

Prevalence of Diabetes Mellitus Disease and its Association with Level of Education Among Adult Patients Attending at Dilla Referral Hospital, Ethiopia

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Abstract

Diabetes mellitus is becoming one of the major health problems in the developing countries. As the International Diabetes Federation suggests that the number of adults living with diabetes worldwide was increasing from time to time. The aim of this study is to assess the educational level of Diabetic patients as well as service given to them and the frequency of the disease over last four years at Dilla Referral Hospital. Data was collected through self administer/interviewer administer questionnaire and document review. According to this finding more exposure to diabetes disease, it must be was found an illiterate individuals 15 (37.50%) followed by Primary school, College and University level individuals 9 (22.50%), 6 (15.00%), 5 (12.50%) respectively. Diabetes type II diseases were highly prevalent across the year than Diabetes type I. The prevalence of diabetes mellitus is increasing and type II is more predominate than type I at Dilla Referral Hospital. Therefore, appropriate actions need to be taken to provide access like education and treatment in order to reduce associated complications.

Keywords: Diabetes mellitus; Diabetes type I; Diabetes type II; Dilla referral hospital

Introduction

Diabetes Mellitus (DM) is defined as a cluster of metabolic disorders, characterized by hyperglycemia high enough to significantly increase the incidence of a specific unique type of microangiopathy (retinopathy, nephropathy and neuropathy) [1,2]. DM is a chronic metabolic disorder that represents a serious public health concern. It is characterized by defective insulin secretion or deficiencies in the action of insulin. The prevalence of diabetes mellitus has now reached epidemic proportions in both developed and developing countries, affecting more than 366 million people suffer from DM and the number is expected to rise to 552 million by 2030 [3]. The incidence of diabetes worldwide is now estimated to be around 366 million, far beyond the 285 million projected by the World Health Organization (WHO) for 2010 from global statistics gathered in 2008 [4]. International Diabetes Most of this increase will occur as a result of 150% rise in developing countries. This number is likely to increase in the coming years as a result of an ageing global population, urbanization, rising prevalence of obesity and sedentary lifestyles. It is estimated that developing countries will bear the brunt of DM epidemic to the extent of 77% of the global burden in the 21st century as a result of population growth, ageing, unhealthy diets, obesity and sedentary lifestyles [5].

Type 1 diabetes mellitus (T1DM) is one of the most common endocrine and metabolic conditions in childhood. Data from large epidemiological studies worldwide indicate that on an annual basis, the overall increase in the incidence of T1DM is around 3% and about 78,000 children under age 15 years develop T1DM worldwide [3]. Environmental factors have long been implicated in the pathogenesis of T1DM both as initiator and potentiators of pancreatic β -cells destruction [6].

Type 2 Diabetes mellitus (T2DM) is a metabolic disorder characterized by the presence of chronic hyperglycemia, which results from resistance to insulin actions on peripheral tissues as well as inadequate secretion of insulin [7] and an impaired suppression of glucagon secretion in response to ingested glucose. Thus, T2DM involves

at least two primary pathogenic mechanisms: (a) a progressive decline in pancreatic islet cell function resulting in reduced insulin secretion and inadequate suppression of glucagon secretion [8,9] and (b) peripheral insulin resistance resulting in a decrease in the metabolic responses to insulin (American Diabetes Association, 2010). The resulting insulin deficiency disrupts the regulation of glucose production in the liver and is a clue element in the pathogenesis of glucose intolerance [10]. Type 2 diabetes mellitus is a complex metabolic disorder of heterogeneous etiology with social, behavioral, and environmental risk factors unmasking the effects of genetic susceptibility [11]. There is a strong hereditary (likely multigenic) component to the disease, with the role of genetic determinants illustrated when differences in the prevalence of type 2 diabetes mellitus in various racial groups are considered [12].

Diabetes affects virtually every organ system in the body and the duration and severity of the disease may have a direct impact on organ involvement. Diabetes Mellitus (DM) is a chronic progressive metabolic disorder characterized by hyperglycemia mainly due to absolute (Type 1 DM) or relative (Type 2 DM) deficiency of insulin hormone [1]. DM virtually affects every system of the body mainly due to metabolic disturbances caused by hyperglycemia, especially if diabetes control over a period of time proves to be suboptimal [1]. Diabetes mellitus is associated with a wide range of circulatory manifestations such as alterations in endothelial function and cardiovascular disease [13,14]. Most of the complications in diabetes are due to hyperglycaemia and increased generation of oxygen derived free radicals, which may lead

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Received December 03, 2014; Accepted February 28, 2015; Published March 03, 2015

Citation: Alemu F (2015) Prevalence of Diabetes Mellitus Disease and its Association with Level of Education Among Adult Patients Attending at Dilla Referral Hospital, Ethiopia. J Diabetes Metab 6: 521. doi:10.4172/2155-6156.1000521

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to vascular dysfunction [15,16]. Long term diabetes is associated with several co-morbidities, such as erectile dysfunction, blindness, poor wound healing, kidney failure, heart disease, etc; as a result of considerable damage, dysfunction, and failure of various organs that develop as the disease progresses [17].

Ethiopia is the second most populous country in sub-Saharan Africa where more than 80% of the population lives in the country side. The country experiences a heavy burden of disease mainly attributed to communicable infectious diseases and nutritional deficiencies. Currently, Ethiopia is also challenged by the growing magnitude of chronic non communicable diseases. Despite major progresses in education, the literacy status of the population of Ethiopia is still low with total adult literacy rate of 36% (62% for male and 39% for female). The education level in the country is still a significantly marker influencing the spread of disease, shaping the health seeking behavior of individuals and communities including the utilization of modern health care service (<http://www.moh.gov.et/>; <http://www.ethiomedic.com/>).

The estimated prevalence of DM in adult population of Ethiopia is 1.9% [18,19]. Furthermore the prevalence of diabetes among older subjects in Ethiopian (age>40 years) was higher (2.4%) [20]. According Megerssa et al. [21] was reported that on diabetic patients in Ethiopia, 62.3% were males and 37.7% females and the age ranged from 20 to 70 years old. Moreover, Cohen et al reported a high prevalence of diabetes (8.9%) among young (age<30 years) Ethiopian Jews who have been to Israel for less than 4 years [22]. WHO estimated the number of diabetic cases in Ethiopia to be 800,000 by the year 2000, and the number is expected to increase to 1.8 million by 2030 [23] Diabetes mellitus is emerging as one of the major chronic health problems in Ethiopia, although its incidence and prevalence are still unknown in the general population [24]. In Ethiopia, national data on prevalence and incidence of DM are lacking. However, patient attendance rates and medical admissions in hospitals are rising [25].

In addition IDFA reported Ethiopia to be ranked 3rd among the ten top countries in Africa with 1.4 million DM cases and estimated prevalence of 3.32% by year 2012. World Health Organization (WHO) estimated in 2011 [26] that 34% of Ethiopian population is dying from non-communicable diseases, with a national cardiovascular disease prevalence of 15%, cancer and chronic obstructive pulmonary disease prevalence of 4% each, and diabetes mellitus prevalence of 2%. Data on DM are scarce in Ethiopia. Most clinical data are not timely reviewed and made available for decision makers. This paper tries to show the trend in the burden of DM in the Ethiopian context, which is crucial input for planning health services for the needy and preventing premature adult deaths [27,28]. Despite the above estimations for global prevalence of the four major non-communicable diseases, cardiovascular disease, cancer, diabetes mellitus, and chronic obstructive pulmonary disease were not well-documented in Ethiopia. On the other hand, accurate information on the prevalence of major public-health importance is required to have informed health policy decision [29,30]. Therefore, it is crucial to document prevalence estimations for the major non-communicable diseases for the purposes of research and interventions. Purpose of this study is to assess the educational level of Diabetic patients as well as service given to them and the frequency of the disease over last four years at Dilla Referral Hospital.

Material and Methods

Description of the study area

This study was conducted at Dilla Referral Hospital where found in

Gedeo zone in the south west of the Country, Ethiopia. It was far 359 Km from South of city of Ethiopia (Addis Ababa). The town is found on altitude of 1300-300 meter above sea level and climate condition is weynadega and it average rain fall is from 760-1700 meter/year. The geographical location on the town lies between 7°39 north latitude and 35°24 to 37°90 East longitude. The town is surrounded in North by Sidama, in South by Wenago, in east by Bale Oromiya and West by Oromiya Regional state. The study was conducted from November to July 2014.

Study design

The study was designed to get information on assessment of medical and social assistance for diabetic patients attending Dilla Referral Hospital.

Study population

The study population was diabetic patients who visited Dilla Referral Hospital from 2011 to 2014 year. The study population and sample size were patients who visited (diagnosed) at Dilla Referral Hospital. The total number of sample size was 40 diabetic patients which are interviewed.

Sampling technique

This study was used the simple random sampling methods to get real, relevant and detail information from diabetic patients who are follow up at Dilla referral hospital.

Data collection and Source of data

The secondary data was obtained from Dilla Referral Hospital from registration documents. These documents were consist diabetic patients history from 2011 to 2014 year. The data was organized with respect to age and sex group. Around 40 diabetic patients were interviewed and 40 questionnaires were distributed and recollected after being filled by diabetic patients excluding uneducated patients.

Ethical clearance

The study protocol was reviewed and ethically approved by Dilla University ethical and clearance committee. Before data collection, an informed consent was obtained from respondents. The confidentiality of the respondents was maintained.

Data analysis

Data entry and analysis was performed using the statistical package for Social Sciences for Windows SPSS (version 16.0). For analysis of the percentage and total diabetic patients were follow up at Dilla Referral Hospital. The results were expressed graphically and as tabular.

Results

Characteristics of the study

Out of the total 40 study participants planned where 23 (57.50%) were female and the remaining 17 (42.50%) were male. The age ranges were 15-49 all participate. More than half (57.50%) of them were female.

Level of education among diabetic patients

Education status had a significant association with Diabetes risk factor. Because according to this finding more exposure to diabetes disease were found on an illiterate individuals 15 (37.50%) followed by Primary school, College and University level individuals 9 (22.50%), 6 (15.00%), 5 (12.50%) respectively as indicated in the Table 1.

Service given towards diabetic patients at dilla referral hospital

Twenty six (65.00%) of the study participants had to evaluate assistance were good and around (22.50%) were not effective. Eighteen (45.00%) of the study participants were faced to a problem during appointed to follow up at Dilla Referral Hospital as well as more than half (55.00%) of the study participants did not faced any problem when they were appointed to follow up their health status at this Hospital as indicted in Table 2.

According to the secondary data obtained from Dilla Referral Hospital, indicated the diabetic patients were increased across the year 2011-2014 as indicated in Table 3.

As indicated in the Figure 1 the type of diabetes disease prevalence of among the males were 50.00% type II followed by type I (20.00%) in 2011.

As indicated in the Figure 2 the type of diabetes disease prevalence of among the female, type II diabetic disease were highly predominant than type I diabetic disease.

As indicated in the Figure 3 the number of diabetic patients were increased from 2011-2014 at Dilla Referral Hospital.

Discussion

According the results showed that educational status had significant

association with good practice like that of knowledge. This finding was showed that more diabetic patients were an illiterate individuals followed by Primary school, College and University level of education. According Megerssa et al. [21] had reported on Diabetic patients in Ethiopia, education profile of the participants who respond showed 57% (n=232) of the participants had primary or secondary education, the remaining 43% (n=175) had college or university education. This finding was consistent with study in Egypt [31]. This could be attributed that participant who had education have good chance to modify their life style and their health status by finding different alternatives for checkup. Educated people may also have better income better income status. This could also be their accessibility for manual of dietary management, weight reduction increases. According Megerssa et al. [21] had reported on modifiable and non modifiable risk factors for diabetic disease in Ethiopia, in modifiable risk factors relatively higher prevalence of undiagnosed DM was observed in those overweighted (9.76%), higher WC (9.88%), ex-smokers (11.11%), physically inactive (7.69%), hypertensive (13.51%), frequent alcohol drinker (8.64%), high TC (5.42%) and high TG level (7.8%) as compared to their counterparts. In most of the series, prevalence was found to increase with increasing age [32-37]. Most patients (51.2%) did not realize the importance of screening the other family members for diabetes and according to some literatures this might probably indicates for a large number of people remaining undiagnosed [38].

Lower age was significantly associated with knowledge. This finding was supported by other different literatures [31,39,40] and with

Sex	Age category	Number of diabetes patient attending at Dilla Referral Hospital at 2014	Educational level				
			Illiterate	Primary school	Secondary school	College	University
Male	<15 age	0	-	-	-	-	-
	15-49 age	16	7 (17.50%)	2 (5.00%)	2 (5.00%)	5 (12.50%)	1 (2.50%)
	>49 age	3					
	Total	19					
Female	<15 age	0	-	-	-	-	-
	15-49 age	19	8 (20.00%)	7 (17.50%)	3 (7.50%)	1 (2.50%)	4 (10.00%)
	>49 age	2					
	Total	21	15 (37.50%)	9 (22.50%)	5 (12.50%)	6 (15.00%)	5 (12.50%)

Table 1: Frequency of Diabetes Millets patients at each educational level at Dilla Referral Hospital 2014.

Types of questionnaires to the Dilla Referral Hospital attending patients at 2014	Target answered questionnaires	Sex	
		Male	Female
1. How do you evaluate the assistance provide to relief from you?	Good	15 (37.50%)	11 (27.50%)
	Bad	4 (10.00%)	1 (2.50%)
	Not effective	4 (10.00%)	5 (12.50%)
2. When you are appointed to follow up your health status in the hospital, have you faced problem?	Yes	10 (25.00%)	8 (20.00%)
	No	12 (30.00%)	10 (25.00%)
3. Have you faced any problem related with social relationship due to being diabetic patient?	Yes	6 (15.00%)	3 (7.50%)
	No	13 (32.50%)	14 (35.00%)

Table 2: Distributed questionnaires to diabetic patients attending at Dilla Referral Hospital and their response 2014 year.

Year	Sex				Total patients per year
	Male		Female		
	age range>15		age range>15		
	Types diabetes disease		Types diabetes disease		
	Type I	Type II	Type I	Type II	
2011	4 (20.00%)	10 (50.00%)	1(5.00%)	5 (25.00%)	20
2012	13 (26.53%)	18 (36.73%)	6 (12.24%)	12 (24.50%)	49
2013	13 (15.85%)	31 (37.80%)	11 (13.42%)	27 (32.93%)	82
2014	25 (7.58%)	190 (57.57%)	30 (9.10%)	85 (25.75%)	330

Table 3: Frequency of diabetic disease among each year at Dilla Referral Hospital 2011-2014.

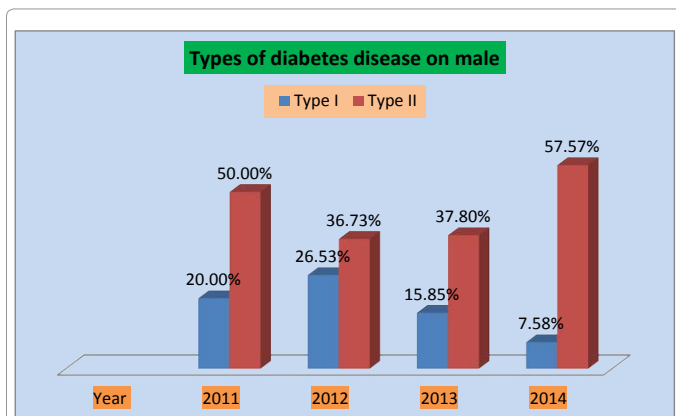


Figure 1: Distribution of type of diabetes among male respondents from data got through document review retrospectively from 2011-2014.

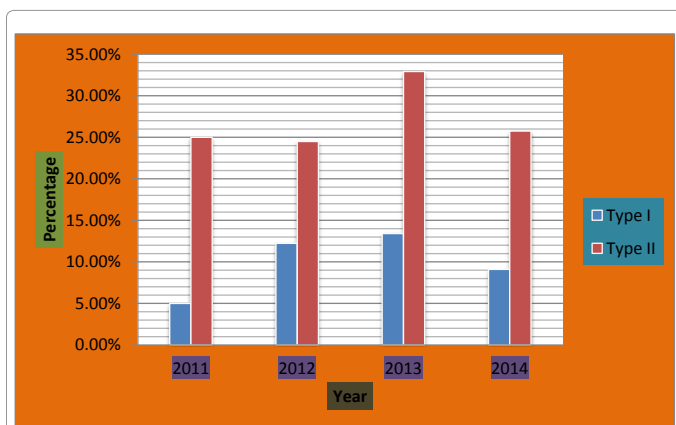


Figure 2: Distribution of type of diabetes among female respondents from data got through document review retrospectively from 2011-2014.

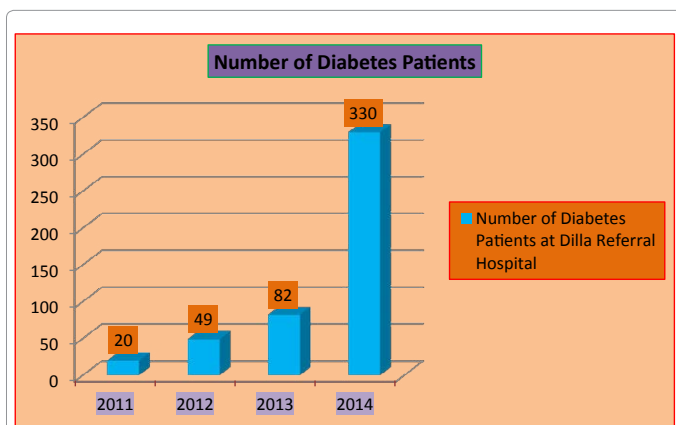


Figure 3: The number of diabetic patients in each year from 2011-2014 at Dilla Referral Hospital.

West and Goldberg principles which reported that a decrease of 3% in the knowledge score of diabetic patients for every 10-year increase in age [41]. This could be due to older persons have less education, worse cognitive function and have more co-morbidities, which might lead to confusion [40]. Another explanation might be younger patients were more likely to be more educated, faster in remember and recall and

they might be new sufferers of diabetes and they were eager to have more knowledge about their disease [31].

Regarding to the impacts came from social relationship due to being diabetes patients were a little (22.50%) while more than half patients (67.50%) were not faced any problem came from social relationship due to being diabetes patients. These findings indeed underscore the critical role played by patient awareness and practice of diabetes self management behaviors in improving adherence to drug therapy, ensuring achievement of adequate glycemic control and minimizing the likelihood of diabetic complication [42,43].

Diabetes type II diseases were highly predominated diseases across the year than Diabetes type I from 2011-2014 at Dilla Referral Hospital. Similar finding from Gondar University Teaching Referral Hospital had reporting by Abebe et al. [44], findings show that the proportion of DM patients has significantly increased over the 10 year observation period (2000-2009) in the study hospital for both Type 1 and Type 2 DM.

Type II diabetic disease were highly predominate in all patients at each year from 2011-2014, were 50.00%, 36.73%, 37.80%, and 57.57% were type II patients, while, 20.00%, 26.53%, 15.85% and 7.58% with type I patients from 2011-2014 on males. About 65.6% of the Type 1 DM patients were men while about 51% of the women had Type 2 DM [44].

The types II slightly increased across the year when it compared with type I diabetic disease on females. There were more Type 1 DM patients in rural areas compared to urban residents, and much more Type 2 DM patients were from urban areas compared to rural areas [44]. However, T1DM was found to be more prevalent in girls than in boys in studies from Ethiopia, Sudan, Nigeria, and Libya [33,45-48].

The numbers of diabetic patients currently were 330 and it was the highest number of patients at 2014 at Dilla Referral Hospital. Similar, Ethiopia is one of the top five countries with the highest number of people affected by DM in (SSA). Previous reports showed that the prevalence of DM in Ethiopia was 2.5% in the year 2000 and was estimated to rise to 3.5% by 2030.

Conclusion

Diabetes care in developing countries needs to address the specific background of the patients' population, the rate of disease prevalence in study area and social constraints. The frequency of diabetes mellitus disease at Dilla Referral Hospital is increasing steadily. Type II diabetic disease were highly predominate in all patients at each year from 2011-2014, were 50.00%, 36.73%, 37.80%, and 57.57% were type II patients on males sex. The types II slightly increased across the year when it compared with type I diabetic disease on females. In addition, diabetic patients were increased across the year 2011-2014 at Dilla Referral Hospital. Therefore, this finding calls attention to the urgent need for monitoring diabetes mellitus disease in order to facilitate timely preventive and curative interventions.

Acknowledgments

The author would like to express heart fully thanks to Dilla Referral Hospital for providing secondary data for this study.

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