Evaluating rational drug use with the help of World Health Organization's core indicators in Bule Hora Hospital, Southern Ethiopia

Güney Etiyopya Bule Hora Hastanesinde Dünya Sağlık Örgütü'nün temel göstergeleri yardımıyla akılcı ilaç kullanımı değerlendirilmesi

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Abstract

Budgets on drugs accounts for 20% to 50% of total health budget in developing countries. Knowledge gap, loose drug control, loads on health professionals and patient beliefs are some of the factors contributing to this problem. Therefore, the main objective of the present study was to enhance rational drug use by assessing patterns of drug use with the help of World Health Organization's Core indicators in Bule Hora Hospital, Borena Zone, and Southern Ethiopia. WHO designed criteria was used to evaluate rational drug use cross sectionally in Bule Hora Hospital in Southern Ethiopia from February 10 to 20, 2013. Three hundred eighty four prescription papers were systematically selected for retrospective study while prospectively 30 patients were chosen. Pretested questionnaires and WHO designed criteria were used and the results were compared with WHO reference standards and recommendations. The result of the present study showed over prescription of drugs per prescription paper (2.33). Somewhat less time was devoted to consultation (5.50 minutes) and dispensing (1.22 minutes). The majority of patients (73.3%) knew the dosage of prescribed medications. Of eighteen prescribers, thirteen were aware of existence of the essential drug list. Based on the finding of this research, almost all WHO core indicators of rational drug use were not met. Antibiotics were the most widely used drug classes. Therefore, in order to control the problem of rational drug use, the ministry of health should design a strategic plan to monitor adequate implementation of WHO designed criteria for rational drug use.

Keywords: Rational drug use, patients, prescribers, facility, WHO/ INRUD core drug use indicators

Özet

İlaçlara ayrılan bütçeler gelişmekte olan ülkelerde toplam sağlık bütçesinin% 20 ile 50'sini oluşturmaktadır. Bilgi eksikliği, gevşek ilaç kontrolü, sağlık profesyonellerinin üzerindeki yük ve hasta inanışları bu soruna yol açan faktörlerden bazılarıdır. Bu nedenle, bu çalışmanın temel amacı Güney Etiyopya Bule Hora Hastanesin de Dünya Sağlık Örgütü'nün temel göstergeleri yardımıyla ilaç kullanma alışkanlıklarını değerlendirerek akılcı ilaç kullanımını arttırmaktır. Akılcı ilaç kullanımını değerlendirmek için DSÖ kriterleri kesitsel olarak 10-20 Şubat 2013 tarihleri arasında Güney Etiyopya Bule Hora Hastanesinde kullanılmıştır. Prospektif 30 hasta seçilmişken, üç yüz seksen dört reçete kağıdı sistematik retrospektif çalışma için seçildi. DSÖ tarafından tasarlanmış kriterleri ile denenmiş anketler kullanıldı ve sonuçlar DSÖ referans standartları ve önerileri ile karşılaştırıldı. Bu çalışmanın sonucu her bir reçete kağıdı başına (2.33) fazla ilaç yazıldığını gösterdi. Biraz daha az zaman konsültasyon (5.50 dakika) ve (1.22 dakika) dağıtıma ayrıldı. Hastaların çoğunluğu (% 73.3) reçetelenen ilaçların dozunu biliyordu. Reçete yazan on sekiz kişiden on üçü temel ilaç listesinin varlığından haberdardı. Bu araştırmadan çıkan bulgu akılcı ilaç kullanımı için hemen hemen tüm DSÖ temel göstergelerinin karşılanmadığıdır. Antibiyotikler en yaygın kullanılan ilaç sınıfıydı. Bu nedenle, akılcı ilaç kullanımı sorununu kontrol etmek amacıyla, sağlık bakanlığı akılcı ilaç kullanımı için DSÖ tarafından tasarlanmış kriterlerin yeterli uygulanmasını izlemek üzere bir stratejik plan tasarımı yapmalıdır.

Anahtar kelimeler: Akılcı ilaç kullanımı, hasta, reçete yazan, imkan, DSÖ çekirdek ilaç kullanımı göstergeleri

Introduction

Drugs are an important weapon in the fight against diseases and major components of pharmaceutical care. Hence, current expenditure on drugs rise up to 20% to 50% of total investment on health in developing countries. Because, drugs are relatively the cheapest interventions identified.

However, World Health Organization (WHO) reports

the prevalence of inappropriate use in many of developing countries before Knowledge gap, loose drug control, load on health professionals and patient beliefs are some of the factors contributing to this problem (1).

The concept of Rational drug use was defined by the WHO as "patients receive medicines appropriate to their clinical needs, in doses that meet their own individual requirements for an adequate period of

time, at the lowest cost to them and their community" (2, 3). But the rational use of drug is complex process involving a number of factors such as economy, funds, manpower, culture, attitude and beliefs. Therefore, to ensure consistent, valid and reliable identification of drug use problems, the WHO developed and tested a set of standardized indicators of general out patients' care (1- 4).

The tools used to standardize rational drug use by WHO/INRUD (International Network of Rational Use of Drugs) have three major groups of indicators: Prescribing indicators, patient care indicators, and facility indicators. Prescribing indicators include average number of drugs per encounter, percentage of drugs prescribed by generic name, percentage of encounters with an antibiotic prescribed, percentage of encounters with an injection prescribed, percentage of drugs prescribed from the essential drug list or formulary. Patient care indicators are average consultation time, average dispensing time, Percentage of drugs actually dispensed, percentage of drugs adequately labelled, patient's knowledge of correct dosage. Other indicators are: Health facility indicators: availability of copy of essential drug lists or formulary and the availability of key drugs in the facility (5).

According to a WHO survey (6), nearly 50% of patients don't take drugs appropriately, although many medicines are manufactured worldwide. This result in resource wastage, adverse drug reactions, enhanced microbial resistance, mortality and morbidity. Knowledge gap, loose policy on drugs, load on health professionals and inappropriate promotion of medicines are some of the factors contributing to this problem (7). Even though irrational drug uses are common in both developed and developing countries, the degree of the problem is higher in developing countries like Ethiopia where practices such as poly pharmacy, the use of wrong or ineffective drugs, under use or incorrect use of effective drugs and overuse of antimicrobials and injections are very common (8-10).

Generally, health system, prescriber, dispenser, patient and the community may play a great role in the fight against irrational drug use. Thus, it is very important to understand every one's responsibility to use drugs in an appropriate and rational way. Therefore, the main objective of the present study was to evaluate rational drug use with the help of World Health Organization's core indicators in Bule Hora hospital, Borena Zone, Southern Ethiopia.

Materials and Methods
Study Area Description
The study was conducted in Bule Hora Hospital, located in Bule Hora town, Borena Zone, Oromia region, 475 km to the south of capital city, Addis Ababa. Around 200,000 persons were estimated to be served by the Hospital. There are teams of

medical, surgical and orthopaedic, pediatrics, gynecology and obstetrics and ophthalmology distributed in six wards with an annual outpatient attendance above 13,000 cases. The hospital also has outpatient pharmacy, inpatient pharmacy, antiretroviral pharmacy and drug information centre.

Design of the study
Retrospective and prospective cross sectional study were used on the study site from February 18 to 24, 2013. Prescribing indicators, patient care indicators and health facility indicators were calculated using WHO/INRUD guidelines and methods used by Angamo et al (2011) [7, 8, 11- 13].

I. Prescribing Indicators: The medical records of the previous twelve month period (January 1 to December 30, 2012) were collected from the outpatient pharmacy department, and 12, 388 prescription papers were obtained. A total of 384 prescription papers were selected for retrospective assessment by systematic sampling from 12,388 last year collected prescriptions. The sample size of prescription paper was determined by using simple population proportion formula as there was no similar study conducted in the study area which was published. A lottery system was used to identify the first prescription paper, and the others were chosen at an interval of 32 until the required number of prescription papers was obtained. Then, based on WHO/INRUD guideline: average number of drugs per encounter, percentage of drugs prescribed in generics, percentage of prescriptions with antibiotics, percentage of prescriptions with injections and percentage prescribed drugs from Essential Drug List (EDL) were calculated from the encounters [7, 8, 11].

II. Patient care indicators: Prospectively, within five days, thirty (30) patients were selected with an average of six per day. The patients were selected by simple random sampling throughout the data collection period until the required sample size was attained. Data was collected by using pretested questionnaires. Information on consultation time, dispensing time, and drugs actually dispensed were collected on 30 patient encounters and they were interviewed for knowledge of correct dosage schedule and the drug labelling quality was observed alongside. The values were measured using WHO equations and equations in some studies [7, 12, 13].

III. Health facility indicators: the availability of a copy of an essential drugs list or formulary and key drugs were used as health facility indicators. Availability of Essential Drugs List or formulary was checked in the consultation room or dispensing area or drug store. WHO indicators list with their formulas [7, 8, 11- 13]: The knowledge, attitude and practice (KAP) of prescribers were assessed through self-administered open-ended questionnaire. All prescribers during the study period were included and we got twenty prescribers in the OPD of these health facilities

during the study period. Possession of EDL, use of the EDL as basis for prescription, expressed need for education on RDU, awareness of existence of NDF &EDL and prescribers' perceived definition of rational drug use were used in form of questionnaire to assess the prescribers KAP (1).

Finally the collected data were analysed using Microsoft excels software and SPSS 16. The prescribing, patient care and facility indicators were calculated using WHO equations above.

Study Variables
The variables of this study were: age, sex, occupation, prescribers qualification, educational status of the patient, prescribing indicators, patient care indicators, health facility indicators and Prescribers KAP towards rational drug use.

Ethical Consideration
The study was approved by Ethical Committee of the Department of Pharmacy, College of Public Health and Medical Sciences, Jimma University. Prior to data collection participants were informed about the research and asked to give their consent.

Results
Socio demographic characteristics
Thirty patients were participated in the study of which the majority were in the age range of 19-35 (43.4%) and males were 19 (63.4%). With respect to educational status, 46.6% of all patients completed primary school (Table 1).

Table 1. Socio demographic characteristics of patients in Bule Hora hospital outpatient pharmacies, Southern Ethiopia, Feb. 2013

Socio-economic characteristics	Number	%
Age		
12-18	5	16.6%
19-35	13	43.4%
36-65	10	33.3%
>65	2	6.7%
Sex		
Male	19	63.4%
Female	11	36.6%
Educational status of patients		
Illiterate	8	26.7%
Primary School	14	46.6%
Secondary school	5	16.7%
College and above	3	10%

Prescribing Indicators
For prescription pattern study a total of 384 prescription papers were reviewed and analysed. As shown in figure 1 the majority of the prescription paper contain two drugs (37%) followed by three (30.7%).
Using the criteria of WHO on drug use, we found an average of 2.3 drugs per prescription. Generic name was used in 96.8% of the prescription while 70.6% and 20.3% of the prescriptions were encountered

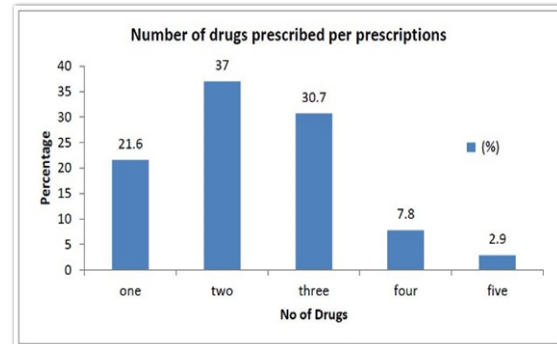with an antibiotic and injections, respectively (Table 2).

Figure 1. Number of drugs prescribed per prescription in Bule Hora hospital in southern Ethiopia, Feb. 2013.

Table 2. Prescribing indicators in Bule Hora Hospital, Southern Ethiopia, Feb. 2013.

Indicators	Outcome	WHO REF. STD
Average number of drugs per encounter (n=894)	2.3	1.6-1.8
Percentage of encounter with an antibiotic prescribed	271/384 (70.6%)	20-25.4%
Percentage of encounter with an injection prescribed	78/384 (20.3%)	13.4-24.1%
Percentage of drugs prescribed by generic name	865/894 (96.8%)	100%
Percentage of drugs prescribed from EDL	793/894 (88.7%)	100%

Patient care indictors
As shown in Table 3 patient care indicators were evaluated based on WHO guideline. The average consultation time was 5.5 minutes and 2.3 drugs were prescribed.

Table 3. Patient care indicators in Bule hora hospital, Southern Ethiopia, Feb. 2013.

Indicators	Outcome	Percentage (%)
Average consultation times (minutes)	5.5(mint)	
Average dispensing time (minutes)	1.22(mint)	
Average number of drugs prescribed	2.33	
Percentage of drugs actually dispensed	70/78	89.7%
Percentage of drugs adequately Labeled	18/70	25.71%

As shown in Table 4 the percentage of patients who knew the names, duration and frequency, dosage and side effects of the dispensed medications were 16.6%, 63.3%, 73.3% and 6.6%, respectively.

Table 4. Patients' knowledge of dispensed drugs in Bule hora hospital, Southern Ethiopia, Feb. 2013 (n= 30 patients).

Parameter	Results (%)
Knowledge of names of dispensed medications	5(16.6%)
Knowledge of correct dosage of dispensed medications	22(73.3%
Knowledge of duration and frequency of dispensed medications	19(63.3%)
Knowledge of side effects of dispensed medications	2(6.66%)
Knowledge of drug –drug interaction of dispensed medications	0
Knowledge of drug –food interaction of dispensed medications	7(23.3%)

Health facility indictors
The health facility has drug formularies and essential drug list in single OPD but no copy of standard treatment guideline. During the study period, except quinine sulfate injection, all key drugs were available (Table 5).

Table 5. Key drugs available in Bule hora hospital, Southern Ethiopia, Feb. 2013.

Key drugs in the stock
Oral rehydration salts
Cotrimoxazole tablets
Procaine penicillin injection
Amoxicillin(capsule, suspension)
Ampicillin (capsule, suspension)
Chloroquine tablet
Arthemether-lumefantrine
Ferrous salt+ Folic acid tablet
Mebendazole tablet
Tetracycline ointment
Iodine/gentian violet
Benzoic acid +salicylic acid ointment
Acetyl salicylic acid/ paracetamol tablet
Vitamin A (retinol)

Out of 20 prescribers who received the KAP questionnaire, 18 returned them with a 87.1 % response rate. Of 18 respondents, 13 (72.2%) were aware of the existence of the EDL, while 5 (27.8%) prescribers were not aware existence of EDL. Eight (44.5%) of the prescribers prescribed a mixture of branded and generic drugs mostly. Only 2 (12.1%) of

the study participants defined RDU correctly (Table 6).

Table 6. Knowledge, attitude and practice characteristics of prescribers in Bule hora hospital, Southern Ethiopia, Feb. 2013.

Characteristics	No (%)
Prescribers profession	
Doctors	8 (44.4%)
Nurse	10 (55.6%)
Duration of professional practice	
Less or equal to 1year	3
1-5 year	10
Above 5 year	5
Prescriber s awareness about NDF &EDL	
Yes	13(72.2)
No awareness	5(27.8)
Possession of EDL	
Possess	7(38.9)
Do not possess	11(61.1)
Use of EDL for prescription	
Yes	5(27.8)
No	13(72.2)
Prescriber prefer to prescribe	
Generic	8(44.5)
Branded	2(11)
Mixture of brand and generic	8(44.5)
Definition of the term rational drug use	2(11.10%)
Did you receive any training about RDU	3(16.77%)

Discussion
Rationality and cost effectiveness of pharmaceutical care requires continuous monitoring of activities and performance of health care providers as well as the facility. In order to maintain uniform health delivery across the world, WHO (1) set certain core criteria that allows healthcare policy planners, managers and researchers to compare among health facilities and evaluate the practices of health professionals toward rational drug use

In the present study it was revealed that more drugs were prescribed in one prescription paper (2.3, Table 3) which was more than WHO set standard. A similar study done in South West Ethiopia health centres showed almost comparable results (2.25 per prescription in the Serbo Health centre and 2.24 in Jimma Health Center) [11]. However, the result of the present study is somewhat higher than similar studies done in other parts of the country such as Gonder (0.98), and Bahir Dar Hospital (1.8) (14) and lower than a study in Ghana Police Hospital (3.7) [15] and Osun State (Southwest) Nigeria (6.11) (16). The value obtained regarding over prescription may be related to prescribers' lack of training as there are enough key drugs except quinine. The observed

polypharmacy may seriously affect health care by increasing side effects, drug interactions, noncompliance and confusion.

Regarding prescription by generic name, 96.8% of prescriptions were prescribed by generic name (Table 3) almost near to the one recommended by WHO (100%) (17). It is a good practice in the study area as compared to studies done in North Western Ethiopia (Gonder Hospital, 72.6%; Bahirdar Hospital, 70.5%; and Debretabor Hospital, 84.1%) [14] and Yenagoa of Nigeria (62%) (18). The reason may be due to prescribers preference of essential drugs which are usually written in generic names as compared to other study sites. This will significantly lower money wastage which will be incurred by purchasing brand drugs.

More antibiotics (70.6%) were prescribed in the study area than those studies done in South West Ethiopia (11) and far from the interval set by WHO (20%-30%) (15,18). Nowadays microorganisms are causing serious infection by being resistant to drugs (resistance to antimalarial drugs, resistance to anti TB drugs etc) (18). The over prescription may arise from absence of strict rules and regulations in our country regarding antibiotics prescription. Therefore, it may affect patient adherence by leading to emergence of drug resistant microorganisms.

Different drugs are administered through a variety of routes with all their pros and cons. Seventy eight (20.3%) of the prescription at the study site were with injection. Though, the value is within the acceptable range set by WHO (13.4%-24.1%) (17, 18), it is closer to the upper limit of WHO standard. This may be due to more supply of drugs in injectable form and patient belief that their illness will be cured when given an injection. Sepsis, local irritation, difficulty of correcting the error, pain, tissue necrosis and hepatitis can accompany if injectable over used.

WHO recommend the use of EDL for effective health delivery (18). Despite no copy of EDL in either the prescribing rooms or at the dispensary, 89% of the prescribed drugs were from the EDL. It is slightly higher than study done in Nigeria military hospital (80%) [1]. Even though it is less than WHO set point (100%) (18), prescribers were well aware of drugs in the essential drug list. The practice of prescribing from EDL should be encouraged through capacity building so as to increase rational drug prescribing patterns.

Another factor affecting the quality of health care is patient care practices. The average times taken for consultation and dispensing medicines were 5.2 and 1.2 minutes, respectively. This was closer to the studies done in South West Ethiopia (6.14 minute and 1.28 minutes, respectively) (11). Nevertheless, the time allotted for consultation was less than that of a study in Nigeria (11.5 minutes) (18). The major

reason for this could be patient load. The communication of patients with health care providers helps them to get enough information about their medications and enhance adherence.

A lower labelling of dispensed drugs (12.3%) was found. Writing the patient's name and generic name of the drug on the label is necessary. This would also help in reducing the risk of dispensing errors. Knowledge about side effects of drugs is also low (6.6%). The good thing is more patients (23.3%) knew drug food interaction. Dosage regimen and the names of the dispensed drugs were clearly mentioned by 73.3% and 16.6% of patients who were interviewed, respectively. The value with respect to dosage regimen was comparable to results obtained from studies done in southwest Ethiopia 72.80% and 66% in Nigeria hospital (11,18). Almost one third (36.7%) of patients didn't know the duration of the medications. This entails that a patient may not complete his therapy, especially in a case where a refill is necessary. Knowledge of the patient is a very central factor in the therapeutic process. There should be improvement as patients' active participation in the health care process will enrich their knowledge if drug compliance and desired therapeutic goals are to be achieved (18).

According to the present study knowledge, attitude and practice study only 11.1% of respondents accurately described the 5 steps in rational prescribing which was similar to study done in Nigerian Army hospital (12%) [1]. This makes the expressed need for education on rational drug use. The KAP finding at this study site was not satisfactory as shown in Table 6.

Although WHO bench mark to rational drug use is not met, the study area is relatively good with respect to generic and injection prescription. However, on average, more drugs were prescribed per prescription and most of the prescriptions contain more antibiotics than WHO recommendations. Beside these, fewer drugs were prescribed from the essential drug list and inadequate knowledge was found among patients' regarding medication management and labelling of dispensed drugs. The knowledge and attitudes of prescribers toward rational drug use was not satisfactory. Therefore, the authors recommend continuing medical education and establishment of drug and therapeutics committee to enhance rational drug use as a means to improve patients' knowledge on dispensed drugs. Beside this, the present finding can be an input for further study aimed on how to improve rational drug use at the study site.

Competing interests
The author and his co-authors do not have any competing interests.

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