 to 95 percent. An additional 12 to 14 months of pediatric training appeared to have no influence on the ability of the prescription writers to calculate dosage or estimate quantity. The residents made as many mistakes as in dosage and instruction as the interns who had graduated relatively recently. The residents also made more errors in quantity and timing.

Did the pharmacist working under pressure to fill a large number of prescription as quickly as possible ,monitor the doses ,quantity ,or time interval. Of the 303 prescriptions which called for incorrect quantities of drugs ,the pharmacist failed to to make any change in 214 or 70.6 % and actually made incorrect changes in 31 or 10.2 % . Of 475 prescriptions with incorrect dosages,the pharmacist made changes in 46 or 9.6 %;however ,half of these changes were also incorrect .Of 906 prescriptions containing correct dosage ,the pharmacist changed 26 or 2.9% incorrectly. [22]

From studies conducted in Africa, the study conducted in Nigeria on Interns' knowledge of clinical pharmacology and therapeutics after undergraduate and on-going internship is the earliest to indicate deficiency in prescription writing. The study involved a total of 100 interns who were randomly

selected from the Lagos State University Teaching Hospital. The response rate was 81%. All the respondents graduated from universities in Nigeria. The ability of the interns to prescribe rationally (66, 81.4%) and safely (47, 58%) was provided by undergraduate CPT teaching. However forty two (51.8%) respondents had problems with prescription writing.[23]

A recent article on prescription writing quality in pediatric teaching hospital in Khartoum where a total 900 prescriptions studied ; 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. 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%. Clear hand writing was noted in 92.1% of the prescriptions, prescriber name was mentioned in 60.7%, signature in 29.6%, and the prescription date was noted in 88.7% of prescriptions. Generally 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. [24]

Objectives

General Objective

The general objective of this study was to assess the quality of pediatric prescription written by doctors and interns in the hospital out-patient department, follow up clinics and ER.

Specific Objectives

The specific objectives of this study is

1. To assess the quality of prescription in terms of completeness of patient information.
2. To assess the quality of the prescription in terms of completeness and correctness of drug information.
3. To assess the quality of prescription in terms of completeness of prescribers information.
4. To assess determinant factors of prescription quality

Materials and Methods

Study Setting and period: - The study was conducted at Addis Ababa University, Department of Pediatrics and child Health, Tikur Anbessa specialized Hospital, at pediatric out patient, emergency, follow up clinics ,pediatric emergency and special pharmacy.

Source Population: - all prescriptions issued to patients visiting pediatric OPD, emergency and follow up clinics from May 1-31/2014 .

Study population- All prescriptions issued to non admitted patients below 14 yrs of age visiting pediatric OPD, emergency and follow up clinic from May 1-31/2014.

Design

This is a prospective, cross- sectional hospital based study. Determines deficiencies of prescriptions issued for patients visiting Tikur Anbessa specialized hospital Department of Paediatrics and Child Health regular OPD ,emergency and follow up clinics based on the national standard prescription format adopted by FMHACA formerly known as DACA. Registration number, date, sex, age ,weight, diagnosis and type of medication was registered on individual check list from the charts of every patient for whom hospital pharmacy available drugs during the study period was documented. For the same patient the prescription paper was marked at the top with a registration unique number and name of the specific clinic that the patient was seen so that every prescription could be identified at pharmacy.

Such marked prescriptions was collected at both pharmacies (Paediatric emergency and Special pharmacy) every day. Each prescription was checked for completeness and correctness of the standard parameters to be filled based on FMHACA approved prescription paper. (25)

Inclusion criteria

- New or refill prescriptions issued to non admitted children less than 14 years of age.
- Prescriptions issued for the available drugs in the hospital pharmacy during the study period.

Exclusion Criteria

- Any prescription registered and marked at OPD for Which drug is not dispensed on the same day as prescription issued.
- Prescription issued from 5 pm to 8am on each working day.
- Prescriptions from Paediatric ART and Endocrine clinic.

Sample size

The sample size was calculated from the following formula after obtaining prevalence of poor prescription quality from pilot study conducted in the same setup to be 20%!

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

where z = the value in normal curve corresponding to level of confidence 95% = 1.96
 p = prevalence of poor prescription quality 20% or 0.2
 $q = 1 - p = 1 - 0.2 = 0.8$
 d = margin of error = (0.05)

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

Using non probability technique, prescriptions were collected from the hospital till the desired number is reached (246).

A check list is used to be asses for completeness of the following components:

1. Patients information: full name (2 names are required), age, sex, weight, and the diagnosis.
2. Drug information: the generic name, dosage, concentrations, frequency, formulation and duration of treatment .
3. Prescriber Identification: clarity; of hand writing, prescriber name and signature.
4. The date.

Data collection

Registration number ,date, sex, age, .weight ,diagnosis and type of medication was filled on the individual check list from chart of every patient for whom hospital available drug was prescribe on working days from 8am till 5pm .This was done by trained clinical nurses . Then each prescription was marked at the back with a unique registration number with the name of respective clinic sequentially for it to be identified at the pharmacy.

Each check list was evaluated by paediatric consultant independent of OPD for the study period for appropriateness of the specific drug prescribed based on the hospital protocol.

At 5pm every marked prescription was collected from Paediatric Emergency and Special pharmacy by trained pharmacists and was assessed (against FMHACA approved prescription format and drug dosage and preparation from Nelson Text book of paediatrics 19th edition)(25,26)for completeness and error by the same check list used in the clinics during the day.

Proper data collection was checked by principal investigator every day and problems identified through the process was addressed on daily bases.

Definition

No single definition is currently being used to determine medication error though attempts to develop an international definition has been made in different studies (27,28).

Hence in this study prescription error was considered to have occurred if

1. Patient information (registration number, full name, age sex weight and diagnosis) was incorrectly documented on the prescription when compared against the data from patient chart.
2. Drug information (generic name, dosage, concentration, frequency, formulation and duration of therapy) was incorrectly issued when checked against recommended parameters on Nelson Text book of paediatrics 19th edition (26)

Omission

Was considered to occur when essential elements of Prescription(25) were lacking .

Prescription quality was rated as good or poor in this study. Based on the definition of good prescribing practice i.e. prescribing the right medicine for the right patient ,in the right dosage of the right **formulation for the right length of time.**

In this study prescription quality was considered to be good if it was issued for the right patient, in the right dosage, formulation and length of time. Was considered to be poor if any of the above parameters were lacking in the prescription issued.

Ethical issue:

Doctors and dispensing pharmacists were assured verbally about the confidentiality of the study.

Data analysis

The variables of interest in this research were as follow

- 1- Independent variable – age, sex, weight, diagnosis and type of drug prescribed.
- 2- Dependent variable / outcome variable –omission, error and quality of correction made by dispensing pharmacist.

Data was entered and analyzed using statistical package for social sciences (SPSS version 20). Logistic regression was used to determine association between dependent and independent variables

Benefits and beneficiaries

The outcome of research helps the hospital and health care providers in general to know the quality of prescription issued which may indicate a significant medication error . The finding can be used to take corrective measure in quality control of drug used in the paediatric practice. It can also serve as a reference to conduct other researches in the field of concern.

Ethical Clearance

The study was conducted after obtaining ethical clearance from the Department of Pediatrics and Child health ,Addis Ababa University, Medical Faculty. Anything that could break the anonymity of the individual was avoided including name. Verbal consent was obtained from the respondents and confidentiality was assured. The right of the respondent to withdraw from the study was respected. Detailed descriptions of the purpose of the study was explained to the participant before they were enrolled and agree to participate.

Plan for Dissemination

Formal report is submitted to pediatrics and child health department and all concerned bodies.

RESULTS

The total number of prescriptions studied was 246. Of the 246 prescriptions ; 3.6 % of the prescription was issued for infants below two months of age ,11.4% for 2-12 months,34.6% for 12-59months and 50.4% for those 59-168months old. 52.8% of the prescription is issued for male patients and 47.2% for female patients .(Table 1)

Age of patient in month	Sex		Total	
	Male	Female		
< 2	5	4	9	(3.6%)
2-12	13	15	28	(11.4%)
12-60	52	33	85	(34.6%)
60-168	60	64	124	(50.4%)
Total	130 (52.8%)	116 (47.2%)	246	

Table 1: Distribution of patient prescription by Age and Sex .TASH, AA, Ethiopia 2014.

1. Completeness of patient information

Patient full name was documented in 98.4% of the prescriptions, age in 22%, sex in 19.5% ,weight in 13.8% ,diagnosis in 34.1% and registration number in 50.4% of prescriptions . (Table 2)

	Full Name	Age	Sex	Weight	Diagnoses	Registration no.
omitted	4(1.6%)	192(78%)	198(80.5%)	212(86.2%)	162(65.9%)	122(49.6%)
documented	242(98.4%)	54(22%)	48(19.5%)	34(13.8%)	84(34.1%)	124(50.4%)
Total	246	246	246	246	246	246

Table: 2 Distribution of prescription by completeness of patient information. TASH,AA, Ethiopia.2014

2. Completeness of drug information

Drug generic name was documented in 80.1 % of the prescription ,formulation in 49.2%,concentration in 91.1%, frequency in 89.5% and duration of treatment in 90.7% of the prescriptions .(Table3)

	Drug generic name	Formulation	Concentration	Frequency	Duration of treatment
Omitted	49(19.9%)	125(50.8%)	22(8.9%)	26(10.5%)	23(9.3%)
Documented	197(80.1%)	121(49.2%)	224(91.1%)	220(89.5%)	223(90.7%)
Total	246	246	246	246	246

Table: 3 Distribution of prescriptions by Completeness of Drug information.TASH,AA,Ethiopia.2014

3. Error and omission in drug information

Drug dose was omitted in 7% of the prescriptions and error in dosing was noted in 30% of the prescriptions .(fig. 1)

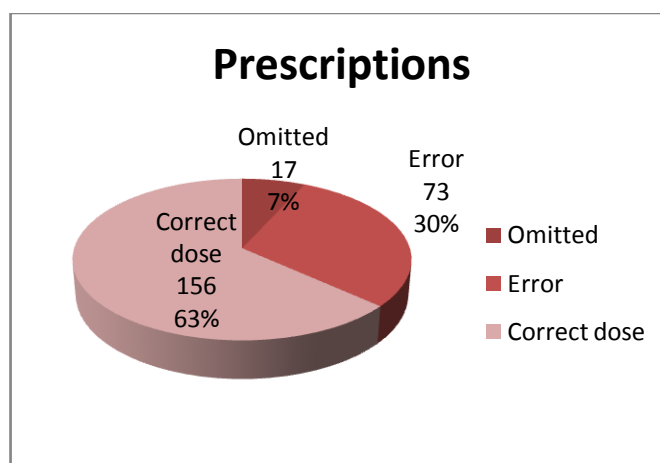


Figure: 1. Distribution of prescription by completeness and correctness of dosage .TASH, AA, Ethiopia 2014

Of the prescriptions with error in dosing 42.5% was for prophylactic antibiotic, 28.7% diuretics, 11% therapeutic antibiotic, 9.6% anti-inflammatory, 5.5 anti convulsant and 2.7% other class of drug.

Of the prescription with omitted doses; 64.7% was for bronchodilators, 29.4% for prophylactic antibiotics and 59% therapeutic antibiotics. (table 4)

Group drugs prescribed	Dose			Total
	Omitted	Error	Correct dosing	
Antibiotic(prophylactic)	5 (29.4%)	31 (42.5%)	20 (12.8%)	56 (22.8%)
Antibiotic (Therapeutic)	1 (5.9%)	8 (11%)	11 (7.1%)	20 (8.1%)
Anti-inflammatory	0	7 (9.6%)	13 (8.3%)	20 (8.1%)
Diuretics	0	21 (28.7%)	24 (15.4%)	45 (18.3%)
ACEI	0	0	10(6.4%)	10 (4%)
Bronchodilator	11 (64.7%)	0	6 (3.8%)	17 (7%)
Anticonvulsant	0	4 (5.5%)	48 (30.7%)	52 (21.2%)
Chemotherapeutic agents	0	0	11(7.1%)	11 (4.5%)
others	0	2 (2.7%)	13 (8.3%)	15 (6%)
Total	17	73	156	246

Table:4 Group of Drug Vs completeness/ correctness of Dosage. TASH ,AA, Ethiopia 20142014

46.6% of drugs with error in dosing was issued from oncology /hematology clinic, 27.4 %cardiac clinic, 8.2% renal clinic ,5.5% neurology, 5.4% ER, 5.4% ROPD and 1.4% HRIC. (fig.2)

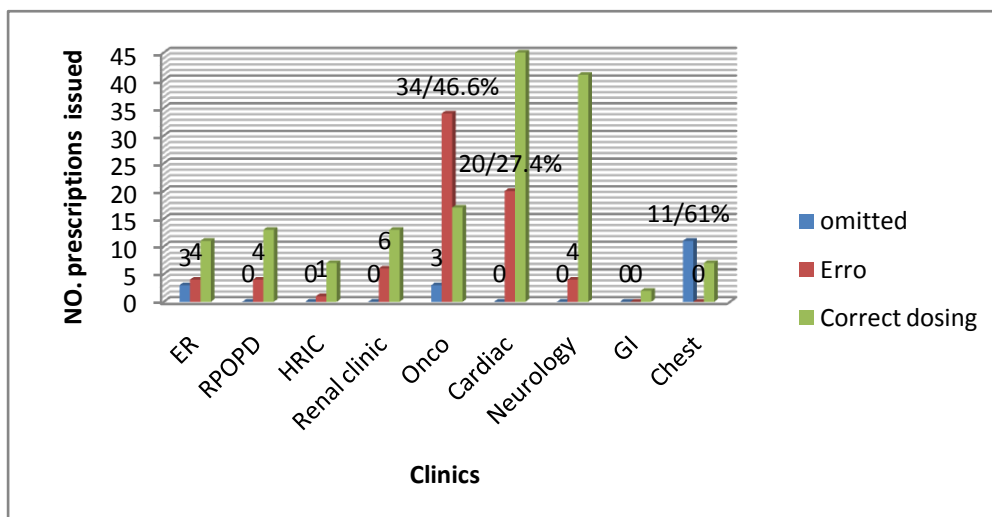


Figure 2: clinics prescriptions issued Vs dosing omission/ error TASH, AA, Ethiopia 2014

4. Completeness of prescribers information

Clear hand writing was noted in 85.5% of the prescriptions, prescribers name was mentioned in 54.5%, prescribers rank in 42.7% signature in 82.1%and date in only 37% on the prescriptions.(table 5)

	Clear Hand writing	Name	Rank	Signature	date
Yes	210(85.5%)	134(54.5%)	105(42.7%)	202(82.1%)	91(37%)
No	36(14.5%)	112(45.5%)	141(57.3%)	44(17.9%)	155(63%)

Table 5: Distribution of prescription by Completeness of prescriber's information. TASH, AA, Ethiopia. 2014

5. Quality of prescription

Of the 246 prescriptions studied ,based on the operational definition provided above 60% of the prescriptions were assessed to have good quality.

Base on the respective age of patients seen in each clinic, 33% of the prescriptions issued for those less than 2month bear poor quality, 32%, 39%,42% for those 2-12 month,12-59 month and 59-168month respectively.

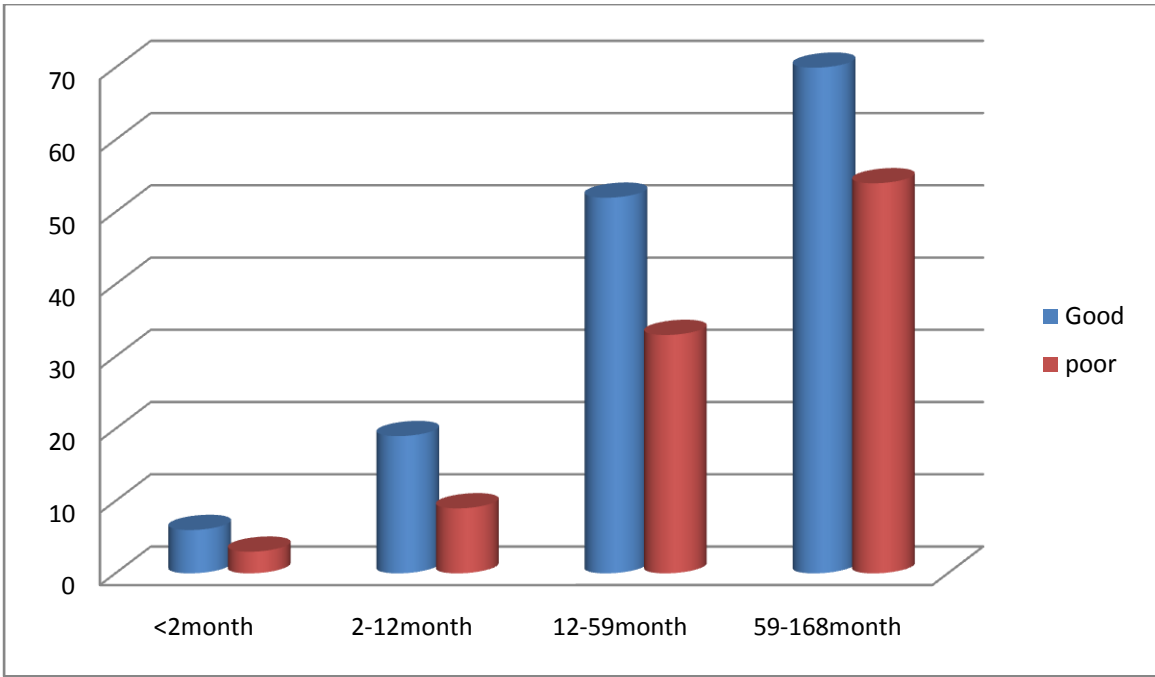


Figure 3: Quality of prescription issued for different age groups TASH, AA, Ethiopia 2014

Of the group of drugs where prescriptions were issued 68% of prescriptions for prophylactic antibiotics bear poor quality 65%,55% for anti-inflammatory and therapeutic doses of antibiotics respectively. And relatively good quality prescription was issued for bronchodilators(82%),Anticonvulsant chemotherapeutic agents (81% each).

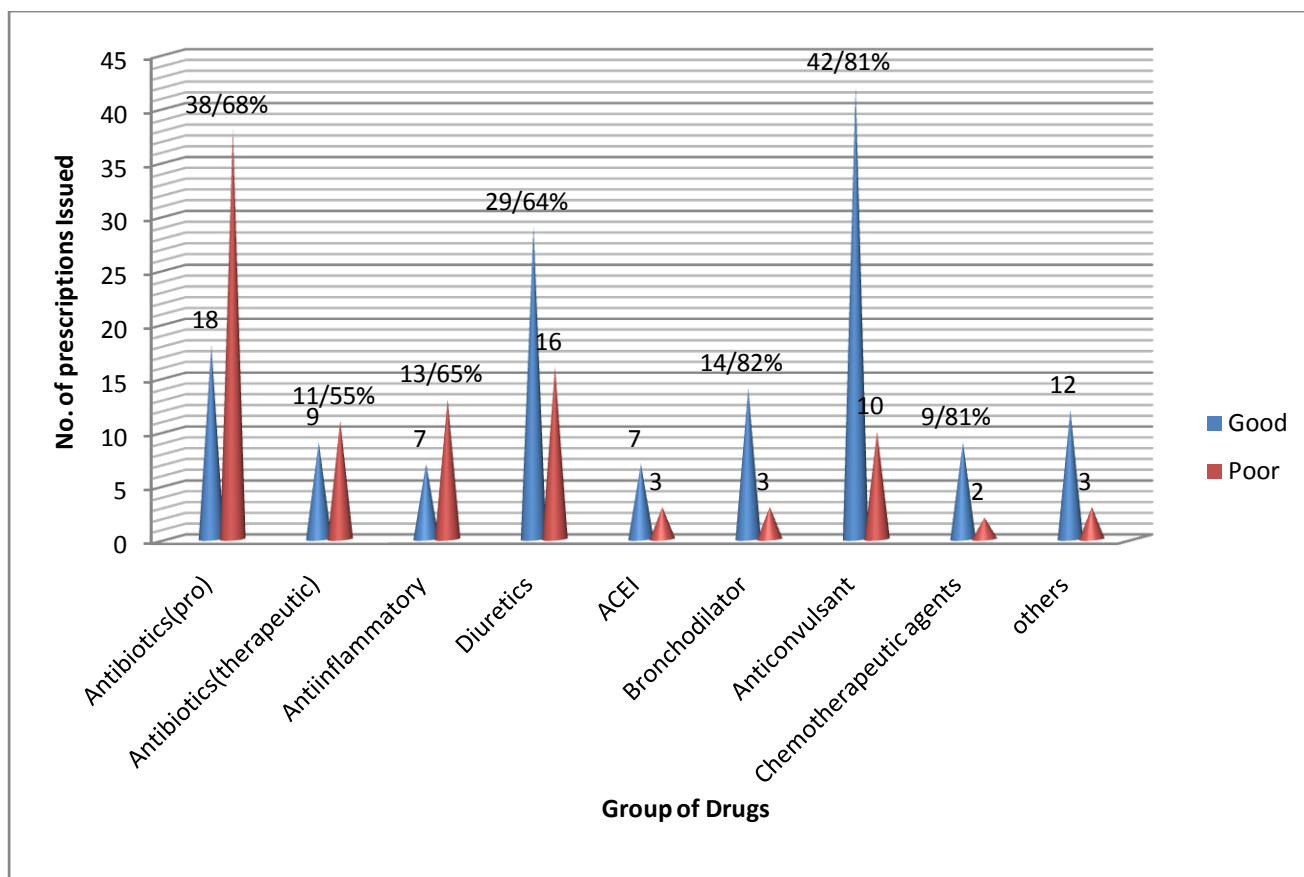


Figure 3: Quality of prescription issued for different groups of drugs TASH, AA, Ethiopia 2014

With regards to the clinics where the prescription were issued it was assessed that prescriptions issued from GI clinic,chest clinic,neurology clinic and ER contained good prescription quality while those issued from Oncology/Hematology clinic,ROPD and renal clinic bear poor quality.(table 6)

	Good quality(%)	Poor quality(%)	total
ER	13 (72)	5 (28)	18
RPOPD	9 (53)	8 (47)	17
HRIC	5 (63)	3 (37)	8
Renal clinic	10 (53)	9 (47)	19
oncology/hematology	14 (26)	40 (74)	54
cardiac clinic	42 (65)	23 (35)	65
Neurology clinic	36 (80)	9 (20)	45
GI Clinic	2 (100)	-	2
chest clinic	16 (89)	2(11)	18
total	147	99	246

Table 6 . Quality of prescription issued from different clinics . TASH, AA, Ethiopia. 2014

Determinant factor for prescription quality was analyzed with logistic regression but association was not found.

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 [4-6]. Hence, it is mandatory for a paediatric prescription to be of high quality, containing essential elements to avoid medication errors and its consequences.

Comparing this study to a similar study conducted in three of the paediatric teaching hospitals in Khartoum , writing of full name was found to be 98.4% in this study while in Khartoum study it was reported to be 81.4%(24) . Writing the patient age in this study is 22% while in Khartoum study it was reported as 92.7% . Writing a diagnosis is 34.1% while it was found to be 85.2% in Khartoum's study .This means that the quality of prescription writing of this study with regard to patient identification with exception of patient full name is worse than that of the Khartoum's study.

Concerning the drug information, omission of drug generic name was found in 19.9% 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. This is much better than one noted in the Khartoum's study which is 60.6% .Drug formulations were omitted in 50.8% as compared to 22.3%, drug concentration in 8.9% Vs 39.7%, drug dosage in 7% vs 1.7%, drug frequency in 10.5% vs 3.9%, drug duration in 9.3 % vs 19.4% seen in the Khartoum study . This shows that reporting drug information quality is low particularly in drug formulation , dosage and frequency. Drug concentration was lacking in 8.9% compared to that reported in a study done in Switzerland which is lacking in 33% [25]. 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 9.3% which is significantly better than the Ribat study(2) which is 25.7% while it was worse than that reported from the London study which was only 2.8% [21-24,29-31].

Regarding the prescriber information, clear handwriting was lacking in 14.5%,which is higher than seen in the Khartoum study(7.9% of the prescriptions) .The prescriber name and signature were reported in 54.5% and 82.1% of the prescriptions as compared to the Khartoum study which showed

60.7% and 29.6% of the prescriptions respectively . This is lower than the Arizona study where prescribers name and signature was noted in 91.7% and 97.3% respectively [32] .The date was omitted in 63%as compared to the Khartoum study where omission of date was reported to be 11.3% .Though comparison was not made due to lack of similar studies, 42.5% of prophylactic antibiotics ,28.7% of diuretics and 11% of therapeutic doses of antibiotics bearing prescriptions were issued with wrong dose . Among the medications with the wrong dosage ,46.6% of medications were issued from Oncology clinic and 27.4% from cardiac clinic. As discussed in the methodology segment for lack of consensus on standard definition of good/poor prescription quality, comparison of our finding is not compared with other studies .

Conclusion

From this study prescription production is unsatisfactory because of the lack of essential elements of good prescription. Patients' identification and drug information is poorly documented. Though it is mandatory to formally identify prescriber by his/ her name, rank and signature, most of the essential elements of prescriber's identifications were omitted. The extent of poor quality of the prescriptions has lead to production of prescriptions with wrong dose which though it needs study might have an impact on patient care.

Recommendation

Great emphasis should be give for production of prescription in our clinical practice .The department should provide formal lessons to undergraduate students with regard to production of pediatric prescription .The Hospital should adopt the standard format of prescription recommended by FMHACA and assign pharmacists who are of great help in the inpatient care to the OPDS and respective clinics .Documented corrective measures should be taken as a formal practice among dispensing pharmacists .

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Check List

(To be filled by clinical nurse)

Registration number _____ date _____ sex _____ age _____ weight _____

Diagnosis _____

Drug Prescribed _____

(To be checked by paediatric consultant)

Drug type appropriate for the diagnosis

Yes _____

No _____

(To be checked by pharmacist from marked prescriptions)

Parameters	Omitted	Error	Correction made by pharmacist on
Registration no.			
Full name (patient and father's name)			
Age			
Sex			
Weight			
Diagnosis			
Generic name			
Dosage			
Concentration			
Frequency			
Formulation			
Duration of treatment			
Prescriber			
Legality of hand writing	Able to read with ease	Unable to read with ease	
Name			
Rank			
Signature			
Date			

Annex-1 Standard prescription paper

PRESCRIPTION PAPER

Code _____

Institution Name: _____ Tel. No... ..

Patient's full Name: _____

Sex: ___ Age: ___ Weight: _____ Card No. _____

Region: _____ Town _____ Woreda _____ Kebele _____

House No. _____ Tel. No: _____ Inpatient Outpatient

Diagnosis, if not ICD _____

Drug Name, Strength, Dosage Form, Dose, Frequency, Duration, Quantity, How to use & other information	Price (dispensers use only)
Rx	
Total Price	

	Prescriber's		Dispenser's
Full name	_____	_____	_____
Qualification	_____	_____	_____
Registration #	_____	_____	_____
Signature	_____	_____	_____
Date:	_____	_____	_____

See overleaf