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Assessment of the Quality of Pharmaceutical Services in the Primary Health Care Facilities of Ethiopia

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A study was conducted between August 1997 and January 1998 to assess the quality of pharmaceutical services in primary health care facilities of Ethiopia. A total of 42 health centers and 88 health stations were selected, proportionate to size, using a stratified multi-stage random sampling method. Morbidity data indicated that respiratory tract infections, helminthiasis, gastritis, malaria, diarrhea, and skin diseases were the most frequent cases in these facilities' during 1995/96. The majority of the primary health care facilities used morbidity as the major criterion for drug selection and quantification. Although 80.9% of the health centers and 88% of the health stations used stock cards, 83.3% and 70.5% of the health centers and health stations respectively, reported the presence of expired drugs in their stores. This is despite the reported short supply of basic drugs. Findings of this survey show that 58.4% of primary health care facilities take drug inventory once a year, 16.3% twice a year, 9.6% four times a year and 7.8% do not take any inventory at all. Refrigeration and proper ventilation were observed in less than 60% of the facilities studied. Printed prescription papers were used in 81% of the health centers and only in 18.2% of the health stations. The rest of the health centers and stations either used ordinary or no paper at all. With regard to practice of polypharmacy, it was found out that the average number of drugs per prescription in health centers and health stations were 2.05 and 2.17, respectively. Retrospective analysis of prescriptions indicated that prescribing by generic names are overwhelmingly practiced over brand prescriptions. Further assessment of prescriptions revealed the presence of antibiotics in 50 % and 62 %, and injections in 30 % and 38 % of the prescriptions in health centers and health stations respectively.

Key words: Quality assessment, primary health care facilities, generic drugs, Polypharmacy, injectables, antibiotics.

INTRODUCTION

Assessment of the quality of service delivery in health facilities is receiving growing attention as a strategy for monitoring and evaluating primary health care programs in developing countries [1]. The provision of essential drugs is one of the eight Primary Health Care (PHC) component strategies [2]. Assessing the quality of pharmaceutical services in a standardized and objective way has been a difficult task until recently when WHO Action Programme on Essential Drugs (APED) developed a manual on "How to investigate drug use in health facilities" [3]. The indicators developed can be used to assess potential problems in drug use and to prioritize and focus subsequent efforts to correct these problems.

The actual delivery of health services in Ethiopia is carried out by the general and specialized institutions. The Ethiopian "General health Services" consists of six levels namely, community health posts, health stations, health centers, rural hospitals, regional hospitals and central referral hospitals [4].

Health centers and health stations are essential components of primary health care units as they are closer to larger segments of the population. The success of any health programme, including

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Essential Drug Programme, therefore, greatly depends on the quality of services rendered by such facilities. However, little has been done to assess the quality of pharmaceutical services in primary health care facilities of Ethiopia. Thus the objective of this study is to assess the quality of pharmaceutical services rendered by health centers and health stations using mainly the prescribing and facility specific indicators developed by APED/WHO [3].

MATERIALS AND METHODS

A descriptive cross-sectional study was conducted between August 1997 and January 1998 to assess the quality of pharmaceutical services in PHC facilities of Ethiopia. The health centers and health stations included in the study were selected using a stratified multi-stage random sampling proportionate to size. A total of 42 health centers and 88 health stations were sampled for the survey. At the time of the survey, the number of health centers and health stations in the country were 236 and 2314, respectively.

Data was collected through interviews and observations using structured questionnaires and inventory of the available facilities at each health institution. In addition, from each health institution 30 outpatient prescriptions were systematically selected and analyzed. The degree of polypharmacy, proportion of prescriptions with antibiotics and injectables were recorded and analyzed using an EPI-INFO statistical software in the form of frequency tables, percentages and proportions.

Operational Definitions

In this study, antibiotics refer to all antibiotics except topical, ophthalmic and anti-tuberculars; generic refers to drugs with chemical nomenclature with the exception of aspirin which was considered as a generic name because of its common use; and injectables refers to all injections except large volume infusions.

RESULTS

Disease pattern

According to the health institutions surveyed, respiratory tract infections (RTI), helminthiasis, gastritis, malaria, diarrhoea and skin diseases were the most frequent cases as reported by PHC facilities during 1995/96 (figure 1).

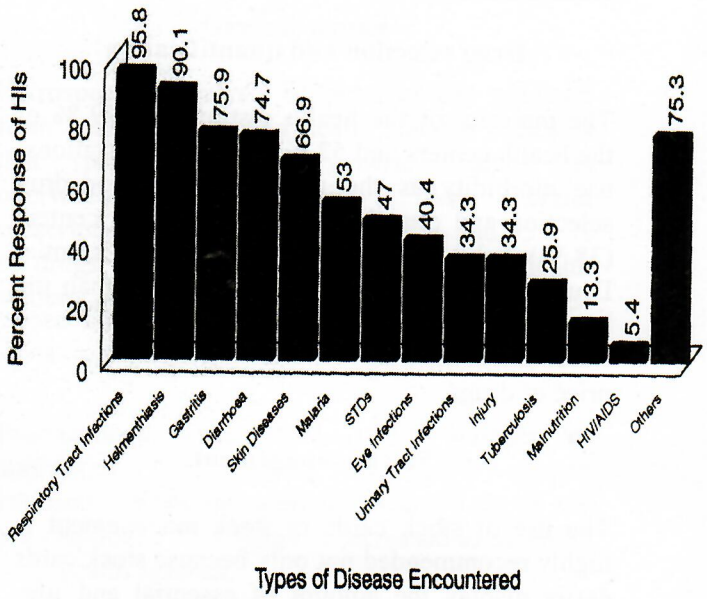

Figure 1: Top thirteen diseases seen by health institutions (n=130) in 1995/96, January 1998

Availability of basic drugs and supplies

Basic or life-saving drugs and supplies should be made available to health institutions throughout the year. As shown in Table 1, some of the basic drugs and supplies were in short supply in health institutions.

Table 1: Percentage availability of basic drugs and supplies in PHC facilities, January 1998

Drug/Supplies	Health Center	Health Station
Amoxacillin	45.5	3.4
Ampicillin	90.5	80.7
Procaine Penicillin	95.1	89.8
Chloramphenicol	61.9	43.2
Co-trimoxazole	85.7	50.0
Antituberculars	26.2	45.5
Antimalarials	95.2	92.0
ORS	23.8	18.2
Fluid and Electrolyte	92.9	44.3
Adrenaline	7.1	100.0
Syringe/Needle	85.7	69.3
Gloves	2.4	2.3

Drug selection and quantification

The majority of the health institutions (69 % of the health centers and 52 % of the health stations) use morbidity as the major criterion for drug selection and quantification. The health centers (38 %) make better use of the National Essential Drugs List as criteria for drug selection than the health stations (17 %). The other criteria used were previous drug consumption patterns and price of drugs.

Stock management

The use of stock cards in stock management is highly recommended not only because stock cards easily display the amount of essential and life-saving drugs on hand but also because they simplify planning, budgeting and control the utilization of drugs. The results of this survey show that 80.9 % of the health centers and 88 % of the health stations use stock cards.

A proper stock management minimizes the expiry of drugs. Results of this survey revealed that out of the 42 health centers and 88 health stations surveyed, 83.3% health centers and 70.5% health stations, respectively reported the presence of expired drugs in their stores during the 1996/97 fiscal year. Expired antituberculars were reported in all of the health centers; anthelminitics in about 55% of health centers and in 42% of the health stations; and respiratory drugs in about 31% of health centers and 27% of the health stations. Taking regular inventory of drugs helps to make a more accurate estimate of drug demand, to prepare a realistic drug budget and to minimize expiry of drugs. This survey documented that 58.4 % of PHC facilities take inventory once a year, 16.3 % twice a year, 9.6 % four times a year and 7.8 % none at all. Under these circumstances it will be a very difficult task, if not impossible, to allocate a meaningful drug budget and minimize drug expiry.

Drug storage

Drugs require appropriate storage conditions as these influence the shelf lives, the safety and efficacy of drugs. In view of this, the availability of adequate storage facilities was surveyed. The results are shown in Table 2.

Table 2: Percentage availability of storage facilities in PHC facilities, January 1998

Facility	Health Center	Health Station
Refrigerator	28.6	39.8
Ventilation	47.6	58.0
Electricity	76.2	35.2
Shelves	88.1	86.4

Proper drug arrangement is an important component of stock management. This survey revealed that drug arrangement in 76.2 % of the health centers and 69.3 % of the health stations were based on pharmacological classification. The arrangements in 2.4 % of the health centers and 12.5 % of the health stations were alphabetical. In the remaining 21.4 % and 18.2 %, of the health centers and health stations, respectively, drug arrangement was arbitrary.

All prescribers are expected to use appropriate prescription papers for prescribing drugs. In this study, 81 % of the health centers and only 18.2% of the health stations used printed prescription papers. 14.3 % and 56.8 % of the health centers and health stations used ordinary papers respectively. 4.8 % of the health centers and 25.0 % of the health stations used no prescription paper.

Table 3: Number of drugs per prescription and the corresponding number and percentage of prescriptions in PHC facilities, January 1998

Number of drugs per Prescription	Health Center		Health Station	
	Number of Prescriptions	% Prescription	Number of Prescriptions	% Prescription
Nil (Advice only)	12	1.1	14	0.7
One	304	27.4	478	25.0
Two	475	42.8	787	41.1
Three	261	23.5	460	24.0
Four	50	4.4	149	7.8
Five	7	0.6	24	1.3
>Five	1	0.1	2	0.1
Average number of drugs per prescription	2.05		2.17	

Assessment of printed prescriptions found in various levels of PHC facilities revealed that the following pieces of vital information were lacking in the prescription papers: name of patient (3.6 %); sex (15.5 %); age (14.3 %); address of patient (49.8%); date of prescription (1.2 %); name and signature of prescriber (3.6 %).

Number of drugs per prescription

The number of drugs in a prescription (poly pharmacy) is indicative of the rational use of drugs. As shown in Table 3, the average number of drugs per prescription in health centers and health stations were 2.05 and 2.17, respectively. 29 % of the prescriptions in health centers and 33 % in the health stations contain three drugs or more.

Age category

Age category of prescription indicates the type of patients in the various population subgroups (Table 4). This information in turn can be used to estimate the type of dosage forms (pediatric and geriatric) required.

Table 4: Number of prescriptions by age category in PHC facilities, January 1998

Age Category (Years)	No. of Prescriptions	Percentage
0 - 4	399	13.2
5 - 14	321	10.6
15 - 49	1848	61.1
50 - 64	180	6.0
65+	276	9.1

Generic names

Retrospective analysis of prescriptions obtained from health centers and health stations indicates that prescribing by generic names is overwhelmingly practiced over brand prescriptions. In this respect, 92.4 % and 95.2 % of drugs prescribed in health centers and health stations, respectively, were in their generic names.

Prescriptions containing antibiotics

Prescriptions were assessed for number of antibiotics they contain. In health centers antibiotics were included in about 50 % of the prescriptions. This figure is increased to about 62 % in health stations.

Prescriptions containing injections

Misuse of injections not only exposes the patient to unnecessary health risks but also has economic implications. This study revealed that about 28 % of the prescriptions in health centers and 37 % in health stations contained injections.

DISCUSSION AND CONCLUSION

Data on morbidity pattern is essential for proper selection, quantification and procurement of the most essential drugs in a particular country. The majority of PHC facilities in the present study reported that RTI was the most frequent illness in PHC facilities followed by helmenthiasis, gastritis/dyspepsia, diarrhea, malaria and skin

diseases. Analysis of the out patient report in Addis Ababa also revealed similar result [5]. Apart from reports obtained from health institutions, different community-based studies have also shown that ARI, diarrhea and malnutrition are the principle diseases in developing countries [6-8]. This might be due to the fact that ARI is common in children and that children constitute over half of the total population in developing countries.

The availability of essential drugs and supplies in sufficient quantities determines the quality of the health services. In this regard, the general availability of basic drugs in the studied PHC facilities at the time of the survey was satisfactory. This may be accounted for by the presence of different drug supply schemes such as *Leyou pharmacy* (recently established government pharmacies with revolving fund-scheme to supplement retail drug supply), ERRP and Bamako pharmacies in different parts of the country. It is however, interesting to note that ORS, the single most life saving drugs in children on diarrhea, was out of stock in more than 75 % of the facilities surveyed. In addition, disposable gloves were almost non-existent. The availability of such supplies is particularly important in the face of current Human Immune Virus/Acquired Immune Deficiency Syndrome pandemic. Hence, the concerned authorities and professionals should give due considerations when planning procurement of drugs and medical supplies.

A proper stock management is helpful in minimizing the expiry of drugs and stock out periods of essential drugs and supplies. Along this line, taking regular inventory, using stock control cards and proper arrangement of drugs in the store are very essential. If drugs are arranged systematically, tracing a specific drug is not only made easy but more importantly, it would simplify inventory taking and minimize the number of drugs that may expire. Moreover, it also assists in dispensing the right drugs or to provide patients with suitable substitutes. Although the use of stock cards in the studied facilities was encouraging, taking regular inventory and systematic drug arrangement in the stores seem to have been given less attention. The implication of this was evidenced by the fact that a significant percentage of the facilities reported the presence of expired drugs in their stores. In addition, most of the expired drugs were from the institutions with government-sponsored procurement. Therefore, drug supply problems, in most cases, are largely due to mismanagement [9]. Appropriate drug utilization required the use of standard prescription papers by health institutions. As compared to health stations, a higher proportion of health centers use printed prescription papers. This difference emanated from the fact that in the majority of the health stations, the prescriber at the same time is also the dispenser. However, using printed prescription to write the drug(s) to be prescribed by itself is not sufficient. It should contain the right information regarding the patient's name, age, sex, address and card number as well as the name of the prescriber and his/her signature. Along this line, a lot has to be done to standardize the prescription papers used in the PHC facilities of the country.

The consequence of poly pharmacy not only exposes the patient to unnecessary drug reaction but also has an economic implication. Moreover, compliance with the prescribed regimen is highly dependent on the number of drugs prescribed to a particular patient. Better compliance is reported with less number of drugs prescribed in a single prescription [10]. The average number of drugs per prescription in our study was found to be 2.11. This result is similar with the reports of other studies done elsewhere in Africa [11]. It is important to note at this point that the present study revealed that more than 30% of the prescriptions assessed were found to contain three drugs or more. This clearly calls for further training of PHC workers on the medical and economic implications of poly pharmacy.

One way of promoting rational drug use is through prescribing by generic names. This is particularly advantageous to patients. It saves unnecessary costs that may be incurred by the patient if brand products were to be prescribed. Analysis of prescriptions obtained from the two levels of governmental PHC facilities indicates that generic prescriptions overwhelmingly predominate over brand prescriptions. A similar result was documented in a study done by Desta *et al.* [12].

In Ethiopia, like in many other developing countries, most antibacterials are prescribed empirically irrespective of the availability of bacteriological laboratories [13]. The result of our present study reveals that nearly half of the prescriptions in health centers and about 62% in health stations were found to contain one or more antibacterials. This indicates that the use of antibacterials decreases with the increasing level of PHC facilities. This might be partly due to the fact that efficient utilization of bacteriological laboratories (health centers are better equipped than health stations) improves diagnosis and consequently contributes to the rational use of antibacterials.

Overuse of injections could lead to serious medical and economic consequences. From the economic point of view, it could result in unnecessary wastage of resources by making the treatment of patients more costly and from the medical point of view administering injections without adequate medical knowledge or sterilization procedures may entail risks of transmission of potentially serious pathogens such as hepatitis B and HIV. In this study, the number of patients exposed to injections was rather high in health stations. Similar results were observed in Northern Ethiopia [12] and in other African countries [14].

Generally, the findings of this study revealed that although there are good generic prescribing practice at PHC facilities, enormous efforts are needed to fully realize the concept of rational drug use particularly with respect to alleviating the problem of poly pharmacy, over use of injections and shortage of basic drugs. In this connection, it must be noted that professionals working at PHC levels should undergo service training and refresher courses on the concept of Essential Drug Programme in general and Rational Drug Use in particular so that they can better contribute to the quality of pharmaceutical services of the country.

REFERENCES

[1] WHO, Program for the control of Diarrhoeal Diseases: Health Facility Case Management Survey Guidelines. 1990, Geneva.

[2] WHO.DAP 92.5 Essential Drugs: Action for Equity, Geneva, pp.5.

[3] APED/WHO, How to Investigate Drug Use in Health Facilities: Selected Drug Use Indicators, 1993.

[4] Ministry of Health, Ethiopia, Master Plan for Ethiopian National Drug Programme (1996-2000) Addis Ababa.

[5] L. Freij, and G. Sterky, Eth. Med. J. 11 (1973) 101.

[6] B. Lindtjorn and G. Sterky, Eth. Med. J. 11 (1973) 101.

[7] J.K. Tumwine and S. Mackenzie, Afr. J. Med. 38 (1992) 30.

[8] J. Biddulph, Med. J. of Australia, 159 (1993) 41.

[9] A. Pezzino and M. Haile, World Health Forum, 12 p.175 (1991).

[10] G. Amare, T. Gedif, T. Alemayehu, B. Tesfahun, East Afr. Med. J. 74 (1997) 362.

[11] B. Lindtjoern, Trop. Doc. 17 (1987) 151.

[12] Z. Desta, T. Abula, L. Beyne, M. Fantahun, S. Ayalew, Survey on rational drug use in PHC facilities of Northwest Ethiopia, 1996. A paper presented on the 4th cycle local research grant workshop, Ethiopian Science and Technology Commission.

[13] A. Assefa and G. Yohannes, East Afr. Med. J. 73 (1996) 69.

[14] H.V. Hogerzeil, R.D. Bimo, B. Sntose, K.K. Kafle, A.F.B. Mabadeje and A.Y. Massele, Lancet, 243 (1993) 1408.