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Glycemic Control and Self-Care Practice among Ambulatory Diabetic Patients in Ambo General Hospital, West Showa, Ethiopia

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Strictly as per the compliance and regulations of:

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Results: The study showed that 58.5% of the respondents had type 1 diabetes and the remaining 41.5% were type2 DM. Mean FBS of three consecutive month was183.28 mg/dL. Only23.4%, 34.2% and 28.8% of the respondents were able to control their Fasting Blood Sugar (FBS) to level below 126 mg/dL during their last first, second and third visit to the hospital. 20(18.01%) of the respondents do exercise daily and attend their follow up program as scheduled respectively.

Conclusion: The present study illustrates that the level of knowledge about diabetes and self care practices amongst diabetic patients was low. In addition, it showed that respondents' level of physical activity, their educational status and time of insulin injection was low. Type 1 DM is the most prevalent type identified during the study period. In general, self-care practice was inadequate, especially in terms of physical self-care activity and a deficit in terms of knowledge related to diabetes; this could be explained by factors such as limited education and low levels of economic status

Recommendation: Health care providers should educate and promote health to address the lack of information on a healthy diet, benefits of exercise and how exercise should be undertaken for ambulatory DM patients when they come for regular follow up regularly at the hospital. Primary care physician must interpret (preferably in patient's language), for each diabetic patient, the short and long-term benefits of adhering to diet and exercise recommendations, insulin storage site in the hospital as well as at home must be given special emphasis.

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I. Introduction

a) Background

Diabetes mellitus is not a single disease entity but rather a group of metabolic disorders sharing the common underlying feature of hyperglycemia. Hyperglycemia in diabetes results from defects in insulin secretion, insulin action, or, most commonly, both. The chronic hyperglycemia and attendant metabolic dysregulation of diabetes mellitus may be associated with secondary damage in multiple organ systems, especially the kidneys, eyes, nerves, and blood vessels. It also greatly increases the risk of developing coronary artery disease and cerebrovascular disease. In concert with great technologic advances, there have been pronounced changes in human behavior, with increasingly sedentary life styles and poor eating habits. This has contributed to the simultaneous escalation of diabetes and obesity worldwide, which some have termed the "diabesity" epidemic. (6)

Prevalence of both type 1 and type 2 DM is increasing worldwide, type 2 DM is rising much more rapidly, presumably because of increasing obesity, reduced activity levels as countries become more industrialized, and the aging of the population [1].

According to IDF diabetes Atlas, 5th edition 2012 report, currently, more than 80% of people with diabetes live in low and middle income countries. The African region is expected to experience the highest increase in coming years withestimated increase in prevalence rates of 98% for sub-Saharan Africa, and 94% for North Africa and the Middle East (10, 11, 12, 13).It also said regional prevalence of 3.8%. This would rise to 4.3% 2030.Based on the IDF Atlas 5th edition, 2012 report, number of cases of diabetes in Ethiopia to be estimated about 1.4 million in 2011 (7, 8).

The diagnosis involves evaluation of blood glucose levels which are normally maintained in a very narrow range; usually 70 to 120 mg/dl that is established by elevation of blood glucose by any one of the following three criteria (1, 3)

A random blood glucose concentration of 200 mg/dL or higher, with classical signs and symptoms; A fasting glucose concentration of 126 mg/dL or higher on more than one occasion, or; An abnormal oral glucose tolerance test (OGTT), in which the glucose concentration is 200 mg/dL or higher 2 hours after a standard carbohydrate load (75 gm of glucose). (2)

b) Statement Of The Problem

DM is a life-long challenge that requires behavioral change and adequate self-care practices for better glycemic control. In the absence of appropriate self-care practice, the desired therapy targets are difficult, or even impossible, to achieve.

Thus, the aim of the present study was to assess self-care practices and glycemic control among diabetes patients in Ambo general hospital.

Non- communicable diseases including diabetes account for 60% of all deaths worldwide andmore than 80% of diabetes deaths occur in low- and middle-income countries. According to IDF Atlas 5th edition2012 report, Diabetes caused 4.6 million deaths in 2011 globally. World Health Organization projects that diabetesdeaths will double between 2005 and 2030. Statistics for medical complications from diabetes are also concerning. Proportions of patients with diabetic complications in sub Saharan region ranged from 7-63% for retinopathy, 27-66%for neuropathy and 10-83% for nephropathy. Diabetes is likely to increase the risk of several important infections inthe region, including tuberculosis, pneumonia and sepsis (14).Diabetes being a chronic illness requires continuous self-management practices bysufferers so that they can contribute meaningfully in the management of their lives. A situation where diabetes patients visit clinics regularly and their blood glucose levels still remain high despite the treatment they receive is problem that calls for attention. This is a very common observation in many diabetes patients. Severe complications, like gangrene that may lead to amputation and possible premature death, this might be because of lack of appropriate self-management practices (4).

Despite the benefits of engaging in a recommended self-management practice, research remains limited on determining recommended self-care practices level and its associated factors among diabetes patients. Researchers have suggested that self-care activities vary extensively according to the nature of the activity itself, with taking of medication often occurring as recommended and exercise frequently falling below recommended levels. For example, results from one study showed that 97% of respondents' with diabetes always or usually took their medication, whereas only 41% always or usually exercised, as cited by NancyE. Schoenberg (14). Furthermore, we currently lack an in-depth understanding of level and associated factors of type2 diabetes patients to ward diabetes self-care practices.

Although all forms of diabetes mellitus share hyperglycemia as a common feature, the underlying causes of hyperglycemia vary widely. The vast majority of cases of diabetes fall into one of two broad classes: (1)

Type1diabetes is characterized by an absolute deficiency of insulin secretion caused by pancreatic β-cell destruction, usually resulting from an autoimmune attack. It accounts for approximately 10% of all cases (5).

c) Significance Of The Study

The major problematic condition about diabetes self-care practices is that there is limited research findings on diabetic patients in our country, even there is no enough published material and little research is done on this areas. To address these deficits, this research explores for diabetes self-management practices. So the findings of this research can help diabetic patients to know how to control their sugar level and improve their self-care practice. Based on the findings of the research, patients of DM at Ambo hospital will be advised to strengthen those positive practices and will also be advised to practice appropriately by discouraging improper practices. The study can also serve as starting material for those who want to undertake further research on this area.

II. Objectives of The Study

a) General Objectives

- The aim of this study was to assess factors prevalence of glycemic control and self-management practices among ambulatory diabetic patients in Ambo general Hospital

b) Specific Objectives

- To determine prevalence of poor glycemic control.
- To assess dietary self-care practices among diabetic patients at Ambo General Hospital.
- To assess the physical activity and foot care practices among diabetic patients at Ambo
- General hospital.
- To assess blood glucose monitoring practice among the diabetic patients within three months.

III. Methods and Participants

a) Study area and period

This study was conducted in Ambo General Hospital, which is found in Ambo town, west showa, Ethiopia. Ambo has a total population of 260, 193 of whom 131, 922 are men. It is located in the west Showa zone of the Oromia region, 114 km West of Addis Ababa, the town has a latitude and longitude of 8.983O N 37.850O E and an elevation of 2101m. The town has an annual rain fall of 1012 mm with 18 CO average temperatures. The Hospital is found in 01 kebele of Ambo town near West Shewa zone prison House. The hospital give serves for about 10,000 People. The study was conducted from February 1/2014 to .May/2014

b) Study design

Cross-sectional study was conducted from 01 February to May 30, 2014.

c) Source population

Source population includes all diabetes patients that attend their follow up schedule in Ambo general hospital.

d) Study population

Study population includes all diabetes patients that follow their diseases status in Ambo general Hospital for the last three months.

e) Sampling size Determination

All DM patients who came to Ambo general hospital for follow up during data collection period were considered to be included in the sample. Accordingly 111 patients fulfilled the inclusion criteria and were included in the study. Six of the patients that didn't fulfilled the inclusion criteria were excluded from the study.

f) Inclusion and exclusion criteria

i. *Inclusion criteria*

Patient that has been part of a follow-up program for at least three follow at Ambo General Hospital was included in the study.

ii. *Exclusion criteria*

Patients with mental health problems, hearing impairments or any other serious health problems and those patients who were unable to provide the appropriate information were excluded.

g) Study Variables

i. *Dependent variables*

Self-care practice among diabetic patients, glycemic control

ii. *Independent variables*

Socio demographic characteristics of study population

h) Data collection procedure and Instrument

Patients were interviewed using structured questionnaires and check lists was used to gain information from their card. The data collection was conducted by the joint collaboration of the investigator, nurses and health care professionals that are involved in delivery of care to the specified patients in the hospital by orienting them on how to collect the data. Questionnaires were prepared in English and translated into Amharic and Afan Oromo (local languages) and translated back into English to check its consistency. To identify the patterns of glycemic control, patients' charts was reviewed, retrospectively; the last three successive FBS or RBS results was recorded from the patient's card.

i) Data quality control

Pretest was done in 10 patients at Ambo Hospital to assure validity of the check list and questionnaire. Language experts who were qualified with second degree with linguistic and are Ambo University stuff members were used to translate the questionnaires from English to Amharic and Afan Oromo version. The questionnaires were revised for its completeness and consistency.

j) Data analysis

The data was cleaned, coded, entered and analyzed using SPSS version 20. Categorical variables were described by frequencies and percentages, and continuous variables were described by means and standard deviations. Figures and tables were used to summarize the results.

k) Ethical consideration

Formal letter was obtained from Research Ethics Committee of Ambo University and submitted to Ambo General Hospital, so the letter was given to the hospitals and they allowed us to do the research. Verbal consent was taken from the patient.

l) Operational definition

The level of glycemic control was indicated as 'adequate glycemic control' when FBS results were less than 126 mg/dL (7 mm/L) (i.e. an average of three visits), or when RBS results were less than 200/dL; 'inadequate glycemic control' takes place when a parameter is beyond the criteria of adequate glycemic.

i. *Knowledge*

Knowledge of patients' relating to diabetes and self-care practice was assessed by making use of 'yes/no' questions. A correct answer will be coded as '1' and an incorrect answer as '0'; the score is then computed. Respondents are labeled as having knowledge of diabetes and self-care practices if he or she scored ≥ the mean value, and having poor knowledge if he or she scored less than the mean.

ii. *Physical activity*

The levels of physical activity of the patients were classified into three levels based on their physical activities as light, moderate and heavy.

1. Light activity: Patients are in a sitting position most of the time, less than half of the time they are standing or walking, they seldom carry heavy things, and travel by car or motorbike.
2. Moderate activity: Patients are sitting, standing and walking about half of their time. They spend some time carrying heavy things and use public transport during non-leisure hours.
3. Heavy activity: Patients spend almost none of their time sitting and almost all of their time standing or walking, most of the time carrying heavy things, and they use public transport, cycle or walk everywhere.

Self-care

Self-care means looking after yourself in health way. This includes changes to your diet, different types

of exercise or different types of medication you may need to make.

m) Limitations of the study

The findings from this situational analysis may not be generalized to the total population because of the lower sample size than the expected.

IV. Results

a) Socio-demographic characteristics of the participants

A total of 111diabetic patients were participated in the study giving a response rate of 100%. From total respondents 63 (56.75%) were male, regarding the age of participants, 33 (29.7%) of them were younger than 30 years of age and the remaining 78 respondents (70.27%) were above age of 30. Most of them completed grade 7-12 and 29 patients had monthly income of 500-800 birr.

Table 1 : socio-demographic characteristic of the patients in ambulatory diabetic patients

Characteristic type	Characteristic	Frequency (%)
Sex	Male	63(56.75)
	Female	48(43.25)
Age	1-29	33(29.7)
	30-44	31(27.9)
	45-64	37(33.3)
	Above 65	10(9)
Marital status	Single	42(37.8)
	Married	65(58.5)
	Widowed	4(3.3)
Religion	Orthodox	64(57.6)
	Muslim	8(7.2)
	Protestant	37(33.3)
	Others	2(1.8)
Ethnicity	Oromo	96(86.7)
	Amhara	14(12.6)
	Tigre	1(0.9)
Occupation	Farmer	38(34.2)
	Merchant	20(18)
	Civil servant	28(25.2)
	Others	25(22.5_)
Education level	Illiterate & non formal edu.	18(16.2)
	Grade 1-6	26(23.4)
	Grade 7-12	44(39.6)
	Above grade 12	23(20.7)
Income	<500	51(45.9)
	500-800	29(26.1)
	801-1500	16(14.4)
	>1500	15(13.5)

b) Clinical characteristics of the patients

Regarding the clinical characteristics of the patients, from the total of 111 patients 65 of them were diagnosed for type 1 DM (58.5%) and the remaining 46 of them (41.5%) were type 2 DM.70.27% say no family member with DM and the rest 29.73% say there is a family member with DM. Concerning the presence of other co morbidities 17. 11% have hypertension and 6.3% of the patients have CKD. When we look their respective drug use, 35 patients which contribute 31.53% use glabinclamide, 22 patients which contribute about19.81% use metformin, 6 patients which contribute 5.1% use both insulin & metformin, and 65 patients which contribute about 58.55% use insulin. Out of the 65 insulin users, 10 patients (15.38%) use refrigerator, 55(84.61%) use home prepared cool sites.

Of the patients who were using insulin, only 23 (20.7%) took meals 30 minutes after each insulin injection, and the remaining patients were used to eat before injection while 70.2% took meals after one hour of taking an injection. The majority of the respondents (104, 93.7%) follow their medication strictly to avoid

raise in blood sugar level. From the total respondents, 96 of them (86.5%) attend their follow up program as per the schedule.10.8% patients have habit of alcohol or smoking and the remaining 99 respondents (89.2%) do not have any habit.

Means of communication was assessed to know how diabetic patients can obtain information or education from Medias and from newspapers as well as to know whether they have phone in case they face emergency conditions(hypoglycemia or hyperglycemia) to obtain health services. The results shows the majority of the patients have access to radio, TV and phone services and 91 respondents (82%) do not have the chance to get newspapers.

Table 2 : clinical characteristics of the patients

Variables	*Frequency (%)*
Type of DM	
Type1 DM	65(58.55)
Type 2 DM	46(41.44)
Time since DM d	
<2000	6(5.4)
2000-2002	33(29.7)]
2003-2006	72(64.89)
Hx of DM in the family	
Yes	33(29.73)
No	78(70.27)
Co morbidities	
CKD	7(6.3)
HTN	19(17.11)
CHF	1(0.9)
Stroke	0(0)
Others	13(11.71)
Pattern of drugs for DM	
Insulin	65(58.55)
Oral hypoglycemic agents	
Metformin	22(19.81)
Glabineclamide	35(31.53)
Insulin &metformin	6(5.4)
Source of information for DM	
Radio Yes	83(74.8)
No	28(25.2)
TV Yes	60(54)
No	51(46)
Phone Yes	58(52.2)
No	53(47.8)
Newspaper yes	20(18)
No	91(82)

c) Knowledge about diabetes

Participants were asked whether DM is a chronic disease or a curable disease and whether it is possible to control it by interventions, such as a healthy diet, exercise, and administering insulin and hypoglycemic drugs. Accordingly, 72 respondents (64.86%) responded that it is chronic disease 39 respondents (35.14%) said that DM is curable and 96respondents (86.48%) reported that it is possible to control diabetes. Furthermore, the majority (83.78%) of the respondents knows the sign and symptoms of DM and the remaining (16.22%) do not know the signs and symptoms of DM.

d) Self- care practice

i. *Dietary self -care practice*

Concerning to food items that they consume to control their sugar level, the majority of the respondents answered that injera (i.e. a stable food diet in Ethiopia made of Teff cereal), barely and kocho (i.e. a traditional staple food made of a false banana plant called enset or Ensete Scitamineae) have a low glycemic index and could be eaten freely by diabetic patients; Only 74 respondents (66.7%) stated that fibrous food (e.g.whole grain cereals) has a high glycemic index and similarly 29 respondents (26.1%) do not know the sign and symptoms of hypoglycemia.From those who know the sign and symptoms of hypoglycemia, 50% uses candy to control their sugar, 46% uses table sugar and the remaining uses soft drinks. 59.5% have regular time for meal whereas the remaining 41.5% do not have regular meal time. The majority of the respondents (103, 92.8%) eat three times per day.

Table 3 : Type of food consumed by diabetic patients

Type of food they consume *Frequency (%)*	
Type of food they consume	**Frequency (%)**
Injera (teff)	79(71.17)
Barely	73(65.76)
Kocho	13(11.71)
Others	17(15.31)
Food they take during hypoglycemia	
Table sugar	51(46)
Candy	55(49.54)
Soft drink	31(27.92)
Others	11(9.9)

ii. *Physical activity self- care practice*

The physical activity that the respondent performs was summarized in the table 4 below. Accordingly, 49.54%practice hard work such as farming, daily laborer, 21.62% perform aerobic exercise, and the rest 23.42%were involved other activities. Most of the respondents, 45.05% do physical exercise sometimes whereas 18.01% do exercise daily and the rest 36.94% never do physical exercise. With regard to practice of walking, 91 respondents (81.98%) do walk and the rest 20 respondents (18.02%) do not practice walking. 95.49 %) of patients has shoe wearing practice whereas the rest 5 do not. There is 110 (99.09 %) daily and 1(0.91%) twice a week foot washing practice among the respondents. Of the total respondents 99 (89.19%) have not sustained foot injury. Of those sustained foot injury 9get health care's and the rest 3get to traditional healers for support.

Table 4 : Physical activity self-care among DM patients of Ambo general Hospital, WestShoa, Ethiopia April –May 2004

Question	Response	Number of respondents (%)
1 What type of physical activity do you practice for your health	Hard work	55(49.54
	Aerobic exercise	24(21.62)
	Swimming	4(3.60)
	Driving bicycle	2(1.80)
	Others	26(23.42)
2 How often do you perform physical exercise	Daily	20(18.01)
	Sometimes	50(45.05)
	Never	41(36.94)
3 Practice of Walking on foot	Yes	91(81.98)
	No	20(18.02)
5 Do you wear shoe for your foot care	Yes	106(95.49)
	No	5(4.51)
6 How often do you wash your feet	Daily	110(99.09)
	Twice a week	1(0.91)
	Weekly	0(0.00)
	Do not wash	0(0.00)
7 Sustaining of foot injury	Yes	12(10.81)
	No	99(89.19)
8Actions taken in case of foot injury	Get health care	9(8.3)
	traditional healers	3(2.7)
	Heal spontaneously	0(0.00)

iii. *Self-Blood glucose monitoring, medication self-care, and Foot care practice*

There were 102 patients practicing blood glucose monitoring at home. 79.27% of the respondents do not forget to use their medication, whereas 98(88.28%) do not miss their medication intentionally. Most patients (106, 95.49%) do not interrupt their medication due to side effect or when feeling free of the disease but the rest 4.51 % (5 patients) interrupt their medication due to side effect or when feeling free of the disease. 99 of the respondents (89.19%) do not forget their medication while travelling but the rest 12(10.81%) do. With regard to the presence of health problem other than DM, 82 respondents (73.87%) say no and the rest 29 patients (26.13%) say yes. 78 patients(70.27%) say no family member with DM and the rest 33(29.73%) say there is a family member with DM.

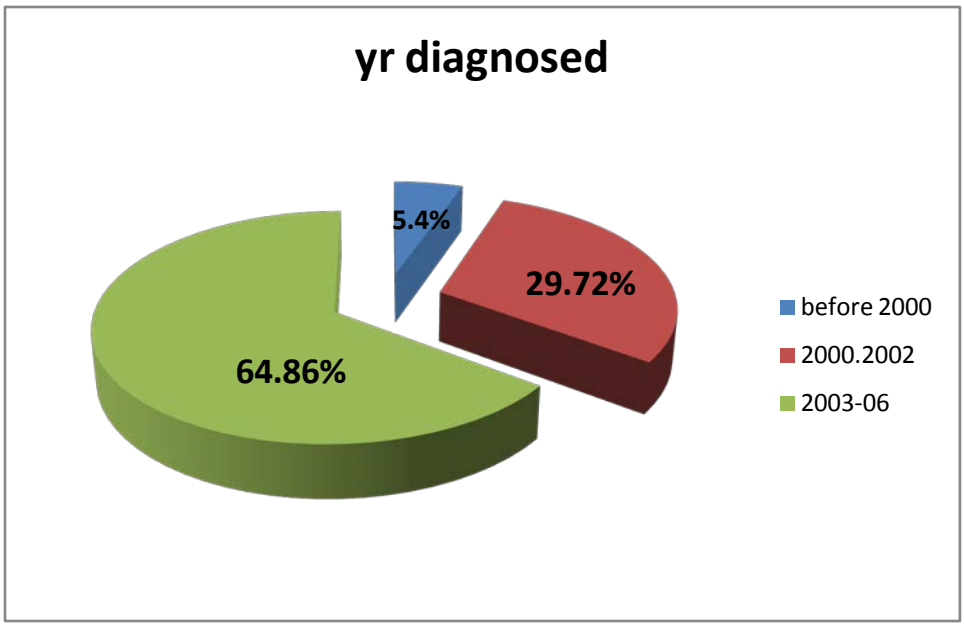
When we look their respective drug use, 35 patients which contribute 31.53% use glabinclamide, 22 patients which contribute about19.81% use metformin, 6 patients which contribute 5.1% use both insulin &metformin, and 63 patients which contribute about 56.76% use insulin. Out of the 69 insulin users, 10 patients (14.49%) use refrigerator, 53 patients (76.81%) use home prepared cool sites and 6 patients (8.70%) use other methods for storage of the drug at appropriate temperature.

Table 5 : Self- Blood glucose monitoring, medication self-care and Foot care practice among DM patients of Ambo general Hospital in West Shoa, Ethiopia April –May 2004

Question	Response	Number of respondents(%)
1-Blood glucose monitoring practice at home	Yes	9(8.11)
	No	102(91.89)
2-Forgetting medication use	Yes	23(20.73)
	No	88(79.27)
4- Medication missing for a reason other than forgetting	Yes	13(11.72)
	No	98(88.28)
6- Medication interruption due to side effect	Yes	5(4.51)
	No	106(95.49)
7- Forgetting medicine while traveling	Yes	12(10.81)
	No	99(89.19)
8-Interruption of medication when feeling free of the disease	Yes	5(4.51)
	No	106(95.49)

iv. *Glycemic control among respondents*

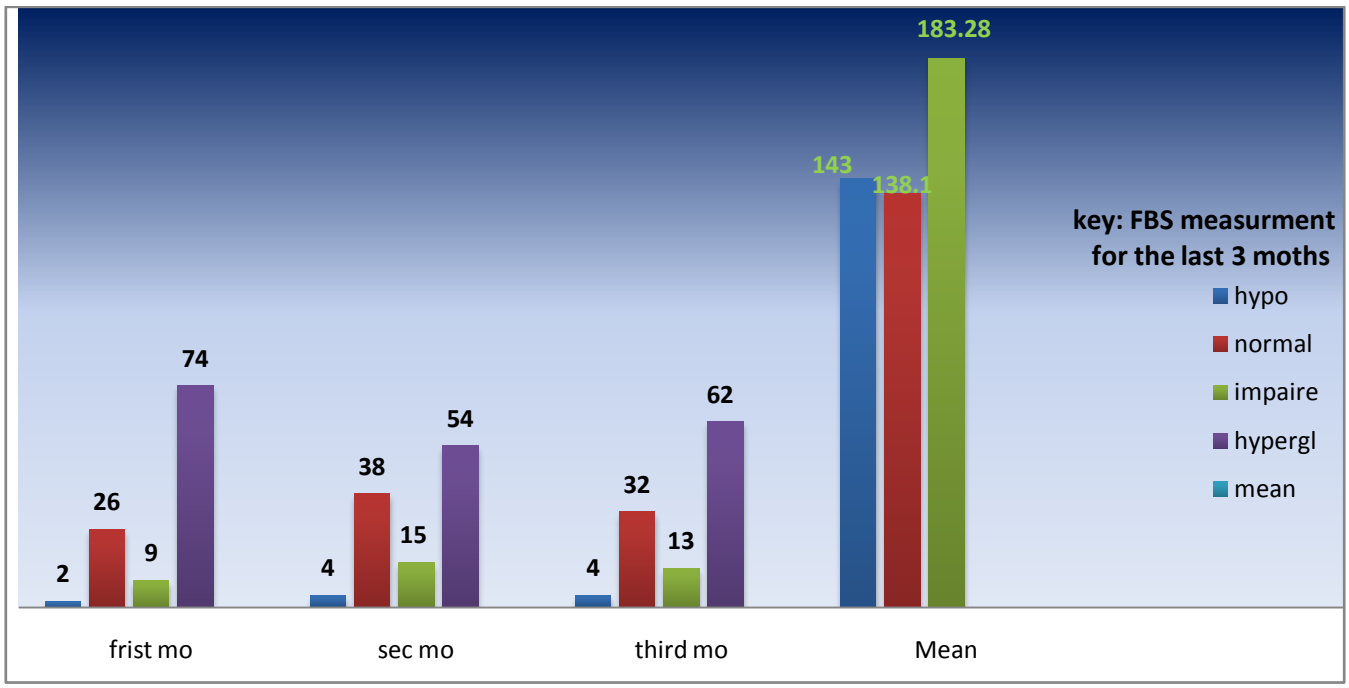
Check list was used to assess patients card to know their year of diagnosis, type of DM and their fasting blood sugar level for the last three months and the data obtained shows from the total of 111 patients 65 of them were diagnosed for type 1 DM (58.5%) and the remaining 46 of them (41.5%) were type 2 DM. Concerning the year of first diagnosis 72 of them (64.8%) were diagnosed after 2003, 33 of them (29.7%) were diagnosed from 2000-2002 and the remaining before 2000.



Figuer 1 : Year of first diagnosis of DM patients at Ambo General Hospital West Shoa, Ethiopia

To know the sugar level of the patients each patient's card was revised to obtain their FBS level during their last three visits to Ambo Hospital and the result obtained was presented in the chart below

The chart below shows that the mean FBS of the respondents during the last visit to the hospital was 183.28. Out of the total 111 patients who visited Ambo Hospital during the third month 62 of them (55.8%) were tested to have FBS level of above 126, 13 (11.7%) have IFG level,32(28.8%) of them maintained their normal blood sugar level and 4 patients fall in hypoglycemia. During their second visit 38 patients (34.2%) maintained the FBS level within the normal range and 54 of them (48.6%) were in hyperglycemia. Similarly the FBS of the patients during their first visit shows 74 of them (66.65%) were tested to have FBS of above 126, 9 of them (8.1%) impaired sugar level,26 of them(23.4%) maintained their normal FBS.



Figuer 2 : FBS measurements for the last three months at Ambo general hospital West Shoa, Ethiopia April –May 2004

V. Discussion

The present study attempted to assess diabetes mellitus Patients' knowledge and self-care practices in terms of living with the disease. According to the findings of the study, most of the respondents know that DM is chronic disease. But 35.14% of the respondents think DM is curable and 16.22% of the respondents even do not know the sign and symptoms of DM. This is in agreement with the study conducted in Jima University [9] in which 34.21% of the patients responded DM is curable. The majority of the respondents consume teff, barely and kocho which they think have low glycemic index and could be eaten freely by diabetic patients. Diabetes self-management behaviors such as diet and exercise involve and depend on guidance from a health care provider, meal preparation in a family context and exercising with a partner [1].

The study also shows physical activity level of the patients were sub optimal and 41(36.42%) respondents never do any physical activity. This is in line with the study conducted at JimmaUniversity [8] in which most of the respondents has sub optimal physical exercise which could be because of having inadequate knowledge in terms of the benefits of regular physical exercise and a fear of hypoglycemia. Exercise has multiple positive benefits including cardiovascular risk reduction, reduced blood pressure, maintenance of muscle mass, reduction in body fat, and weight loss. For individuals with type 1 or type 2 DM, exercise is also useful for lowering plasma glucose (during and following exercise) and increasing insulin sensitivity [1]. In patients with diabetes, the ADA recommends 150 min/week (distributed over at least 3 days) of moderate aerobic physical activity. The exercise regimen should also include resistance training.

The study also showed that the majority of the respondents 95.49% wear shoe and 99.09% of the respondents wash their foot daily which is very important to decrease the complications associated with the disease. DM is the leading cause of non-traumatic lower extremity amputation. Patient education should emphasize careful selection of footwear, daily inspection of the feet to detect early signs of poor-fitting

footwear or minor trauma, daily foot hygiene to keep the skin clean and moist, avoidance of self-treatment of foot abnormalities and high-risk behavior (e.g., walking barefoot), and prompt consultation with a health care provider if an abnormality arises (1).

Of the patients who were using insulin, only 23 (20.7%) took meals 30 minutes after each insulin injection, and the majority 70.2% of the patients were used to eat before injection. Regular insulin is given 30–45 min prior to a meal [1]. 6.3% of the respondents miss their medication and 13.5% do not attend their follow up as scheduled for them. More than half of the respondents 65(58.5%) were type 1 DM. Diabetes is managed via a regimen of control. Physicians advise adults living with type 2 diabetes to control blood sugar levels by controlling diet, maintaining regular exercise, and complying with medication. The extent to which individuals are able to adhere to such recommendations varies (5).

Regarding the FBS of the patients for the last three months the mean FBS of the last visit was found to be 183.28mg/dl which are far from the normal glucose homeostasis. Generally the results of their last three visit shows only, 32(28.8%) of them during the third month, 38 patients (34.2%) during the second month and 23.4% of them during the first visit maintained their sugar level within the normal range. This is consistent with other studies [10] who reported adequate glycemic control in 43.8% of type -2 diabetic patients. This indicates that most of the patients were not controlling their blood glucose level, despite most of them taking medication provided for them. Despite the increasing prevalence of diabetes, improved understanding of the disease, and a variety of new medications, glycemic control does not appear to be improving. Self-monitoring of blood glucose (SMBG) is one strategy for improving glycemic control; however, patient's adherence is suboptimal and a proper education and follow-up are crucial. SMBG should include post-prandial monitoring to identify glycemic excursions after meals, to indicate the need for lifestyle adjustments, and to provide patients' feedback on dietary choices (12).

Discussing the adequacy of glycemic control will be a handicap without mentioning glycosylated hemoglobin (HbAlc) determination; the ADA recommends that a patient should have glycosylated hemoglobin determination at least twice yearly. In addition, a study conducted in the United States of America (USA) showed that at least 77% of diabetic patients had at least one glycosylated hemoglobin determination in the two years preceding the study. However, none of the patients had glycosylated hemoglobin. Our findings, therefore, suggest that monitoring of glycemic control among DM patients at Ambo Hospital west Shoa Ethiopia may be less than optimal and this may be a probable contributory factor to late detection of patients at risk of complications and death from poorly controlled diabetes.

To know and follow self care practices anthropometric measurements are also important parameters for diabetic patents. But none of them have anthropometric measurement data.

Self-care activity in diabetic management includes medication self-care, dietary self-care, physical activity self-care and self-monitoring of blood glucose levels.

VI. Conclusion and Recommendation

a) Conclusion

In general, self-care practice was inadequate, especially in terms of physical self-care activity and a deficit in terms of knowledge related to diabetes. In some cases the patients do not attend their follow up strictly and sometimes miss taking their medications. Almost all the patients have good foot care hygiene. Regarding insulin injection time with respect to meal, majority of them take their medication after eating. The mean fasting blood sugar of the patients during the last visit was not controlled.

b) Reccomandations

The following recommendations are forwarded.

Health care providers: should educate and promote health to address the lack of information on a healthy diet, benefits of exercise and how exercise should be undertaken for ambulatory DM patients when they come for regular follow up regularly at the hospital

Primary care physician must interpret (preferably in patient's language), for each diabetic patient, the short and long-term benefits of adhering to diet and exercise recommendations, Insulin storage site in the hospital as well as at home must be given special emphasis.

Patients should learn to follow their medication strictly including the site of injection care for their diet with regular meal time and understand the benefit of physical exercise.

The hospital follow up schedule must not be longer than one month and patients must adapt to frequently visit the hospital for regular checkup. Patients can learn to control their blood sugar level at home by using glucometer.

Generally self -care practice including blood glucose monitoring is the back bone to control DM, hence further investigation by researchers is needed to strengthen diabetic self-care practice and promote health.

VII. List of Abbreviations

ADA = American Diabetic Association

ATP = Adenosine Triphosphate

DM = Diabetes Mellitus

DNA = DeoxyriboNucleic Acid

FBS = Fasting Blood Sugar

HbA1c = Glycosylated Hemoglobin

OGTT = Oral Glucose Tolerance Test

RBS = Random Blood Sugar

IFG = Impaired fasting glucose

CKD = Chronic kidney disease

CHF = Congestive heart failure

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