

Original article

A baseline survey on prescribing indicators and the underlying factors influencing prescribing in Southern Ethiopia

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Abstract: A cross-sectional descriptive study was conducted to determine the prescribing indicators and the underlying factors influencing prescribing in eight hospitals, in Southern Ethiopia. The results of the quantitative survey revealed that 90.6% of the indicators do not fall within the accepted optimum range. The findings indicated the use of polypharmacy, over-use of antibiotics and injections; with regional average of 2.2 drugs per encounter, percentages of antibiotics 50% (range 4%-64%) and percentage of injections 15% (range 4%-43%). The qualitative survey conducted simultaneously identified acquired habits (75.9%), peer norms and relations (66.7%), lack of drug information (66.7%) and patient demand (64.8%) are among the major underlying factors for the irrational prescribing of drugs. The study has revealed that there is irrational prescribing of drugs for which the underlying factors were determinant to have an influence in the prescribing behaviour. An intervention strategy that is educational, managerial and regulatory in nature is highly recommended to reduce the degree of irrationality to off-set from drug misuse in the region so as to comply with the accepted norms. [*Ethiop. J. Health Dev.* 1998;12(2):87-93]

Introduction

The use of drugs in therapy is based on a rational - scientific model but in practice drugs are distributed, prescribed and used in highly irrational ways. Vignettes are used to illustrate how cultural norms and the profit motive interact to drastically lessen the benefits the developing countries receive from modern drugs(1). What makes a drug a problem is not so much its inherent pharmacological risks, but the way it is prescribed and used. In some cases the consequences can stretch beyond a single patient or group of patients, to encompass the globe. A prime example is the misuse of antibiotics, with the result that many bacteria are now developing resistance to cheaper, safer and effective drugs which results from the widespread and indiscriminate use of antimicrobial drugs (2).

Drugs are playing an increasingly central role in health care, especially in primary health care. It would only be giving a lip-service to preventive health care and to the restoration of health by means of providing good nutrition, improved hygiene...etc unless drug issues are addressed as drugs are "where it is at". The demand for drugs is without limit; yet the effectiveness of these drugs is very low (3,4). Adverse effects of drugs represented one of the five most important quality of care problems for the elderly. In most cases inappropriate prescribing has the major impact. Sometimes drugs prescribed are known to be toxic to specific populations. There are underuse of effective drugs, especially antibiotics(5). The wrong choice of agents are not unusual, for example, opiates and their derivatives are widely used "antidiarrhoeal drugs" which act primarily through their antimotility properties. Yet none of them is recommended for routine

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use in infants and children because their benefits are low as compared to the side effects they cause(6).

In 1985, WHO convened an international conference in Nairobi, Kenya, on the rational use of drugs. Since that time on, there has been an increasing efforts being undertaken to improve drug use practices through promotion of appropriate prescribing behaviours in developing countries. An essential tool for such work was the setting up of an objective and standard methods to describe drug use patterns and prescribing behaviour in health facilities. A standard set of drug use indicators that help to assess the problems, clinically and/or economically to identify the inappropriate drug use, was studied and field- tested by the members of the International Network for the Rational Use of Drugs (INRUD), in close collaboration with WHO Action Programme on Essential Drugs (7-11).

In the past few years drug use indicator studies were undertaken to identify the problems of inappropriate prescribing on which base remedial intervention strategies instituted in a number of countries have produced the desired impacts through increased awareness of rational prescribing. For example, in Uganda, a study on the effect of training intervention of health workers showed a decline in the use of injections from 50% to 41% and reduction in anti-diarrhoeal drug use from 60% to 39%. In rural health facilities in the Nile Province of the Sudan, the percentage of drugs prescribed by generic name increased from 17% to 70% between 1988 and 1991. In Zimbabwe, drug-use surveys are carried out every two years (11-15).

In Ethiopia, in spite of the number of drug promotion activities which have been undertaken by the National Essential Drugs Programme, there are lingering suspicions of irrational drug use in general and inappropriate prescribing behaviour in particular. It is now felt that the overall drug use situation needs to be assessed, problems identified, and remedial intervention strategies be implemented so as to check dangerous trends in drug utilization. The objective of this study is to determine prescribing indicators and the underlying social, psychological, and economic factors that influence prescribing practices in Southern Nations, Nationalities and Peoples Region.

Methods

The study was conducted in eight hospitals owned by government and/or NGOs in the Southern Nations, Nationalities and Peoples Region, namely Soddo, Chenchu and Arba-minch hospitals in North Omo Zone, Yirgalem hospital in Sidama Zone, Dilla hospital in Gedeo Zone, Hossana hospital in Hadiya zone, Attat hospital in Gurage Zone and Aman hospital in Bench-maji Zone. They all provide hospital-based services to an estimated 11 million regional population. Besides these, other health services delivery structures in the Region include 33 health centers and 396 health stations, mainly responsible for providing preventive and promotive health services that are embodied in the Primary Health Care strategy. There are also 385 drug retailers mainly providing drug supply to the people, based on the prescriptions issued in the hospitals and health centers. There is no basic difference among the hospitals, which would likely affect the study outputs. They are all rural hospitals in standard; with similar diagnostic facilities, essential drugs supply, work load, professional skills, prescribing practices, ...etc.

All the eight hospitals were included in the study for wider coverage and regional representation. Eight pharmacists and two physicians were trained to collect the data. WHO's model of training programme for drug use was adopted and a one day orientation on the execution of the survey was given and formats for data collection, prescription indicators, National Essential Drug Lists and written hand-outs were among materials provided for data collection. The formats were pre-tested using retrospective prescription records. For quantitative appraisal the actual data was collected prospectively using randomly selected seven days hospital prescriptions. A total of one hundred prescriptions were randomly sorted out from each hospital to have a sufficient number of sample size. The overall 800 prescriptions collected through the procedure mentioned above were directly recorded on the prescribing indicator format which was constructed to include number of drugs per encounter, number of drugs prescribed by generic name, number of antibiotics prescribed and number of injections prescribed. These encounters were defined in the following manner to avoid ambiguity during data collection.

1. Antibiotics:- Pencillin and other anti-microbials, anti-infective dermatological and ophthalmological agents, anti- diarrhoeals containing streptomycin and neomycin, sulfa drugs, antibiotic eye ointments and skin creams.
2. Generic:- non-proprietary titles which are given to drugs which usually reflect the names of active ingredients. Aspirin (a brand name) is used as generic in this context according to the recommendation of WHO.
3. Percentage of encounters with anti-biotic/injection prescribed:- the number of patient encounters during which antibiotics or injections prescribed divided by the total number of encounters surveyed which measures the overall level of use of the two important forms of drug therapy.
4. Average number of drugs per encounter :-average, calculated by dividing the total number of different drug products prescribed, by the number of encounters surveyed, which measures the degree of polypharmacy. It is not relevant whether the patient actually received the drug (16).

Data collection was conducted in a fixed time frame in all the eight hospitals to avoid “contamination” which would have biased the results, had the survey been organized at different intervals of time to be executed in adjacent hospitals with prior leakage of the news.

A questionnaire consisting of 20 items was administered simultaneously to collect information regarding qualitative measures. This was designed to identify the factors underlying irrational prescribing behaviours that cover the professional qualification, age, sex, years of work experience, the observations and medical beliefs of the respondents in the quality of prescribers drug use pattern and possible underlying motivations. The eight pharmacists who were assigned to collect the prescription data were also given orientation on methods of sampling the prescriber respondents, issuing and collecting the filled questionnaires. Eight copies of these questionnaires were issued to each hospital. Of the total of 64 questionnaires issued based on this, 54(84.4%) were returned completed and were analyzed. There was informed consent from all respondents as it related to the irrational prescribing practices and the motivating factors influencing those practices. Inclusion of the respondents into the study was based on their awareness of the prevalence of irrational prescribing in their respective hospitals. The respondents consisted of general practitioners (83%) and specialists (17%), having age range of 24 -29 years (69%) and 30 years and above (31%) and sex proportion of 85 % male and 15 % female. Respondents also varied in years of work experience, with 1 - 5 years (74 %), and six years and above (26 %).

Data collected were recorded and all questionnaires from each hospital were filled and analysis was done in the Regional Health Bureau using summary tables prepared for this purpose.

Results

The data collected from the prescription patterns in the eight hospitals (Table 1) to indicate quantitative measures have shown both similarities and differences in prescribing practices. Of special interest are outlying values; for example, the use of high average number of drugs per encounter in Hossana, Attat and Soddo hospitals (2.7, 2.6 and 2.4, respectively), the high percentage of prescribing antibiotics in Mizan, Hossana and Dilla hospitals (64%, 60 % and 57 %), and the high percentage of administering injections in Hossana, Dilla, Soddo and Yirgalem hospitals (43%, 22%, 21%, 21%, respectively).

The qualitative data collected through the questionnaires from the 54 respondents (Table Table

1: **Results of prescribing indicators study, SNNPR., 1995.**

S.No. Facility	Ave.drugs prescribed	Percent Generic	Percent Antibiotics	Percent Injections
1. Yirgalem hospital	1.7	70	45	21
2. Mizan hospital	2	78	64	9
3. Attat hospital	2.6	62	54	9

4. Dilla hospital	2	78	57	22
5. Arba minch hospital	2	91	42	4
6. Soddo hospital	2.4	82	41	21
7. Chenchha hospital	2	83	44	8
8. Hossana hospital	2.7	77	60	43
Average/median	2.2	78	50	15
Maximum	2.7	91	64	43
Minimum	1.7	62	41	4

2) revealed that the majority of the respondents have agreed that acquired habits (75.9%), peer norms and relations (66.7%), drug availability (66.7%), patient demand (64.8%), and lack of objective drug information (66.7%) are the major underlying factors for the irrational prescribing. Most of the respondents also believed that lack of prescribers knowledge (61.1%), work load (53.7%), and limited work experience of prescribers (53.7%) are among the factors underlying irrational prescribing.

For the questionnaire items used to investigate adverse influence contributed by health managers or authorities (e.g. to prescribe unnecessarily expensive drugs to relatives or staff members), whether marketing advertisers and industry agents affect the prescribers behaviour, only a few of the respondents (11.1% and 24.1%, respectively) agreed that these are among the factors influencing prescribing behaviour in the health facilities.

Discussion

Numerous studies, both from developed and developing countries, describe a pattern consisting of polypharmacy, use of drugs that are not related to the diagnosis or unnecessarily expensive; irrational use of antibiotics (16). Governments can enhance positively the utilization of drugs and efficiency, through enforcement of laws to adopt rational acquisition, production and encouragement of better use (20). Significant efficiencies and optimal care with reduced costs can be achieved by improving drug prescribing. The drug use indicators studies are best understood as firstline measures, intended to stimulate further assessment to guide subsequent remedial actions.

Although there may not exist objective norms to follow either prescribing indicators or may vary according to local health environment, there is an overall understanding among researchers. It is the opinion of the International Network for the Rational Use of Drugs research team members that the prescribing indicator values for the number of drugs should fall within a range of 1.4 - 1.8, prescribing by Generics, 90%-100%, Antibiotics range from 20-25 %,and percent of Injections < 5%(10,16). In View of this, the results obtained in this simple appraisal are sufficient to arrive at a conclusion.

In settings where pharmaceutical resources are scarce, it is a common practice to impose limits on the number of especially non-antibiotic drugs (19). Despite this norm, the regional average number of 2.2 drugs per encounter was found to be very high and, therefore, indicated misuse of available resources by loading the patients with unnecessary drugs or sending prescriptions to private retailers and thereby expose patients to expensive private sector spending.

Table 2: Results of the qualitative study, SNNPR 1995.

S.No possible underlying factors	yes, N (%)	No, N (%)	Indifferent,N (%)	Total,N(%)
1. characteristics of providers/prescribers				

a) Lack of knowledge	33 (61.1)	18 (33.3)	3 (5.6)	54 (100)
b) Acquired habits	41 (75.9)	7 (13)	6 (11.1)	54(100)
2. Social structure of prescribers				
a) Authority and power pressure	6(11.1)	40(74.1)	8(14.8)	54(100)
b) Peer norms and relations	36 (66.7)	16 (29.6)	2(3.7)	54 (100)
3. Prescriber patient interaction				
a)Cultural attitudes and beliefs	28 (51.9)	22 (40.7)	4(7.4)	54 (100)
b) Patient demand	35(64.8)	12 (22.2)	7(13)	54(100)
4. Work environment				
a) Drug availability	36 (66.7)	15 (27.8)	3 (5.5)	54(100)
b) Work load	29 (53.7)	21 (38.9)	4 (7.4)	54(100)
5. Marketing and influence of industries	13(24.1)	38 (70.4)	3(5.5)	54(100)
6. Lack of objective drug information	36 (66.7)	17(31.5)	1(1.8)	54(100)
7. Limited experience of prescribers	29(53.7)	23(42.6)	2 (3.7)	54 (100)

NB: No of respondents =54
Qualifications of respondents MD & above

The use of generic prescribing varied from 37% to 94% in the studies conducted in a number of developing countries during the period of 1990 - 1993, but improved with the implementation of remedial intervention strategies. This tends to depend on government regulations and enforcement efforts in those countries (19). The median of 78 % found in the present study is very low as compared to the expected norm. Therefore, the need for prescriptions strictly adopted to generic guideline should be checked .An immediate remedy in this line would be required to rectify the prevalent drug prescription malpractices in the Region.

Antibiotics are commonly used in developing countries due to the high prevalence of infectious agents causing disease in humans. However, most countries tend to lie in the use range of 25%40% (18). The present study indicated the median use of 50%(with a range of 41% - 64%) which is very high as compared to the standard, and would require an intervention strategy to address the problem. This seems to be very urgent, as it is one of the predisposing factors for the prevalence of antibiotic resistance which can be disastrous to the community in case of epidemics, especially of bacterial origins.

The use of injections varies considerably, and seems to be declining in most countries. The use of injections is also affected by the availability of injectable drugs and syringes and needles. In spite of the acute shortage of these items in the Region, the median of 15% (range 4%-43%) is clearly too high, particularly in the HIV/AIDS era. The repeated use of syringes and needles carries the risk of abscess formation and transmission of fatal infections. The prevalence of the high rates of injections in the hospitals, despite the availability of better skilled human resources, also indicates the possibility of the worst situation in health centers, health stations and private settings staffed by less skilled health personnels and where also patient demand is more pressing.

The results of the qualitative study are also of important consideration. Acquired habits may not reflect what providers actually know, but the pattern of behaviour they have come to adopt. The majority (75.9%) of the respondents believed that these are the major underlying factors influencing irrational prescribing. It is one of the most serious factors which creates a difficult situation for practitioners to keep abreast with new developments in the use of pharmaceuticals. This rotting norm, if not checked with an intervention strategy, would seriously damage patients. Peer practice norms and relations, account for 66.7% of the respondents as one of the major factors contributing to drug misuse. It is also a powerful determinant, since most of the providers like to feel that their

practices reflect the accepted norms of their peers. More over, lack of drug information objectively, accounted for majority of the respondents (66.7%) which is also a cornerstone for the drawback of rational prescribing. This can be provided by neutral scientists or professional organizations, but also needs managerial and regulatory measures to avoid potentially biased information provided by some drug companies. An equal number of respondents (66.7%) said that drug availability is also one factor involved in contributing to drug misuse. This would influence prescribing behaviour either due to irregular supply of drugs or over-stocked products although the prevalence of overprescribing where drug shortage is acute may seem to be controversial.

Patients demand is probably a very important factor, especially in the rural communities, and should be addressed in prescribing improvement interventions(5). Patient demand believed to be the case in this account in the Region influenced prescription according to 64.8 % of the respondents. One of the basic intervention strategies to rectify the prescribing behavior is the inclusion of medical education in clinical pharmacology based on the practical needs of future prescribers. It should include the principles of rational therapeutics and problem solving approaches to 'immunize' the students and prevent them from possible disturbing factors they would encounter in their future professional career. Moreover regulatory bodies at all levels should set legal support to popularize drug policies so as to make prescribers adhere to rational drug use.

In conclusion, the findings have confirmed that there is irrational prescribing of drugs in the health establishments in the Region with the identification of the underlying factors influencing the practices. These practices need to be addressed to bring back to the right track in line with the accepted norm. To this end, it is recommended that implementation of WHO's model intervention strategies which is educational, managerial and regulatory should be adopted with replication of such simple and rapid appraisal in other parts of the country in order to influence the situation at national level. Such kind of study can be carried out by means of observations in the field, review of medical records and also administration of simple structured questionnaires in case of acquiring qualitative data. It can be conducted rapidly and cost-efficiently without the need for complicated statistical analysis.

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References

1. Fabric SJ and Hischhorn N. Deranged distribution, perverse prescription, unprotected use:the irrationality of pharmaceuticals in the developing world. *Health Policy and Planning*. 1987;2(3):204-213.
2. Chetley A. Problem drugs. Health Action International, Amsterdam,1993.
3. Korn J. What do drugs do to the world? *Dan. Med. Bull* .1984;31(suppl 1):2-3.
4. Yudkin JS. Use and misuse of drugs in the third World. *Dan Med. Bull*. 1984;31(suppl 1):11-17.
5. Stephon B. Soumerai. Factors influencing prescribing. *Aug J hosp Pharm*. 1988; 18.3.

6. Dupton HL, Hornick RB. Adverse effect of Lomotil Therapy . A Joint WHO /UNICEF statement 2nd ed. Geneva, WHO, 1985.
7. The rational use of drugs. Report of the conference of experts, Nairobi, Kenya, November 25-29, 1985 Geneva, WHO, 1987.
8. Ross DD. et al . A strategy for promoting improved pharmaceutical use : The International Network for Rational Use of Drugs. Soc Sci Med. 1992;35:1329 -41.
9. Laing RO. Rational Drug Use: An unsolved problem. Trop. Doct. 1990;20;101-03.
10. Hogereil HV. et al. Field tests for rational drug use in twelve developing countries, The lancet, 1993;342:1408-10.
11. Bimo. Field testing of drug indicators: report of a field trip to Indoneia, Bangladesh and Nepal, June - July, 1991. Boston. INRVD, 1991.
12. Christensen RF. A strategy for the improvement of prescribing and drug use in rural facilities in Uganda, Entebe: Ministry of Health. Uganda Essential Drugs Management Programme, 1990.
13. Bannenberg WJ, Forshaw CJ, Fresle DF, Sallami AD, Wuhab HA. Evaluation of the Nile Province Essential Drugs Project. Geneva: WHO, 1991. WHO/DAP/ 19.10.
14. A baseline survey on drugs use at primary health care level in Bangladesh, Dahaka, Bangladesh: UNICEF, 1993.
15. Zimbabwe Essential Drugs Action Programme. Essential Drugs Survey.Ministry of Health, Harare,1991.
16. How to investigate drug use in health facilities: selected drug use indicators. Geneva: World Health Organization. WHO/DAP. 1993;93(1):1-87.
17. Soumerai SB, MC Laughlin TJ, Avorn J. Improving drug prescribing in primary care: A critical analysis of the experimental literature. Mibank Quarterly 1989;67(2):268-317.
18. Landgren FT. et al. Changing antibiotic prescribing by educational marketing. Medical journal of Australia 1988;149:595-599.
19. Quick J, Laing R, Ross-Degnan D. " Intervention research to promote clinically effective and economically efficient use of pharmaceuticals: The International Network for rational use of drugs." J. clin. Epidemiology, Vol. 11, Supp.II, pp 57s - 65s. 1991. 20. World Bank Development on Health 1993.