Original article

Service availability and readiness for diabetes care at health facilities in Ethiopia

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Abstract

Background: Non-communicable diseases (NCDs) are the leading causes of death globally. Available data demonstrate that nearly 80% deaths of NCDs occur in low- and middle-income countries. Of these deaths, an estimated 1.5 million, or 4% were due to diabetes. In Ethiopia, data on the preparedness of health facilities to cope with the rising epidemic of diabetes are insufficient.

Objective: This survey was aimed to assess service availability and readiness for diabetes health care.

Methods: The data used in this study is part of the 2014 Ethiopian service provision assessment survey which was conducted from 10 March to 25 July, 2014. The study employed stratified random sampling designed to provide representative results for Ethiopia. In this study, health facility types managed by different management authorities were included from the eleven administrative regions of the country.

There were a total of 873 health facilities included in this particular study. Data were collected using a facility inventory questionnaire that assessed whether the providers in the facility are prepared to provide required services to patients with diabetes. Information about readiness of facilities to provide good-quality client services on diabetes, including the availability of guidelines, trained staff, basic medical equipment, and essential medicines were also collected.

Results: Among all health facilities, 59% of health facilities offer services for diabetes. Forty percent of the facilities have diagnostic capacity for blood glucose while 56 % have capacity for urine protein test and 52 % has urine glucose test. Of the facilities that offer service for diabetes, 12 % of them had guidelines for diagnosis and management of diabetes at the service site during the survey. On the other hand, facilities that offer diabetes services were more likely to have basic equipment that support and enhance the provision of services.

Conclusions: The findings indicate that availability of treatment services, guidelines for diagnosis and management, trained staff and medicines for diabetes were found to be inadequate. But the availability of the basic medical equipment necessary for the diagnosis and management of diabetes appear to be adequate. Therefore, strengthening health care system towards improved service delivery through availing national guidelines, protocols or standards for managing diabetes, in-service training for providers, and provision of essential medicines are required to improve diabetes service delivery in health facilities. [*Ethiop. J. Health Dev.* 2017;31(2):110-118]

Key words: Diabetes Mellitus, Disease, Service, Availability, Readiness, Health Facility, Ethiopia

Introduction

Non-communicable diseases (NCDs) are the leading causes of death globally, killing more people each year than the deaths of all other causes in combination (1). Available data demonstrate that nearly 80% of NCD deaths occur in low- and middle-income countries (1, 2). Changes in the population structure and lifestyle result in the growing burden of chronic non communicable diseases like diabetes, which characterize the epidemiological transition which takes place at different paces in different parts of the world (2, 3). The developed world has taken over a century to complete the transition, while the rapidly developing countries of Asia and Latin America are undergoing a swift transition. In contrast, many sub-Saharan African countries are said to be experiencing a delayed transition (4).The burden of chronic diseases is increasing in low- and middle-income countries, while it remains stable in high-income countries (3). Almost 50 % of the adult disease burden in low- and middle income countries is now attributable to chronic diseases, and about 30 % of all deaths in these countries occur at ages 15 to 59, compared to 15 % in high-income countries (3). In a recent facility based study carried out in Ethiopia, of all patients with NCD, who were attending outpatient referral clinics of Addis Ababa Hospitals, 20% were patients with diabetes (5). In Ethiopia diabetes contributed to approximately 5% of all deaths in Capital city (6) and approximately 1.3% of deaths in Amhara region (7).

Despite their rapid growth and inequitable distribution, much of the human and social impact caused each year by high rates of premature diabetes death could be averted through well-understood, cost-effective and feasible interventions (8). The intervention to prevent diabetes needs to be part of the basic benefits package for moving towards universal health coverage (9-13). WHO's 2013 survey report (one what?) indicated that primary prevention and health promotion, detection of risk factor and disease management were most prevalent

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activities in the health care systems, with over 85% of countries reported offering risk-factor and disease management in their primary healthcare systems (14, 15). In low- and middle-income countries, the primary care level of the health system, which has to play critical role in delivering these interventions, is often the weakest. An evaluation of the capacity of primary care facilities in eight low- and middle-income countries showed major deficits in health financing, service delivery, access to basic technologies and medicines, medical information systems, and the health workforce. In most low- and middle-income countries, coverage of this essential individual intervention for prevention of diabetes is low (9).

Study on the assessment of health care system for diabetes in Addis Ababa showed that health infrastructure for diabetic care is below the standard (16). Another study on the cost of hospitalization for diabetic patients admitted at Tikur Anbessa Specialized Hospital was significantly higher than those hospitalized for non-diabetic reasons. In addition, the substantial proportion of the total cost of admission is utilized for treating acute and long term complications (8).

To date, there are no enough evidences to measure the availability of services for diabetes in Ethiopia. In fact, these are not indicators to measure constraints associated with service. Without consistent and accurate information on the availability of diabetic services, it is difficult for programmers or decision makers to evaluate the performance of health facilities as regards….that may guide them to take corrective action. Therefore, this study aims to assess service availability and readiness for diabetes care in health facilities of Ethiopia.

Methods

Study setting: In Ethiopia, the health sector has recently introduced a three-tier health care delivery system:
level one is a District/Woreda health system that comprises a primary hospital, health centres and their satellite health posts connected to each other by a referral system; level two general hospital, whereas level three is a specialized hospital (17). A total of 23,144 functional and formal sector health facilities are available in Ethiopia which included: 214 hospitals, 3,317 health centres, 15, 525 health posts, and 4,088 private clinics. Information on diabetes service was collected from a representative sample of health facilities that included hospitals, health centres and private clinics across the country. The report on service availability and readiness for non-communicable diseases was not applicable to health posts as health posts were not supposed to provide comprehensive services for NCD. Therefore, the reports presented below are applicable to hospitals, health centres and clinics.

Data Sources: The data used in this study were part of the 2014 Ethiopian service provision assessment Survey (SPA). The survey employed stratified random sampling designed to provide representative results for Ethiopia, for different facility types and different management authorities, and for each of the 11 administrative regions of the country. The sample size determination has been achieved by controlling the survey precision at region level and by facility type at national level. The sample size was determined by a combination of census of hospitals and random samples of health centres and private clinics in Ethiopia (18). The data are nationally and sub-nationally representative and comparable with other countries. A total of 873 health facilities were included in this analysis.

Measurement: Data were collected using a facility inventory questionnaire customized from the standard Measure DHS SPA tool and WHO SARA tools (19, 20) which was used to obtain information on how prepared facilities provide services for diabetes. Diabetes services were deemed to be available when the providers in the facility diagnose, prescribe treatment for, or manage patients with diabetes. After obtaining consent from the authorities of each health facility, the most knowledgeable provider of services to diabetes was interviewed by the data collectors. The two key areas related to the provision of diabetes services at the assessed health facilities comprised of the following: The availability of Service and readiness which addresses the readiness of facilities to provide good-quality client services for diabetes, including the availability of guidelines, trained staff, equipment, and essential medicines.

Data management and Analysis: All data editing programs were conducted using CSPro software. Descriptive analysis was performed using CSPro tabulation. The analyses considered only those items readily available and observed by the interviewers themselves during the survey. Services were deemed to be available when the providers in the facility diagnose, prescribe treatment for or manage patients with diabetes.

Ethical clearance: This study was approved by the scientific and ethical review office of the Ethiopian Public Health Institute, and obtained consent from the authorities of each health facility. The survey was conducted from 10 March to 25 July 2014.

Results

General overview of the surveyed facilities: The result included findings on diabetes for a total of 873 health facilities (214 Hospitals, randomly selected 292 health centres, and 367 clinics) all over the country. Over half (51%) of all the health facilities in this analyses were public, and 45 % were private for-profit health facilities. More than six in ten (61.6%) of facilities visited were from urban areas. Hospitals constituted 24.6%, Health Centres making the largest proportion at 33.4% of all facilities, lower clinics 20.4% while medium clinics 15.1% of the total health facilities visited (Table 1).

Availability of services for diabetes: Among all health facilities that offer services for non-communicable diseases, 59 % offer services for diabetes. The services for diabetes were widely available across all facility type (ranging from 63 % to 98 %) except in lower clinics (34%). Nearly all hospitals offer the services whereas about a third of the lower clinics offer the services for diabetes.

Diagnostic capacity and essential medicines for diabetes: Of all health facilities, 40% of them have diagnostic capacity for blood glucose while 56% has capacity for urine protein test and 52% has urine glucose test (Table 2). Among all facilities that offer services for diabetes the availability of glibenclamide, injectable glucose solution, metformin, and injectable insulin are 28%, 15%, 11%, and 9%, respectively at the time of data collection. Availability of medicines for diabetes varies by facility type, and is higher in hospitals when compared with other facility types (ranging from 90 % in hospitals to 0 % in clinics). Table 2 provides details on the diagnostic capacity, availability of essential medicines by type of health facility, managing authority and residential area (Table 2).

Readiness of facilities for diabetes

Guidelines and trained staff: Among the facilities that offer service for diabetes, 12% of them had guidelines for diagnosis and management of diabetes at the service site during the survey. This proportion ranges from 42% for referral hospital to 9 % for health centres. Only 3% of other governmental facilities (military, prison, federal police) were found to have guideline on diabetes compared with other managing authorities (14 %, and 11% for private for profit, and government organizations, respectively) (Table 3).

Among all facilities that offer diabetic services, only 6 % of them had at least one interviewed provider of services received in-service training on diabetes during the 24 months preceding the survey. Forty two percent of referral hospitals were more found to have trained staff on diabetes as compared to 12% in primary hospitals and 3% in health centres. However, lower clinics, health centre and medium clinics (1%, 3% and 4%, respectively) were the least likely to have trained staff compared with other facility types (Table 3 here).

Equipment: With the exception of a few items, facilities that offer diabetes services were found to have equipment that supports and enhances the provision of such services. For example, 93 % of facilities that offer diabetes services had a blood pressure apparatus. Seventy-six percent of facilities had adult weighing scale and nearly half of the facility had height board or stadiometer during the time of data collection (Table 3).

Table 1: **Total number of health facilities assessed by type of facilities, Ethiopia SPA 2014**

Facility type	Weighted	Unweighed	Percent	Public	Managing Authority		
					Other governmental	Private for profit	NGO
Referral hospital	2	32	0	31	0	0	1
General hospital	7	130	1	71	1	51	7
Primary hospital	3	52	0	44	1	4	3
Health center	182	292	16	290	0	0	2
Health post	802	292	69	292	0	0	0
Higher clinic	13	57	1	0	0	55	2
Medium Clinic	37	132	3	0	4	121	7
Low clinic	119	178	10	1	3	165	9
National	1,165	1,165	10	729	9	396	31

Table 2: **Among facilities offering services for diabetes, the percentages having indicated diagnostic capacity and essential medicines observed at the service site on the day of the survey, by background characteristics, Ethiopia SPA 2014**

	Diagnostic capacity			Medicines				
Background characteristics	**Blood glucose[1]**	**Urine protein[2]**	**Urine glucose[3]**	**Metformin**	**Glibenclamide**	**Injectable insulin**	**Injectable glucose solution**	**Number of facilities offering services for diabetes**
Facility type								
Referral Hospital	87	97	97	87	90	90	29	2
General Hospital	90	94	94	83	87	80	23	7
Primary Hospital	76	98	96	63	73	65	22	3
Health Center	29	58	52	10	42	7	15	114
Higher Clinic	85	91	91	10	10	12	6	12
Medium Clinic	80	83	79	1	2	1	15	36
Lower Clinic	6	5	5	0	0	0	14	40
Managing authority								
Government/ public	33	60	55	15	45	12	16	122
Other governmental (military, prison, federal police)	75	75	75	19	6	6	14	2
Private for profit	47	51	49	4	4	4	14	84
NGO (mission/ faith-based, nonprofit)	55	36	36	16	27	16	17	6
Urban/rural								
Urban	59	69	67	17	32	14	15	108
Rural	20	43	37	4	24	3	15	105
Total	40	56	52	11	28	9	15	214

Table 3: **Among all facilities offering services for diabetes: the percentages having guidelines, at least one staff member recently trained on diabetes, and the indicated equipment observed to be available at the service site on the day of the survey, by background characteristics, Ethiopia SPA 2014**

			Percentage of facilities offering services for diabetes that have:		Equipment			
Background characteristics	**Offering services for diabetes[1]**	**Number of facilities**	**Guidelines**	**Trained staff[2]**	**Blood pressure apparatus[3]**	**Adult weighing scale**	**Height board or stadiometer**	**Number of facilities offering services for diabetes**
Facility type								
Referral Hospital	97	2	42	42	97	77	58	2
General Hospital	97	7	25	38	92	76	58	7
Primary Hospital	98	3	27	12	96	76	47	3
Health Center	63	182	9	3	88	71	51	114
Higher Clinic	89	13	14	22	96	87	69	12
Medium Clinic	96	37	16	4	100	89	50	36
Lower Clinic	34	119	10	1	100	77	35	40
Managing authority								
Government/ public	64	190	11	5	88	71	51	122
Other governmental (military, prison, federal police)	100	2	3	0	100	97	91	2
Private for profit	51	163	14	7	99	82	46	84
NGO (mission/ faith-based, nonprofit)	77	8	10	1	100	92	45	6
Urban/rural								
Urban	72	149	17	9	96	81	56	108
Rural	49	214	7	2	90	72	42	105
Total	59	363	12	6	93	76	49	214

Discussion

In the present survey, diabetes diagnosis and management was found to be 59 % which is found to be the case at public health facilities than private for profit facilities. This finding was in contrast with a study from Tanzanian where private-for-profit facilities were more likely to provide diagnostic and /or management services for diabetes (21). This difference may have to do with current endeavor by the health sector's massive health system strengthening. The health sector development programs could be considered as the centerpieces for these achievements. In addition, changes in health care governance and health system management have been introduced. Decentralization in health care governance and management has been adopted. Furthermore, continuous efforts have been made in expanding health facilities, human resource development and health care financing in Ethiopia. The delivery of health services relies on the availability of appropriate infrastructure, basic medical equipment and medicines at facility level. Despite efforts made to improve strengthen health system, the high burden of mortality and morbidity from diabetes is still high. Yet, the responses in Ethiopia have not been comprehensive enough to contain the problem. The results presented in this study indicate that there have been insufficient availability of diabetes treatment services, guidelines for diagnosis and management of diabetes, trained staff and medicines. However, as compared to other countries, the findings indicated that those facilities offering diabetes diagnosis and/or management services in Ethiopia were higher than reports from surveys of other African countries, i.e 34% in Uganda(22), 32% in Zambia (23) and 12 % in both Tanzania and Sierra Leone(21). However, in Ethiopia a qualitative study conducted in 2014 shows that availability of health care and quality of service provision was raised as a critical problem for diabetes management (24).

In Ethiopia, among the facilities that offer service for diabetes, 12 % of them had guidelines for diagnosis and management of diabetes at the service delivery site during the survey which is similar to reports from Sierra Leone (23).

The availability of guidelines for diagnosis and management of diabetes are crucially important in facilities where most services are provided by non-medical doctor clinicians and nurses (21). The availability of guidelines in Uganda survey was higher 83% (22) than the findings in Ethiopian (12%). Without availability of guidelines, early diagnosis and management of diabetes can be severely hampered (ref).

Studies have demonstrated that the lack of proper training of health professionals on diabetes accounts for the high non-compliance rates and serious complications such as: (22). In this study, the number of providers who received in-service training for diabetes is very low. Among all facilities that offer services for diabetes, only 6 % of had at least one interviewed provider received in-service training during 24 months preceding the survey. The providers who received in-service training during 24 months prior the survey in Ethiopia is lower than findings from Uganda survey where about 31% facilities had staff trained on diabetes diagnosis and treatment (21).

The availability of basic medical equipment necessary for the diagnosis and management of diabetes appears to be adequate in Ethiopia. Facilities that offer diabetes services are more likely to have equipment that supports and enhances the provision of such services. For example, about nine of every ten facilities have blood pressure apparatus, and more than seven of every ten facilities have adult weighing scale during the survey. However, the availability of basic medicines required for the treatment of diabetes in Ethiopia is very low. Results of survey depicted that among all facilities that offer diabetes services, only 11 % of them had Metformin, 28 % of them had Glibenclamide, and 9% of them had injectable insulin, and only 15 % of them had injectable glucose solution on the day of the visit.

Hospitals were more likely to have the drugs for diabetes treatment than other health centres and clinics, with a range of proportion ranging from 90% in referral hospital to 4% private-for-profit facilities. According to the 2010 global non-communicable diseases, capacity assessment report on essential medicines for the management of diabetes were generally available for the vast majority of countries, with markedly low availability in low-income countries 7% and in the South-East Asian Region 9% (14). Findings from Ethiopian and Tanzanian showed where the availability of essential medicines for diabetes was more prevalent in Hospitals than other facility types.

More than six in ten (61.6%) of facilities visited for this particular study were from urban areas. The main reason for high distribution of facilities in urban area could be due to the exclusion of health posts that serve in the rural areas which were not supposed to offer services for non-communicable diseases in Ethiopia. The other reason could also be most of the surveyed facilities for diabetes was private facilities and hospitals which were highly populated in urban areas than rural areas.

Limitation of the study

The authors would like to disclose that the findings of the study would have been stronger had viewpoints of health providers been captured in the study. Because, including perspectives of providers would have supplemented the quantitative findings of the present study.

Conclusion:

The findings depicted a wide gap and must be addressed if basic standards are to be met by the health care system. Thus, health care system strengthening including provision of evidence-based national guidelines, protocols or standards for managing diabetes, provision of in-service training for providers

and availing essential medicines need to be urgently addressed.

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Competing Interest
Authors declare that they have no competing interest.

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