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ASSESSMENT OF PRESCRIBERS ADHERENCE TO THE BASIC STANDARDS OF PRESCRIPTION ORDER WRITING IN SERBO AND ASSENDABO HEALTH CENTERS, JIMMA ZONE, SOUTH WEST ETHIOPIA

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ABSTRACT

Background: Since prescribing is the first and foremost component in the process of using drugs, it is a vital element in rational drug use. The concept of rational prescribing requires that the prescriber follows correct and complete prescription writing.

Objective: To assess prescribers adherence to the basic standards of prescription order writing in Serbo and Assendao health centers.

Methodology: In this retrospective study, a total of 424 prescriptions were selected as a sample from the two health centers using systematic random sampling technique and data was collected using pre-tested format from January 3 to 28,2007.

Result: In 3.3%, 4.7%, 70.8%, and 4.7%, 18.9%, 82.1% of the prescriptions, respectively, Age, Sex and card no of patients were not recorded. In 24.5%, 33% and 55.2%, 93.9% of the prescriptions date and signature of the prescriber were omitted, respectively. In 85% of the prescriptions, address of the patient was omitted in Serbo health center, but none of the prescriptions contained address of the patient in Assendabo health center. Out of the prescribed drugs, 43.4%, 39.8%, 14.3% and 33%, 47.8%, 10.3% of the drugs respectively, didn't indicate the strength, dosage form and doses. In 20.7%, 38.6%, 4.8%and 15.6%, 32.7%, 5.3% of the prescribed drugs, frequency of administration, route of administration, and total quantity of drugs or length of treatment course were omitted, respectively. Out of the prescribed drugs 64.3% and 61.2% were written in Generic names.8% and 3.8% of the prescriptions were found to be illegible, and in both health centers, no prescription had special advice or warning.

Conclusion: The finding of this study showed that, in General, there is poor adherence to the basic standards of prescription order writing in both health centers. In order to improve adherence, various educational, managerial and regulatory interventions should be designed and implemented by the concerned technical and administrative bodies.

INTRODUCTION: A prescription is a written, verbal or electronic order from a prescriber to a dispenser designating a specific medication for a particular patient at a specified time. A prescription should be clear, legible and should indicate precisely what should be given so that it can be correctly interpreted by the dispenser and leave no doubt about the intension of the prescriber. There is no global standard

for prescription writing and every country has its own regulation. In general the following details should be shown clearly on the prescription order :Date of prescription ,Patient information (name, age, sex, address and card number), Medication information (name, strength and dosage form) , Dispensing directions for the dispenser, Direction for use, Refill and other information, like special advice or warning, The prescribers name and signature [1, 2].

Now a days a more advanced means of prescribing which is a computerized (electronic) prescribing is in use especially in developed nations. Electronic prescribing has an important advantage over hand written prescribing in that, it enables the transmission of legible prescription, which intern greatly minimizes or even eliminates the interpretation error that can occur with hand written prescription Medication error, which includes inappropriate prescribing like omission of needed prescription information and illegible writing can affect counseling of patients and patients ability to manage self care. It also reduces patient's adherence to therapy and a sense of being involved in one's own care. Medication errors also are associated with a significant number of hospitalizations each year as well as numerous reports of morbidity and mortality [3].

In the study conducted on prescription writing patterns and errors in a family medicine residency programme in St. Margaret Memorial hospital, Pitts burgh, Pennsylvania ; among copies of 1814 prescriptions analyzed during the study ,one – third (1/3) of the prescriptions were written using the generic name. On the average 21% (373) of all prescriptions collected contained at least one prescription writing errors, errors were characterized as omission (6%) unfulfilled legal requirements (1%) incomplete directions (1%) and unclear quantity to be dispensed [4.].

In the study on assessment of prescription errors in UK clinical care units, it was observed that among the total of 21,589 prescriptions collected for study, 15% of the prescriptions had one or more prescription errors and among all errors 47.9% of the errors was due to not writing the order according to the British National formulary recommendation, non standard nomenclature and writing illegibly [5].

In the study on evaluation of prescription writing quality in French university hospital, among the 866 prescriptions collected for the study, 99.5% were dated, patient identification (patient age, Name, sex, Address, and Registration number) was complete in 35.3%. The prescriber was identified properly by both full name and signature in 7.5% of the prescriptions. Medication information was complete in only 24% of the prescription [6].

In a study conducted on pattern of prescription and drug use in ophthalmology in a tertiary hospital in new Delhi, India, among the 1017 out patient prescription audited during the course of the study, the duration of therapy was recorded for only 26.4% of the drug prescribed. The dosage form was not recorded for 4.6% of the drugs prescribed, the frequency of drug administration was recorded for 77.9% of the drugs prescribed, but for the remaining 22.1 % of the drugs, the frequency of administration was not recorded in the prescription .In this study it was reported that the drugs were prescribed both by generic name(35%) and brand name (65%), with brand prescribing clearly dominating generic prescription. The average number of drugs per prescription varied from 1 to 10 [7].

In assessment of psychotropic drug prescriptions in Al-quassim region, Saudiarbia among the 18,265 prescriptions collected for the study, 1996 prescriptions lacked a specific item .The most common items missing were the duration of treatment (n=3425,18.75%), sex of the patient (n=1689,9.225%) and age of the patient (n=1595,8.75%) [8].

In the study on the incidence of prescribing errors in an eye hospital, UK, among the 1952 prescription papers which contained a prescribed drugs of 3402, and which were collected for analysis, it was seen that, 159(8%) of the 1952 prescriptions had at least one error of writing or a drug error, and the 144 of the 1952 prescriptions ordered had incorrect formats or were illegible and in 18 out of the 144 prescription that is in 13% of the prescriptions, the presciber could not be identified [9].

A study on health technology assessment perspective on prescription writing was conducted in 3 hospitals found in Copenhagen, Denmark. In this study it was reported that out of the 709 prescriptions collected for the study, 428 (60.4%) were unambiguous, in 664

(93.7%) prescription, drug were written with their commercial drug name (brand name) and only 65 prescription (9.2%) contained drugs with there generic name, and in 411 (57.9%) of prescriptions, dosage forms of drugs were stated. The strength or concentration of drugs were sated in 44(6.2%) of the prescriptions .The dose, the schedule, the dosing time and the duration was stated for 614 (8.6%), 602(84.9%), 132(18.6%) and 673(94.9%) prescriptions, respectively [10].

In the study on noncompliance with prescription writing requirements and prescribing errors in an out patient department in Malaysia, it was reported that among the 397 prescriptions collected for the study, 130(32.7%) of the prescriptions lacked the age of the patient and 2(0.5%) of them lacked the registration number, 68(17.1%) of the prescription were not dated.

The prescribes name and signature were absent in 7(1.8%) and 1(0.3%) of the prescriptions respectively and 28 (7.1%) of the prescriptions were illegible. and among the 862 drugs prescribed on those prescriptions, drug name, route of administration and dosage were absent in 2 (0.2%), 690 (80%) and 75 (8.7%) of the prescriptions respectively. 46 (5.3%) prescriptions lacked the frequency of administration. The strength, dosage form and duration or the number of doses were omitted in 485(56.3%), 314 (36.4%) and 76 (8.8%) of the prescriptions respectively. 50 (5.8%) of the prescription didn't contain the quantity of drug to be dispensed [11].

In a study on prescription writing in Gonder out patient teaching hospital, Ethiopia, among the total of 19,119 prescriptions collected for analysis from Gonder out patient hospital selling pharmacy, it was observed that in 6995 (36.6%), 3204(16.8%), and 2380(12.4%) of the prescriptions respectively, age, sex, and chart number of patient were not recorded. 2999(12%), 1346(7%), 1217(6.4%), 1116, (5.8%) and 301 (1.6%) of the prescription didn't indicate route of drug administration, direction for drug use, frequency of drug administration, drug dose and duration of treatment, respectively. No prescription order had special advice or warning to the patient, and in 2073(10.8%) of the prescription, date was omitted.

Out of the dispensed drugs, 82. 9%were written in generic names. In 123(0.6%) and 133(0.7%) of the prescriptions, physicians' qualification and signature was omitted, respectively [12].

In the preliminary investigation on the pattern of prescription writing and the attitude of prescribers towards prescription writing in some health institutions located in Wollo region, Ethiopia, it was reported that among the 738 prescription collected for the study, none of them contained any address of the patient. Only 6.5%(48 prescription) recorded the age of the patient and 1.08%(8 prescriptions) contained sex of the patient. Card no. of the patient was recorded in 111(15%) of the analyzed prescriptions. Out of the 1410 drugs prescribed, 567(40.2%) contained the correct strength, 548 (38.87%) had included the dosage form of the drug, 638 (45.2%) had given the frequency of dosage and route of administration.

On a given prescription, a maximum of 6 and a minimum of 1 drug (s) were prescribed giving an average of 1.91 (approximately 2) drugs per prescription. 8.27% of the prescriptions contained active constituents with the same Pharmacologic activity on one prescription and about 728 (51.63%) of the drugs were prescribed with their generic name, but the remaining 682 (48.37%) of the prescribed drugs were written with their brand names, Chemical formulas and unofficial abbreviations. It was also observed that about 31.7% of the prescriptions were illegible [13.]

In the study on the quality of prescription at a tertiary care Pharmacy in Addis Ababa, among a total of 2191 prescriptions that were collected from Tikur anbesa hospital pharmacy, it was observed that only few of the prescriptions had complete information. In about 50% of the prescriptions, sex and age of the patient, and prescriber name were not recorded. About 95% and 70% of the prescriptions lacked address and card number of patients, respectively. On average 15% of the prescriptions were not legible and 13% of the prescriptions were not dated [14].

In a study conducted on the pattern of drug utilization in inpatient department in Jimma hospital, South West Ethiopia, among the total number of prescriptions analyzed, it was reported that 23% of the prescription

lacked information pertaining to the dose, and 54%, 54% and 42%of the prescriptions contained data pertaining the route, frequency and duration of administration, respectively. In this study, it was revealed that the maximum number of drugs prescribed per prescription was 8, and the average number of drugs prescribed per prescription was 2.9 for children and 3.5 for adults [15].

In Ethiopia, reports on the extent of prescription order writing errors are so limited that, there is no even a single research done on the topic in Jimma zone. Because of this, issues related to poor prescription order writing. i.e. improper ,un clear , and incomplete prescription order writing is not yet addressed. Hence, assessment of prescribers adherence to basic standards of prescription order writing is an important tool to evaluate whether drugs are used rationally or not. Therefore, it is believed that this study will help to identify the basic problems and the magnitude of the problems associated with prescription writing in the study area so that valuable suggestions that may initiate interventions by the responsible authorities can be for warded. More over the study will help to provide base line information that may be helpful for further investigation and study on the topic. The objective of this study is to assess prescribers adherence to the basic standards of prescription order writing in Serbo and Asendabo health centers

MATERIALS AND METHODS: The study was conducted in Serbo and Assendabo health centers, Jmma zone, Oromiya region, south west Ethiopia. Retrospective study was done on those prescription written from 2005 to 2007 . Systemic random sampling was used to collect the data (the prescriptions) and the sample size was calculated using appropriate formula given below; that give a total number of 384 prescriptions.

$$n = \frac{z^2 pq}{d^2}$$

where n= sample size, Z= reliability coefficient for the desired confidence interval, (CI); for 95% CI, Z=1.96 p= The proportion of population possessing the characteristic of interest, since there was no previous similar study in the area to know the characteristic of interest, P was taken as 0.5. d= 0.05 (taking 5% as margin of error).

Giving certain allowance, a total of 424 prescriptions (212 prescriptions from each health center) were collected and proportionally allocated between the two health centers. As to the ethical consideration, formal letter was obtained from Jimma university and appropriate ethical approval and confidentiality was obtained. Data was cleared, categorized, compelled and analyzed manually by descriptive statistics using scientific calculator

RESULTS: Data was cleared, categorized, compelled and analyzed manually by descriptive statistics using scientific calculator. Results were presented in the form of tables, figures and percentages

from the dispensaries of Serbo and Assendabo teaching health centers and analyzed to assess the prescribers adherence to the basic standards of prescription order writing. The extents to which the prescribers adhere to these standards are shown in **table 1 and table 2**.

TABLE 1: THE NO. AND PERCENTAGE OF PRESCRIPTION ORDERS CONTAINING PATIENT INFORMATION AND OTHER RELEVANT PARAMETERS IN SERBO AND ASSENDABO HEALTH CENTERS, MARCH 2006.

| Parameters	Name of health institution			
	Serbo H/C		Assendebo H/C	
	No.	%	No.	%
Prescriptions analyzed	**212**	-	**212**	-
Name of patient	212	100%	212	100%
Date	160	75.5%	95	44.8%
Age	205	96.7%	202	95.3%
Sex	202	95.3%	172	81.1%
Address	32	15%	-	-
Card No	62	29.2%	38	17.9%
Prescribers name	-	-	-	-
Prescribers signature	142	67%	13	6.1%
Legibility	195	92%	204	96.2%

TABLE 2: THE NO. AND PERCENTAGE OF DRUGS WITH SOME IMPORTANT DRUG INFORMATION PARAMETERS IN SERBO AND ASSENDABO HEALTH CENTERS, MARCH 2006

Parameters	Name of health institution			
	Serbo H/C		Assendebo H/C	
	No	%	No	%
Total No. of drugs pre scribed	440	-	379	-
Drugs with strength	249	56.6%	254	67%
Drugs with dosage forms	265	60.2%	198	52.2%
Drugs with dose	337	85.7%	340	89.7%
Drugs with frequency of administration	349	79.3%	320	84.4%
Drugs with route of administration	270	61.4%	255	67.3%
Drugs with total Quantity or length of treatment course	419	95.2%	359	94.7%

Except age and total Quantity or length of treatment course of a drug, in the prescription order of both health centers and sex in the prescription order of Serbo health center, which showed a better adherence, all other parameters were omitted from a number of prescription orders of both health centers. The nine most commonly omitted parameters in the prescription orders of serbo health center were, name of prescriber (100%), address of patient (85%), card no (70.8%), strength (43.4%), signature of prescriber (33%), dosage form (39.8%) route of administration (38.6%) and date of prescription (24.5%). The dose of the drug was also omitted in 14.3% of the prescribed drugs.

Out of the total prescriptions analyzed in serbo health center, 283 (64.3%) were prescribed in their Generic name, where as 128 (29.1%) and 29 (6.6%) in their brand name and using abbreviations, respectively. Where as in the prescription orders of Assendabo health center the nine most commonly omitted parameters include; address of the patient and name of the prescriber (both are totally omitted), signature of the prescriber (93.9%), card no. (82.1%), date of prescription (55.2%), dosage form (47.8%), strength (33%), route of administration (32.7%) and sex (18.9%).

Frequency of administration and dose were also omitted in 15.6% and 10.3% prescription orders, respectively. Out of the 379 drugs prescribed in Assendabo health center, 232 (61.2%) of the drugs were prescribed in their generic name while 101 (26.6%), 45 (11.9%) and 1 (0.3%) in their brand name, using abbreviations like TTC, CAF, etc…and using their chemical formula such as $FeSO_4$ etc…respectively (**Figure 1**).
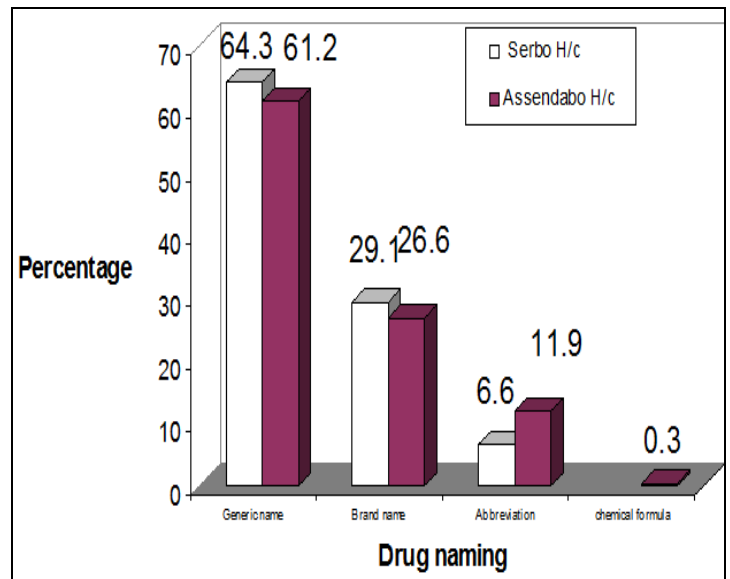
FIGURE 1: PERCENTAGE OF DRUGS WITH DIFFERENT FEATURES OF NAMING WRITTEN IN PRESCRIPTION ORDERS OF SERBO AND ASSENDABO HEALTH CENTERS, MARCH 2006.

Regarding legibility, about 8% and 3.8% of the prescription orders were found to be illegible in Serbo and Assendabo health centers, respectively. On a given prescription, a maximum of 4 and minimum of 1 drug(s) were prescribed in serbo health center, and a maximum of 5 and a minimum of 1 drug(s) in Assendabo health center giving an average of approximately 2 drugs per prescription in both health centers.

DISCUSSION: Prescription writing is an important aspect of medical practice. A properly written prescription is the basis for giving appropriate information, instructions and warnings to the patient and it ensures adherence to therapy and protects the patient from unnecessary harm related to therapy.

The most carefully conceived prescription order may become therapeutically useless, unless it communicates clearly with the dispenser and adequately instructs the patient on how to take the prescribed medication. In general, poor adherence to the basic standards of prescription order writing can lead to incomplete treatment in terms of safety, efficacy and cost of drug therapy [2].

In our study, a number of prescription orders were found missing certain essential components.

As shown in the result, percentage of prescription in which date is omitted are 24. 5% and 55.2% in Serbo and Assendabo health centers, respectively; which is a much higher omission than that observed in study done in Malaysia [11] and Gondar teaching Hospital [12]. Prescriptions should be dated at the time they are written and also when they are received and filled in the dispensary, because the date of the prescription order is important in establishing the medication record of the patient. Unusual lapse of time between the date a prescription was written and the date it is brought to the dispensary should be questioned by the dispenser to determine if the intent of the prescriber and the need of the patient can still be met. The date of a prescription is also important to the dispenser in filling prescriptions for controlled substances.

In this study, only less than 5% of the analyzed prescriptions lack information regarding the Age and sex of the patient in Serbo health center and the age of the patient in Assendebo health center, which shows a better figure (i.e. better adherence), when compared to studies done in France [6], Gondar [12] and Wollo [13]. But the sex of the patient was missed in (18.9 %) of the prescription orders in Assendabo health center, which shows a much lower omission when compared to the report from Wollo [13]. Age is one of the valuable factors that affect response to drugs. This is because in addition to other factors, for example weight, Age of the patient is also an important factor in calculation or determination of doses. Moreover, selection of appropriate dosage forms of drug also depends on age.

In this study, only 15% of the prescriptions had information about Address of the patient in Serbo health center. This is a lesser figure when compared with the study done in France [6], but a higher figure when compared with the result from Addis Ababa [14]. But none of the prescription from Assendabo health center had information about address of the patient, which is similar to the report from Wollo [13]. The address of the patient is important in patient identification, and has also a medico legal implication.

The card no. of the patient was recorded only in 29.2% and 17.9% of the prescriptions in Serbo and Assendabo health centers, respectively. These values are higher than those reported from Wollo [13], but are less than those reports from France [6], Malaysia [11], Gondar [12], and Addis Ababa [14]. The card no. of the patient is important in patient identification and establishing the Medication record of the patient.

The signature of the prescriber was recorded only in 67% of the prescriptions in Serbo health center and 6.1% in Assendabo health center, while the name of the prescriber was totally omitted from the prescriptions of both health centers. In comparison with other studies done in Malaysia [11], and Gondar [12], there is less adherence in recording the prescribers signature in Serbo and Assendabo health centers. Prescriptions should be signed and the name of the prescriber should be indicated. This helps to identify the prescriber that helps to facilitate further professional contact between the prescriber and the dispenser that may be required when ever a certain error or ambiguity on the prescription order arises. The identification of the prescriber by name and signature also has a medico legal importance.

It was also found that 8% of the prescriptions in Serbo health center, and 3.8% of prescriptions in Assendabo health center are illegible. These values show a better adherence when compared to previous results from Wollo health institutions [13] and Tikur Anbesa hospital [14]. But the percentage of illegible prescriptions in Serbo health center is similar with the result obtained from Malaysia [11]. Prescriptions should be written legibly in ink or type written so that any one involved in the dispensing activities should easily read it, since it could be filled by any drug out let out side the health center.

Among the prescriptions analyzed in both centers, strength and dosage forms were recorded in 56.6% and 60.2% of the prescriptions, respectively in Serbo and 67% and 52.2%, respectively in Assendebo health

centers. All these figures are higher when compared to reports from Denmark [10] and Wollo, Ethiopia [13], (except high figures of dosage form recording in Denmark than Assendabo). But the percentage of prescriptions having dosage form in both health centers is lower than reports from Malaysia [11].

Writing the dosage form and strength of a given drug on prescription order is very important. The omission of strength or dosage form can pose a problem in that a number of drugs are available in various strengths and dosage forms,

In the study, the dose and frequency of administration were recorded in 85.7% and 79.3% of the prescriptions in Serbo health center and 89.7% and 84.4% in Assendabo health, center respectively. These values are less when compared to results obtained from Malaysia [11] and Gondar [12]. Omission of dose and frequency of administration of a given drug could lead to indiscriminate and inappropriate use of drugs, which may result in therapeutic failure or drug toxicity.

In our study, the route of administration and total quantity or length of treatment course were recorded in 61.4% and 95.2% in Serbo health center and 67.3% and 94.7% in Assendabo health center, respectively. These figures are higher when compared to reports from Malaysia [11] but are less when compared to reports from Gondar teaching hospital [12]. It was also observed that about 64.3% and 61.2% of the drugs were prescribed in their Generic name in Serbo and Assendabo health centers, respectively. The rest of the drugs were written with brand names, chemical formulas and with unofficial abbreviations . As compared to reports from Gondar teaching hospital [12], Generic prescription of drugs is much less practiced in Serbo and Assendabo health centers. But it is found to be better when compared with reports from New Delhi [7], Denmark [10] and Wollo [13].

When the results of the two health centers are compared by figure, omission of date, sex, card no and prescribers signature was higher in Assendabo health center than Serbo health center, with a much higher omission of prescribers signature in Assendabo (93.9%) than Serbo health center (33%), and also date in Assendabo health center (55.2%) than in Serbo health center (24.5%).

No prescription in Assendabo health center contained address of the patient, while 15% of the analyzed prescription in Serbo health center contained address of the patient. Omission of age of the patient in Serbo health center was 3.3% while in Assendabo health center it was 4.7%, which is almost approximately the same.

8% of the prescriptions in Serbo health center were illegible, but only 3.8% of the prescriptions were illegible in Assendabo health center. This shows a slight better adherence to legibility in Assendabo Health center than Serbo health center.

Out of the total prescribed drugs in the two health centers, omission of strength, dose, frequency of administration and route of administration was slightly higher in Serbo than Assendabo health center, while omission of dosage form is higher in Assendabo than Serbo health center (Table 2).

In Serbo health center, 4.8% of the prescribed drugs lacked information on total Quantity of drugs or length of treatment course, but in Assendabo health center, this figure was 5.3%, which is almost approximately the same. Prescribers in Serbo health center showed a slightly better adherence to Generic prescription relative to those prescribes of Assendabo health center.

In general, omission of patient information (age, sex), including date of prescription and prescribers information (signature) was higher in Assendabo health center than Serbo health center (Table 1). But omission of drug information (strength, dose…) except dosage form and total quantity of drug or length of treatment course was higher in Serbo health center than Assendabo health center (Table 2).

The possible causes for omissions of essential components of the prescription order might be due to too hasty prescribing (hurried to prescribe), tiredness because of workload, failure to appreciate the importance of writing every information on the prescription (unawareness of the importance) or because of negligence or carelessness. Absence of Standard (printed form of) prescription paper may also be another cause for prescirbers omission of essential components of prescription order writing.

In conclusion, this study showed that, in both health centers, essential components of prescription order that could have medical, economical and medico legal importance were omitted. In order to improve adherences of prescribers to the basic standards of prescription order writing, prescribers must first believe in the importance of correct prescription writing and be aware of the problems associated with poor prescription writing and give attention and be persuaded to adhering to it. In order to achieve this, various interventions such as educational, Managerial and regulatory strategies should be designed and implemented by the concerned technical and Administrative bodies.

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