

Prevalance of Diabetes Mellitus Patients Attending Robe Hospital, Robe, Bale Zone, Ethiopia: A Research Article

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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 the study was to know the prevalence of diabetes mellitus in patients attended Robe hospital; a three year's retrospective record review (2015- September 2017) of medical OPD logbook was conducted. The data was analyzed by using SPSS version 19. Out of 22277 patients were attended in robe hospital, out of these 1227 patients have symptoms and complications related to diabetes mellitus, of these 320 patients were found positive Diabetes Mellitus. Among the total 320 diabetes mellitus patients, 190 (59.37%) were males and 130 (40.63%) were females. Most of the patients, 283 (88.43%), had type 2 diabetes mellitus while 37 (11.56%) of them suffered from type 1 diabetes. Though the 1.43% prevalence of diabetes mellitus observed in this study is lower than the national estimate, still it indicates a considerable burden in the locality.

Keywords: Diabetes Mellitus, Diabetes type I, Diabetes type II, Medical OPD, Robe Hospital

INTRODUCTION

Diabetes Mellitus (DM) is a clinical syndrome comprising a heterogeneous group of metabolic diseases that are characterized by chronic hyperglycemia and disturbances in carbohydrate, fat and protein metabolism secondary to defects in insulin secretion, insulin action or both. The three most common forms of diabetes are type 1 diabetes, type 2 diabetes and gestational diabetes (WHO, 1999; Zaoui *et al.*, 2007). 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 (Danaei *et al.*, 1980). 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 (Cho *et al.*, 2005).

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 (Knip and Simell, 2012). 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 (Danaei *et al.*, 1980). Environmental factors have long been implicated in the pathogenesis of T1DM both as initiator and potentiators of pancreatic β -cells destruction (ADA, 2010).

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 (Müller *et al.*, 1970) 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 (Weyer *et al.*, 1999; Gastaldelli *et al.*, 2004) 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 (Kiess *et al.*, 2003). 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 (Florez, 2008). 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 (Hermans, 2007). 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 (Gill *et al.*, 2009).

Ethiopia is the second most popular 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. The estimated prevalence of DM in adult population of Ethiopia is 1.9% (Alemu *et al.*, 2009; Watkins and Alemu, 2003). 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 (Abdulkadir and, Reja, 2001). 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 (Tamiru and, Alemseged, 2010). 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.

Statement of the Problem

Globally, diabetes mellitus is emerging as one of the most common chronic illnesses with an estimated number of 220 million people in 2010. Of these, approximately 12.1 million were living in Africa. In Ethiopia, national data on prevalence and incidence of diabetes are lacking. However, patient attendance rates and medical admissions in major hospitals are rising. The estimated prevalence of DM in adult population of Ethiopia is 1.9%. Therefore this study gives insight about the prevalence of DM.

Significance of the study

Regular screening of patients is essential for early detection and care. There are limited studies on Diabetes awareness and prevalence in rural communities. Hence this prevalence study was undertaken. In the short term healthcare expenditure will be saved. In the long term a better prognosis, maintenance or improvement in quality of life in patients with Diabetes. Data on Diabetes patients in Ethiopia are inadequate. Therefore this study will be helpful in understanding the prevalence of Diabetes patients, and provides policy makers and NGO's with relevant information for further planning and interventions. At last, it will be used as input for further research.

Therefore, the objective of this research is to assess the prevalence of Diabetes Mellitus patients attending in Robe hospital, Robe town, Bale zone, Ethiopia from 2015 – September 2017.

MATERIALS AND METHODS

Description of the study area

The study was conducted at Robe Hospital, in Robe city. Robe is the capital city of Bale Zone, Oromia Regional State, and South Eastern Ethiopia. Robe city is located at 430 km south east of Addis Ababa. The area is situated at 7°00' N and 39°58' E Latitude and longitude respectively. The mean annual rainfall and temperature of 358 mm and 15.26 °C respectively (Goba Metrology department). Total population of Robe city is 72,520 (CSA, 2014). As an ART(2014) report Bale zone have 1 capital city (Robe), 4 Governmental hospitals, and 84 public health centers in the city and the village and 19 medium clinic in Robe.

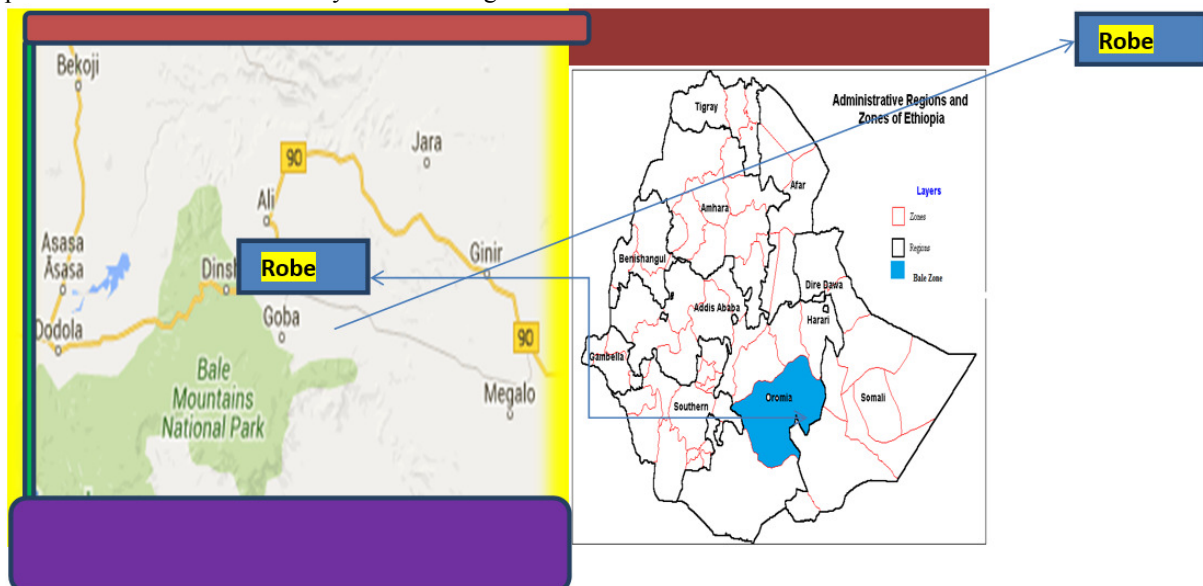


Figure.1 Map of study area

Study Design

To study the prevalence of diabetes mellitus in patients attending Robe hospital, a three years retrospective record review (2015-2017) of medical OPD logbook was conducted. The variables included in the data collection questionnaire were patient identification card, age, sex, marital status, level of education, occupation.

Study population

The study population was patients who visited Robe Hospital from 2015 to September 2017. The study population and sample size were patients who have the symptom of Diabetes Mellitus at Robe Hospital. The total number of sample size was 22277.

Data collection and Source of data

The secondary data was obtained from Robe Hospital from OPD log book registration documents. These documents were consist patients who have the symptom of Diabetic Mellitus from 2015 to September 2017. The data was organized with respect to age, sex, marital status, level of education.

Ethical consideration

Ethical clearance was secured from the Department of Chemistry, College of Natural and Computational Sciences, Madawallabu University. Following that cooperation letter was written to Robe hospital. Thus, the study was commenced after obtaining permission from the hospital management. In addition, the whole objective of the study was briefly explained to the hospital authorities as well as for those working in the medical outpatient department of the hospital, so that got permission. Moreover, confidentiality was strictly maintained throughout the study period.

Statistical analysis

Data was entered in to excel sheet, cleaned, exported to and analyzed using SPSS version 19. Descriptive summary of the study participants was presented in terms of frequency, range and proportions.

RESULTS

To study the prevalence of diabetes mellitus, a retrospective record review of medical OPD log book was conducted for a total of 22277 patients attended the robe hospital within the period 2015 to September, 2017 out of which 1227 patients has diabetic symptoms and complications, among these 320 patients had positive Diabetes Mellitus and prevalence level was 1.43%. Out of these patients majority of them were male 740 (60.30%) and remaining 487 (39.70 %) were females (Table.1)

Table. 1. Total number of diabetes mellitus symptoms related patients attended in Robe hospital

	Total Number of DM symptoms related patients	Total Number of DM Patients
Male	740	190
Female	487	130

Based on their age distribution more numbers were between 15 to 19 age group (46.04%) followed by more than 40 age (42.37 %) and less than 15 age (11.5%)(Table.2)

Table. 2. DM patients divided based on their age group

Age	Male	Female	Total Number of DM symptoms related patients
	Number of DM symptoms related patients		
<15	87(11.76%)	55(11.29%)	142
15 - 49	340(45.95%)	225(46.20%)	565
>49	313(42.30%)	207 (42.50%)	520

The majority of the patients were illiterate (60.31%) followed by primary school (24.67 %), secondary school (9.94%) and least higher education (4.07 %). The marital status the more number of the patients were married (61.12%) followed by single (27.30), separated (8.15 %) and Divorced. (Table 3 and 4)

Table. 3. DM patients were classified based on their education level

Level of Education	Total Number of DM symptoms related Patients
Illiterate	740 (60.31%)
Primary School	315 (25.67%)
Secondary School	122 (9.94%)
Higher Education	50 (4.07%)

Table. 4. DM patients were classified based on their marital status

Marital Status	Total Number of DM symptoms related patients
Single	335 (27.30%)
Married	750 (61.12%)
Divorced	42 (3.42%)
Separated	100 (8.15%)

According to the secondary data obtained from Robe hospital, indicated diabetic patients were increased every year from 2015 to 2017. Out of the 1227 diabetes mellitus symptoms related patients, 320 patients showed positive diabetes mellitus, of these 190 (59.37%) were males and 130 (40.63%) were female diabetes patients. In this study the majority of the patients were suffered with type II diabetes mellitus (88.44%) remaining was (11.56%) type I diabetes mellitus. (Table .5 and Figure.2)

Table.5. Diabetes mellitus patients attended in Robe hospital from 2015 to 2017

Year	Male			Female			
	Type I	Type II	Total Number of DM Patients	Type I	Type II	Total number of DM Patients	Total number of DM Patients per year
2015	6(11.32%)	30(56.60%)	36	1(1.89%)	16(30.19%)	17	53
2016	3(7.14%)	32(76.19%)	35	0 (0%)	7(16.67%)	7	42
2017	15(6.67%)	104(46.22%)	119	12(5.3%)	94(41.78%)	106	225

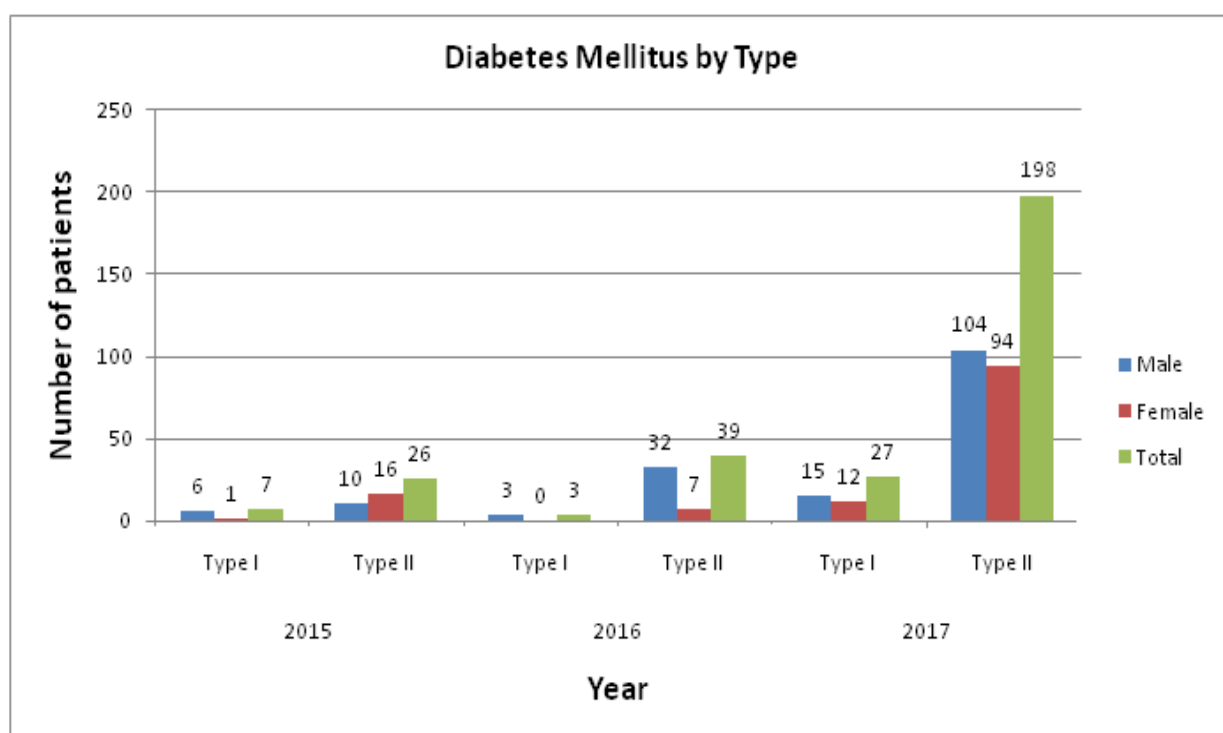


Figure.2. Type I and type II Diabetes Mellitus patients by number and year.

DISCUSSION

The study of prevalence of diabetes mellitus, a retrospective record review of medical OPD log book was conducted for a total of 22277 patients attended the robe hospital within the period 2015 to 2017 out of which 1227 patients has diabetic symptoms and complications, among these 320 patients had positive Diabetes Mellitus. This study has showed that the prevalence of DM is 1.43%. Our finding was lower than the national prevalence in Ethiopia, 1.9% (Solomon et.al 2013). Similarly it is also lower than the African region prevalence which was estimated as 4.9% (IDFDA, 2013).

Out of 1227 DM symptoms related patients, the majority of the patients were illiterate (60.31%) followed by primary school (24.67%), secondary school (9.94%) and least higher education (4.07%). The finding of the current study is supported by the Iranian study that reported DM was significantly observed in illiterate people, more so than in other educated groups ($P = 0.004$) (Gholamreza *et al.*, 2010). Megeressa *et al.*, (2013) 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 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 to Megerssa et al. (2013) 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. This variation might be due to differences in socio-economic status and overall lifestyle of the patients studied i.e. DM affects people with illiterates, primary school and those with sedentary activity among others.

In the present study the age group DM patients were more numbers between 15 to 19 age group (46.04%) followed by more than 40 age (42.37 %) and less than 15 age (11.5%). The age group most affected by the ailment was the 51 - 60 years, with the mean age of presentation of 51.5 years and the modal age of 54.2 years while the median age at presentation was 50.3 years. There was a higher prevalence in males 1056 (52.1%) than in females 972 (47.9%) (Prosper, 2015).

In the current study, out of the 320 diabetic patients 37 (11.56 %) had type I DM and 283(88.44 %) had type II DM. This study was supported by (Yeromnesh et al., 2015) found that out of the total 263 diabetic patients, 47(18%) had type 1 DM and 216 (82%) had type 2 DM. This study was supported, the prevalence of type 2 diabetes mellitus is probably higher than that of type 1 diabetes (Prosper et al., 2015), World health organization (WHO) estimated that in 2000, the prevalence of diabetes in African Region was 7.02 million people, out of which about 0.702 million (10%) people had type 1 diabetes and 6.318 million (90%) had type 2 diabetes (Rhys Williams *et al.*, 2011). Diabetes type II diseases were highly predominated diseases across the year than Diabetes type I from 2011-2014 at Dilla Referral Hospital (Fekadu alemu, 2015).

Similar finding from Gondar University Teaching Referral Hospital had reporting by Abebe *et al.*, 2013, 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. The reason behind the rise in prevalence of DM with type 2 may be due to a change in feeding and overall lifestyle emanating from increasing urbanization and economic development in the region.

CONCLUSIONS

Diabetes mellitus is a chronic illness that is commoner in people aged 40 years and above. Its prevalence is rapidly on the rise as a result of urbanization, westernized diet, sedentary lifestyle, obesity and genetic predisposition. Diabetic patients were increased across the year 2015-2017 at Robe Hospital. Therefore, this finding calls attention to the urgent need for monitoring diabetes mellitus disease in order to facilitate timely preventive and curative interventions.

RECOMMENDATION

- 1) Health workers should be educated enough to pass the right information to the public concerning the pattern of presentation of diabetes mellitus. This will enhance early detection and management.
- 2) People should be taught about the modifiable risk factors of the ailment such as obesity, sedentary lifestyle, alcoholism and smoking, and then encouraged to adopt healthy life style to prevent the onset of the disease and the development of chronic complications.
- 3) Government and other stake-holders should demonstrate enough political will and commitment by increased funding, capacity building and provision of necessary materials and equipment at the primary health care level, for early detection and treatment. Where complications and co-morbidities occur, integrated diabetes management approach should be adopted to prevent death and improve the quality of life of the diabetic patient.

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