ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

ASSESSMENT OF DIABETES SELF-CARE PRACTICE AND ITS ASSOCIATED FACTORS AMONG PATIENT ON FOLLOW UP AT PUBLIC AND PRIVATE PRIMARY LEVEL HEALTH CARE IN ADDIS ABABA, ETHIOPIA

BY: BERHAN TASSEW (BSc)

A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS IN PUBLIC HEALTH

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Addis Ababa, Ethiopia

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LIST OF ABBREVIATIONS

AARHB - Addis Ababa Regional Health Bureau

DM - Diabetes Mellitus

FBS – Fasting Blood Glucose

FMOH- Federal Ministry of Health

HBM – Health Belief Model

IDF - International Diabetic's Federation

NCD - Non Communicable Disease

SMBG- Self Monitoring of Blood Glucose

US - United States

WHO - World Health Organization

DTSQ – Diabetes Treatment Satisfaction Questionnaire

ABSRTRACT

Background: Diabetes mellitus is as one of the rapidly increasing non communicable diseases requiring continuous medical care and mainly life time patient self-care practice to prevent acute and chronic complications. Various factors influence one's ability to perform diabetes self-care and these factors are not typically stable for all patients. Despite the importance of identifying these factors for health care providers to individualize clinical approaches, as to the current knowledge of the investigator there is no comprehensive assessment and documentation in Ethiopia particularly at primary health care level where these are closer to the people and first line contact point to the patients.

Objective: To assess the magnitude of self-care practice and associated factors among diabetic patients who are on follow up at primary level health care (health centers and private clinics) in Addis Ababa, Ethiopia

Methods: Facility based, cross-sectional study design was conducted from February to March 2015.A total of 595diabetic patients were selected by systematic random sampling method from both public health centers and private clinics in Addis Ababa. Data was collected based on interview administered method using pre tested structured questioner. Descriptive analysis was done and level of diabetic self- care practice was determined based on the mean value among the self -care practice questions asked. Bivariate and multivariate logistic regression was done to identify factors that were associated with diabetic self -care practice. The odds ratio with 95% CI was used to determine the association. A statistical significance was declared at p value <0.05.

Result: Among 595 respondents about 311(52.3%) had good diabetic self-care practice. The mean (SD) age of the respondents was 53.5(14) and 343(57.6%) were male. The presence of co-morbidities (AOR=1.68, 95%CI; 1.07-2.65), having glucometer at home (AOR=2.01, 95%CI; 1.19-3.38), diabetic association membership (AOR = 3.02, 95%CI; 1.30-7.04), follow up in private clinics (AOR=3.05, 95%CI; 1.55-5.97), treatment satisfaction (AOR =1.69, 95%CI; 1.08-2.59) were significantly associated with good self-care practice.

Conclusion: The study demonstrated almost half of the patients 52.3% had good diabetic self-care practice but still substantial number 47.7% of respondent had poor self-care. Good self-care was associated with having glucometer at home, diabetic association membership, attending follow-up in private clinics, treatment satisfaction. Advocating and empowering patients regarding the importance of diabetic self-care practice is highly recommended.

1. INTRODUCTION

1.1 Background

Diabetes mellitus(DM) is a clinical syndrome characterized by hyperglycemia due to absolute or relative deficiency of insulin (1).the American diabetes Association(ADA) clinically categorized DM as Type I diabetes, Type II diabetes, Gestational diabetes mellitus and other specific types of diabetes due to other causes such as genetic defects in b-cell function, genetic defects in insulin action, diseases of the exocrine pancreas (2). According to the 6th edition of the international diabetes federation(IDF) Diabetes Atlas 2013, there are an estimated 382 million people with diabetes and the number of people to rise beyond 592 million in less than 25 years worldwide if uncontrolled (3).

Even though the number of people who develop type I diabetes is increasing but most common and rapidly expanding is type II diabetes which is associated with economic development, aging population, dietary changes, reduced physical activity and increasing urbanization resulting change in lifestyle pattern. According to the regional IDF report in Africa, the prevalence of type I diabetes is 6.4million while type II diabetes was19.8million (4, 5).

Diabetes has acute as well as chronic complications, which are responsible for the majority of morbidity and mortality associated with the disease, therefore requires continuing medical care and ongoing patient self-management education and support to prevent acute complications and to reduce the risk of long-term complications(6, 7).

Diabetes self-care practices are undertaken by people with or at risk of developing diabetes in order to successfully delay the onset and manage the disease by their own, it includes healthy eating habits , being physically active, regular monitoring of blood glucose and blood pressure level, taking medication properly and reducing other potential risks which leads to the development of diabetes complications (8). Generally, it accounts for about 95% of all diabetes management since most people with diabetes may only have contact with a healthcare professionals for a total of a few hours per year, the rest of the time they care and manage their diabetes by themselves (9).

1.2 Statement of the problem

The cost of treatment and death of diabetes arise mainly from its complications, such as heart diseases, stroke, amputations and kidney failure and serious infections. These can be prevented or long-delayed by inexpensive, patent self-care practice by monitoring their blood sugar, blood pressure level, quit smoking and alcohol and practice that reduces bad cholesterol and by adopting a healthy diet and exercise (10, 11).

In higher income countries, the cost for medical care of diabetes contributes for more than 80% of their expenditures globally. Less than 20% of all expenditures for medical care are made in the middle- and low-income countries where 80% of people with diabetes will soon live (12).Particularly, health care in sub-Saharan Africa is epidemiologically known with high burden of communicable diseases and the face of scarcity of financial and human resources, diabetes presents an additional challenge by accounting for the 76% of deaths in people under the age of 60 annually (4, 11).

Even though Ethiopia is third among the top 5 countries in Africa by prevalence diabetes with an estimated 1.8 million people, the cost for diabetes medical care does not meet the expenses incurred during outpatient and inpatient care delivery services by the fast increment in the incidences and complications. This situation also contributes for the service does not fulfill the required standard(4, 13, 14).However ,through good self-practice, people with diabetes can delay the onset and reduce the development of complication that leads to a prolonged hospital admission and reduces their quality of life (15).

In line with the increasing prevalence of non-communicable disease especially diabetes, WHO encourages low and middle income countries to take on and provide support for the adoption of effective measures for the surveillance, develop a mechanism for the prevention and control of diabetes and its complications, through a primary health care approach(16).Several institution based studies conducted in different regions of Ethiopia including Addis Ababa repeatedly indicated the diabetes self-care practice was below the overall mean value(17-20).Most of the available literatures in Ethiopia were from tertiary hospitals where their service is relatively better organized. There is no such study that tries assessing diabetes self-care in primary health level care both in the private clinics and public health facilities located close to the people and

the meant to be the first point of entry to the health care system of the country. Hence the finding of the study provides and fills the information gap related with the level of self-care practice.

1.3 Rational of the study

Various specific personal and external factors influence one's ability to perform diabetes self-care and these factors are not typically stable for all patients. Identification of those parameters may help the health care system and the primary care physician to individualize clinical approaches toward improving diabetes self-care, glycemic and other outcomes according to the local context of the population is crucial to focus and address them directly, in order to improve patient satisfaction and possibly influence clinical outcomes (9, 15). Despite a number of articles on self-care management and related issues locally and internationally, some of the associated factors have not been well assessed.

Therefore, this study can assist in targeting public health efforts that improves patient self-care practice which accounts for more than the 95% of care that delay the onset and reduce diabetes complications. Knowing the level of the real self-care practice among diabetic patients at this level also helps the design and implementation of appropriate intervention and strategies that contributes for alleviating the burden in higher level/hospitals.

2 LITERATURE REVIEW

2.1 Diabetes Mellitus

Diabetes is the condition in which the body does not properly process food for use as energy, Type II diabetes which is the type of diabetes results from the body's ineffective use of insulin, accounting for about 90 to 95 percent of all diagnosed cases of diabetes.

Risk factors for include older age, obesity, and family history of diabetes, prior history of gestational diabetes, impaired glucose tolerance, physical inactivity, and race/ethnicity (21).

The treatments currently available are diet, insulin, and oral medication to lower blood glucose levels. Patient education and self-care practices are also important aspects of disease management that help people with diabetes lead normal lives(22).

2.2 Diabetes self-care practice

Self-care practice in diabetes is a critical factor to keep the disease under control and about 95% of the diseases management is usually carried out by the affected individual or their families. These practices include self-monitoring of blood glucose (SMBG), dietary modification, physical activity, and compliance to medication(23).Even though, compliance to self-care does not always lead to a total metabolic control, poor adherence to diabetic self-care practice is more likely to result in poor metabolic control (24).

According to the WHO 2010 to prevent type II diabetes and its complications, people should achieve and maintain healthy body weight, be physically active at least 30 minutes of regular, moderate-intensity activity on most days; early diagnosis can be accomplished through relatively inexpensive blood testing. Treatment of diabetes involves lowering blood sugar level and tobacco cessation is also important to avoid complications (16).The concepts of diabetes self-care practice not yet fully embraced in low-to-middle-income countries (3).

2.3 Prevalence of self-care practice

There is a variation in self-care practice in different part of the world, due to the presence and absence of risk factors. Diabetes control, achieved through diabetes care and management and

clinical preventive care practices, keeps people with diabetes healthy and can improve health outcomes (25).

A cross sectional study conducted on self-care practice in Mexico in 2007 to examines the self-care ability of type II DM and relates it to socio demographic and clinical variables on 251 patients indicates 83 (33.5%) individuals displayed good self-care ability and 168 (66.5%) individuals displayed regular ability (26). Another cross-sectional study to assess factors influencing self-care practice of patients in urban area of Uremia, Northwest of Iran in 2011 also found, out of the selected 400 patients in the health center self-care practice was good in 15.1%, moderate in 58.7%, and poor in 26.2% and most had inappropriate self-care practice especially in SMBG, which has critical role in controlling diabetes (27).However an institution based study conducted in Kenya on 1982 respondents ,only 813 (41%) demonstrated good practices towards diabetes which indicated poor practices of the community towards diabetes (28).

A cross sectional study conducted in 2013 in Nekemte Referral Hospitals, Ethiopia on 260 patients to assess self-care practices and its predictors among adults showed that 45% the respondents had poor diabetes self-care practice which is different from cross sectional study in Harari town, in 2011 from three different hospitals to identify predictors of self-care behaviors among 222 diabetic patients which showed 60.7% of the studied populations had poor self-care practices (19, 29).

2.4 Factors affecting self-care practice

2.4.1 Socio demographic factors

Age is associated with self-care practice according to a cross sectional study done in Brazil in 2010 (30), however a cross-sectional analysis of baseline measures from 185 African Americans with type 2 diabetes enrolled in a church-based randomized controlled trial in 2008 indicated elderly age /later life is a stage which predicts weak diabetes adopting /coping self-care (31).And according to a cross-sectional studies in Ethiopia Addis Ababa Tikur Anbessa specialized hospital indicated age is associated with self-care practice among other variables which is in line with a similar study in Felege Hiwot Hospital, Northwest Ethiopia in 2013 (17, 18).

Gender is a strong predictor of high self-care performance as the study done in Taiwan in 2007, male had statistically significant high self-care behavior than females (32) however a cross-

sectional study done in Uganda in 2010 on 340 respondents, women were adherent to recommended diet and more concerned with complications than men which is in line with the study conducted Addis Ababa Tikur Anbessa specialized hospital in 2012 (17, 33).

Income and educational level were among the strongly associated factors with self-management practice according to studies conducted in Taiwan in 2007 (32),Addis Ababa Tikur Anbessa Specialized Hospitals in 2012 (17), Felege Hiwot Hospital North west Ethiopia in 2012 (18) and the quantitative cross sectional study was conducted in 2011 in Harari town (29).

Social support or marital status(being married) contributed to better self -care practice according to a cross-sectional study done in Taiwan in 2007as well as the study in Nekemte Referral Hospital, Ethiopia on 260 diabetic patients (19, 32).

According to a study conducted in Pakistan, adherence to diabetic self-care practice was significantly higher in private consulting clinics than community health centers indicating diabetic self-care vary by place of treatment (34).

2.4.2 Clinical characteristics

Duration of diabetes diagnosis is a strong predictor in self-care activities according to the study in Taiwan 2007 (32). However the study in Brazil found no significance association (35) ,in line with the study done in Addis Ababa , but study done in Felege Hiwot Hospital North west Ethiopia found significant association between duration of diabetes as well as diabetic association membership (17, 18). Treatment intensity was significantly associated with self-care practice according to a cross-sectional study in urban area of Uremia, Northwest of Iran in 2010 (27).

Another challenge of DM is the development of comorbid conditions such as hypertension, cardiovascular diseases. Persons with comorbid chronic diseases experience a wide range of barriers to self-care, according to the study done in Pennsylvania State University Diabetes Database, however according to the study in North West Iran in 2010 there was no significant association which may be due to the difference in the study design but study in Addis Ababa found significant association (17, 27, 36).

2.4.3 **Knowledge on diabetes**

According to a cross-sectional study conducted in India, Nigeria, Kenya, as well as in Ethiopia Nekemte Referral hospital diabetic knowledge had significant association with self-care practice among other factors (19, 28, 37, 38).

The source of information for the knowledge also affects the self-management practice according to cross sectional study conducted in Qatar that indicated information on diabetes was mostly obtained from health care workers (69%) followed by friends and relatives (16%) and 15% of respondents received information from media such as newspaper, television, radio, books, magazines and internet. Whereas the study in Nigeria, majority stated that they did not receive any organized education/counseling on diabetes; rather, the health care providers were regimentally prescribing appropriate nutritional and pharmacological treatment for them (38, 39).

2.4.4 **Treatment Satisfaction**

Treatment satisfaction is important indicator of quality of care, which is the process component and independently associated demographic parameters (female gender), treatment factors (type of medication) difficulty attending follow-up or taking medications with according to a study (40).

2.4.**5 Diabetic health belief**

According to the HBM, people with diabetes will adhere to treatment plans if they are concerned about their health and believe that they are susceptible to problems, believe that diabetes could have serious consequences, believe that following medical recommendations will reduce threats, and believe that the benefits outweigh the costs of not adhering (41).

A study conducted in Nigeria indicated significant positive relationship between perceived severity, perceived benefits, and diabetes management (42). A study in Harari, Eastern Ethiopia on 222 respondents also indicated large proportion of them had moderate perceived susceptibility 174(78.4%) and severity 112(50.5%). More than half of the respondents 149(67.1%) had less perceived barrier to self-care practice. Only 87(39.2%)followed the recommended self-care practices on diabetes (29).

2.3 Conceptual Frame Work

There is a complex set of interactions between diabetes self-care practices and the associated factors. From all the discussion the interdependency of multiple factors contributes the low the prevalence of self- management practice among diabetic patients. From the factors that affect self-care practices are socio demographic/economic factors including age, gender, educational status ,occupation , social support and income and the clinical characteristics which affecting include type of diabetes, duration of illness, treatment intensity , family history ,diabetic education ,membership of diabetic association and comorbidity glycemic control and place of follow-up .Diabetes knowledge, treatment satisfaction and diabetic health belief as well affect diabetic self-care practice.

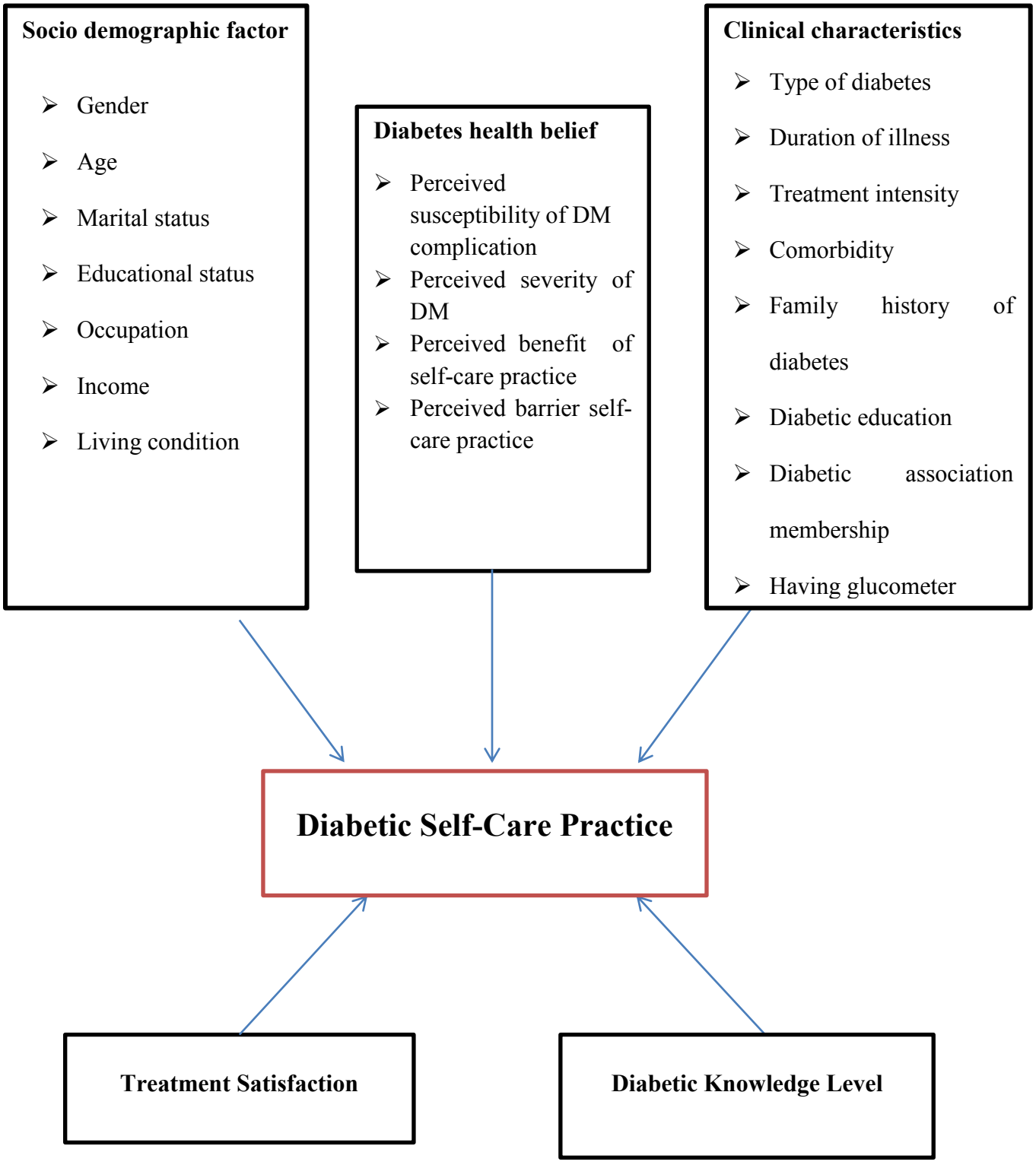

Figure 1: Conceptual framework on factors affecting self-care practice among diabetic patients developed from different literatures

3. OBJECTIVES

3.1 General objective

- To assess self-care practice and its associated factors among diabetics patients who were on follow-ups at public and private primary level health care in Addis Ababa, Ethiopia in 2015

3.2 Specific objectives

- To measure the magnitude of self-care practice among diabetic patients on follow up
- To identify factors associated with self-care practice among diabetic patients on follow up

4. METHODS AND MATERIALS

4.1 Study area

The study was conducted in Addis Ababa, the capital of Ethiopia and a Chartered City having three layers of Administration: City Government, 10 Sub City Administrations, and 116 Woreda Administrations. Addis Ababa covers an area of 530.14 square kilometers with 3,272,237 regional total populations in 2013/14.according to Addis Ababa Regional Health Bureau (AARHB)(43).

There were also 52 hospitals in the metropolis of which 6 were owned by AARHB, 5 by federal government, 3 by NGO's, 3 by Defense force and police and 35 by the private owners. There are 84 health centers owned by the city administration, and 3 by NGO's at present. There are also more than 760 private clinics at different levels. As a result, the potential health service coverage measures geographical accessibility in Addis is about 100%. AARHB is responsible to coordinate the overall health care activities of the city. Under its administration there are 6 hospitals, 1 public health laboratory and 2 health science colleges. There are also 10 sub-city health offices, which are directly accountable to their respective sub-city administration.

The total number of diabetic patients in AA was 30,053 according to AARHB report in 2012/13. Diabetic follow up service is given in hospitals, health centers as well as in higher clinics.

4.2 Study design and period

Facility based cross- sectional study was carried out using interviewer- administered questionnaire among primary level of care in Addis Ababa February 2 to march 7,2015.

4.3 Population

4.3.1 Source population

All type I and type II diabetic patients above or equal to18years who were on diabetic follow up among primary level of health care in Addis Ababa

4.3.2 Study population

All selected type I and type II diabetic patients above or equal to 18 years who were on diabetic follow up visits in the selected sub-cities health centers and private clinics in Addis Ababa during the study period.

4.3.3 Inclusion criteria

All diabetics' patients aged 18 years or over

A patient on management of diabetes who had at least 2 outpatient visits to the clinic within the previous two years

4.3.4 Exclusion criteria

Patients who were critically ill and those patients with severe mental illness who were unable to provide the required information by themselves

4.4 Sample size determination

The sample size was determined using the single population proportion by Epi Info window version 3.5.3 statistical software formula based on the following assumptions: the prevalence rate of good diabetic self-care practice was taken as 56 % from similar study conducted in Addis Ababa Tikur Anbessa specialized hospital (17), desired degree of precision was 5%,95% confidence interval and 1.5 design effect .Using a contingency of 5% for non-respondent with , the final sample size was 595 by using single proportion formula for sample size determination. , $n= Z^2\alpha/2\ p\ (1-p)/d^2$ where

z= the standard score corresponding 95% confidence level

P=proportion of diabetic patients with good self-care practice=56

d=margin of sampling error =5%

4.5 Sampling procedures

Multistage stratified sampling method was used. Among the ten sub cities in Addis Ababa city administration two sub cities; Bole and Kirkos selected randomly by lottery method. The health facilities under the sub cities giving diabetic follow up service were stratified in to public and private. Accordingly,7 public health center and 6 private higher clinics at Kirkos, and 9 public health center and 8 private clinics from Bole sub city were listed by assuming that the proportion of diabetes self-care practice would vary by place of treatment. Since the health centers have similar setting 2 health centers were selected by simple random sampling method out 7 health centers in Kirkos and 3 from the9 health centers in Bole sub city. From the private higher clinics as well 2 clinics from 6 private higher clinics in Kirkos and 3 clinics from 8 private higher clinics in Bole were selected randomly by lottery method. In each facility the total sample size was allocated proportionally according to the size of patients in one month preceding the data collection. Systematic random sampling technique was used to select study subjects from the selected facilities based on the flow rate during the study period that come for follow up during a month preceding the data collection. The sampling interval 'k' was obtained by dividing the sampling proportion in one months(N) to the number of sample(n) at each data collection site (n') i.e. k = N' /n'. The patients were selected every 2 to 5 interval according to the facility size calculated.

Table 1: Sampling interval (K) in AA, Bole sub city health centers and private higher clinics

Health Centers	k = N' /n'	Private Higher Clinics	k = N' /n'
Bole 17/health center (17HC)	250/108~2	22 mazoria higher clinic (22PC)	35/15~2
Goro health center (GHC)	28/12~2	Addis tena higher clinic (ADPC)	30/6~5
Delefere health center (DHC)	92/40~2	Haleluya higher clinic (HPC)	-12/5~3

Table 2: sampling interval (K) in AA, Kirkos sub city health centers and private higher clinics

Health Centers	k = N' /n'	Private Higher Clinics	k = N' /n'
Kazanchis health center (KHC)	150/65~2	universal higher clinic (UPC)	50/24~2
Kirkos health center (KirHC)	210/91~2	Senay higher clinic (SPC)	530/229~2

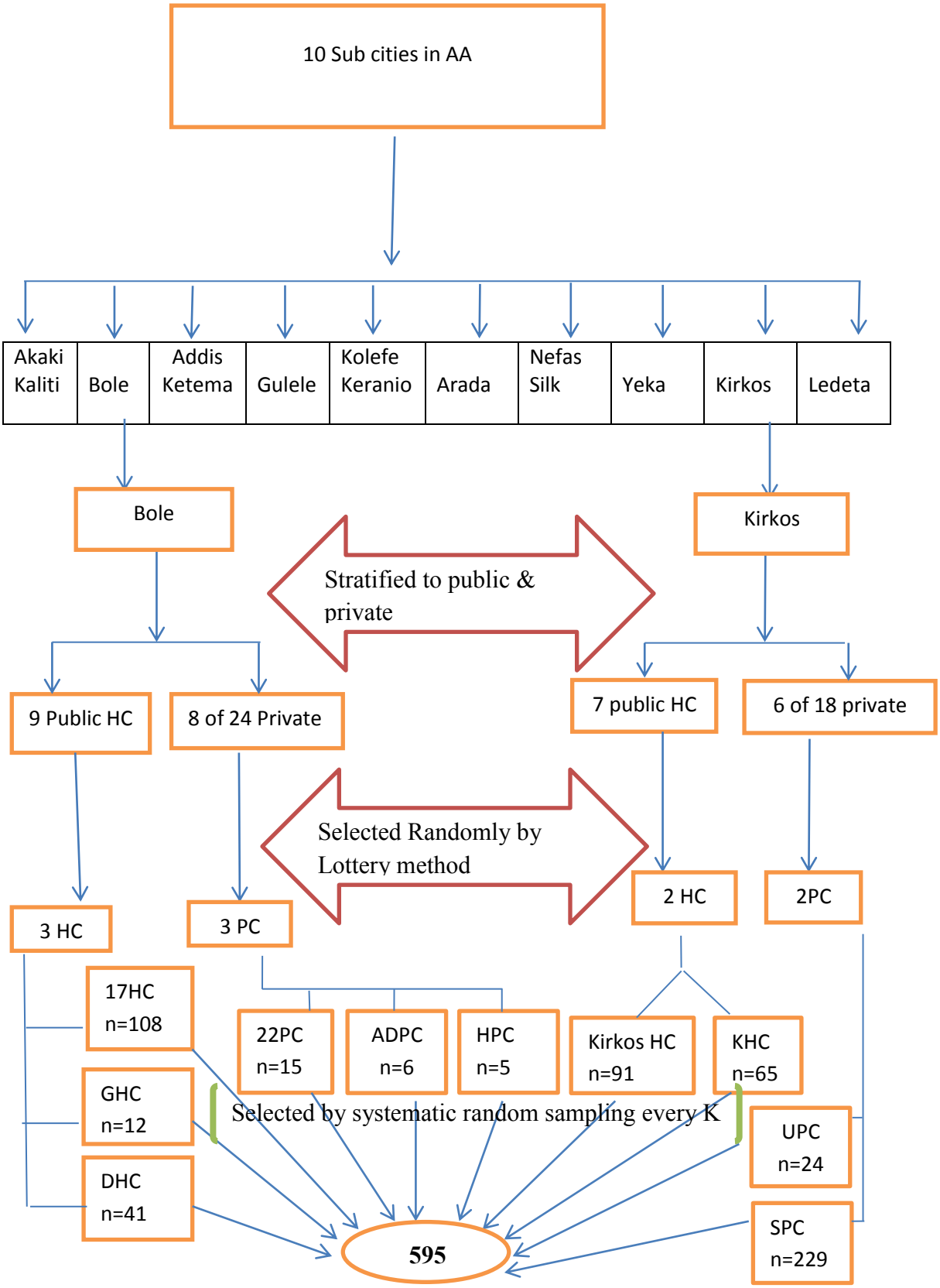

Figure 2: Schematic presentation of sampling procedure

4.6 Data collection procedure (Instrument, personnel, data quality control)

Data was collected using a structured interviewer administered questionnaire which has 6 subparts namely socio demographic, clinical characteristic, knowledge related questions, Diabetic treatment satisfaction questionnaire (DTSQ), health belief questions and self-care practice related question. DTSQ consists of six items assessing treatment satisfaction, each was scored on a scale of 0–6, with six representing the greatest satisfaction(44). Knowledge and practice questions consisting of 15 and 8 questions respectively were adapted and modified contextually from Medi media USA(45) and had been used in previous Knowledge and practice studies among diabetics and proven to be reliable in similar study in our country(18).

The diabetic health belief was assessed by adapting 16 item questionnaire , as developed by Given(46), on perceived susceptibility, perceived severity, perceived benefits, and perceived barriers, to measure the beliefs of diabetic patients about their diabetes which had proven to be reliable in similar study in Nigeria(42).

The questionnaire was initially prepared in English then translated in to local language (Amharic) by an individual who has good ability of the two languages then translated back to English by different person to ensure consistency. A week prior to the actual data collection, the questionnaire was pre-tested on 5% patients identified from health centers and private higher clinics which were not included in the actual data collection. Findings of the pretest were incorporated to modify and clarify the collection tool before the actual data collection. Data was collected by four trained BSc nurses and two supervisors (BSc health officer) for five weeks from February 2, to March 7, 2015 E.C.

4.7 Study variables

4.7.1 Dependent variable

- Diabetic Self-Care Practice

4.7.2 Independent variable

- **Socio-demographic factors:** age & sex of child, religion, educational, occupational, income and marital status
- **Clinical characteristic:** type of diabetes, duration of DM, family history of diabetes, type of treatment, comorbidity.
- **Diabetic Knowledge:** Knowledge about DM, Knowledge on diabetic self-care practices, Source of information, Consultation time
- **Treatment satisfaction:** Satisfaction with current treatment, convenience, treatment time flexibility, understanding of DM, recommendations.
- **Diabetes health belief:** Perceived susceptibility and severity of DM complication, Perceived benefit of self-care practice, Perceived barrier of self-care practice

4.8 Operational definitions

- **Diabetes self-care**: is a daily regimen tasks that the individual performs to manage diabetes (diet plan, regular exercise, daily medication and regular monitoring of blood glucose, daily foot care, regular checkup, check blood pressure at least every visit, yearly eye examination) (2, 47).
- **Regular checkup**: all patients who under taking investigations at least within three months. Those who were undertaking checkup within three months or less given a score of one and other wise zero(47).
- **Regular exercise**: 30 minutes activity involved in walking and running for at least five days per week(48).
- **Regular monitoring of blood glucose**: Monitoring of blood glucose at least once every week(18).
- **Adequate glycemic control for DM**: FBS measurement 70mg/dL -126 mg/dL (2, 49).
- **Inadequate glycemic control for DM**: FBS measurement ≥126 mg/dL (49).

- **Good self-care practice**: is those who scored the mean (5) and above the overall self-care practice score.
- **Poor self-care practice**: is those who scored below the overall mean self-care practice score
- **Good Knowledge:** respondents who answer correctly to knowledge related question and those who scored equal and above the overall mean value.
- **Poor knowledge:** respondents who answered in-correctly to knowledge related question and those who scored equal and above the overall mean value.
- **High income:** respondents whose income level is equal to the mean and above.
- **Low income:** respondents whose income level is below the mean.

4.9 Data quality management

The quality of data was assured before, during and after data collection process. Accordingly **Before data collection:** objective based and standardized questionnaire was prepared, training of data collectors and supervisors on sampling procedures, techniques of interviews and data collection process and supervisors participated in pre-testing of the questionnaire for its understandability by 5% of sample on volunteer individuals in the facilities which were not included in the actual data collection.

During data collection: the supervisors closely followed the day-to-day data collection process and ensure completeness and consistency of questionnaire administered each day.

After data collection: the collected information was rechecked for its completeness and consistency by the supervisors and the principal investigator before transferring in to computer software. Non overlapping numerical code was given for each question and the coded data was entered and cleaned in SPSS version 20 statistical software prepared template by two people.

4.10 Data analysis procedure

The collected data was checked for its completeness manually and then entered and analyzed using SPSS version 20 statistical software package. Descriptive statistic including proportion, percentage, ratios, frequency distribution, mean and standard deviation was used to describe the data on self-care practice.

A bivariate logistic regression model analysis was done to see the association between the explanatory and outcome variables. Then, multivariate logistic regression analysis was employed by selecting only variables with P-value <0.2 in the bivariate analysis. Odds ratio with 95% C.I was used to measure the strength between dependent and independent variables. P value < 0.05 was used to determine level of statistical significance.

4.11 Ethical consideration

The ethical approval for this study was obtained from the Research Ethical Committee of school of public health, Addis Ababa University, Permission letter was written for AARHB, Kirkos and Bole sub city health centers as well as the private clinics then informed consent was obtained from the participants, after the necessary explanation about the purpose, benefits and risks of the study and their right on decision to participate in the study. All the interviews with respondents were made under strict privacy. After getting informed consent from the respondents the right of the respondents to refuse answer for few or all of the questions was respected.

4.12 Dissemination of results

The final report of this study was submitted to College of Health Sciences School of Public health. It will also be sent to FMOH, Addis Ababa Health bureau, the health facilities and Ethiopian diabetic association. Effort will be made to disseminate through publication and presentation in scientific conferences.

5. RESULT

5.1 Descriptive

A total of 595 respondents participated in the study, yielding a response rate of 100%.

5.1.1 Socio demographic characteristics

Of 595 respondents, 343 (57.6%) were male. The mean (SD) age of the respondents was 53.5(14). One hundred forty four 24.2% of them were between 55 to 63 years of age group. Majority were 437(73.4%) married and 74(12.4%) were widowed. Among the study participants 106(17.8%) were illiterate, 102(17.2%) could read and write whereas 386(65.0%) attended formal education. Regarding occupation 232(39.3%) were self-employed, 160(27%) government employed, 108(1.3%) house wives and the rest 73(12.4%) were unemployed. Nearly half of respondents (46.6%) were Amhara followed by Oromo 161(27.1%). The large majority of respondents 552(92.8%) were living with family while the remaining 43(7.2%) lived alone. (Table 3)

Table 3: Socio demographic characteristics of study population on diabetes follow-up at health centers and private clinics in Addis Ababa, February 2015

VARIABLES	FREQUENCY	PERCENTAGE
Gender(n=595)		
Female	252	42.4
Male	343	57.6
Age (n=595)		
19-27years	12	2
28-36years	54	9.1
37-45years	116	19.5
46-54years	128	21.5
55-63	144	24.2
>64	141	23.7
Marital Status(n=595)		
Married	437	73.4
Single	66	11.1
Widowed	74	12.4
Divorced / separated	18	3
Educational Status(n=594)		
Illiterate	106	17.8
can read and write	102	17.2
Primary	52	8.8
Secondary	88	14.8
Certificate	56	9.4
Collage and above	190	32
Occupation(n=591)		
Student	8	1.4
Self employed	232	39.3
Government employed	160	27.1
Unemployed	73	14.0
House wife	108	18.3
Ethnicity(n=595)		
Oromo	161	27.1
Amhara	277	46.6
Tegere	91	15.3
Gurage	51	8.6
Other	15	2.5
Monthly Income(n=571)		
Low	371	65
High	200	35

5.1.2 Clinical characteristics of study participants

Near half of the respondents 309 (51.9%) didn't know their diabetes type. Of those who knew their diabetes type, 181(30.4%) had type II diabetes and 105(17.6%) had type I diabetes. The median (IQR) duration of diabetes was 5 (8) ranging from 6 months to maximum of 45 years, predominantly in 1-5 years. Of the 595 respondents, half 295(49.6%) reported that they did not get information about their diabetes and only 25(4%) received regularly. Only 55(9.6%) of respondents were a member of Ethiopian diabetic association. The majority 428(71.9%) of respondents did not have glucometer at home. Of the total respondents317 (53.3%) had their follow-up in public health centers while 278(46.7%) were attending in private higher clinics. Among the participants who know their fasting blood glucose 429 (72.9%), 47 (11%) had below the recommended level of glycemic control however more than half of the respondents 382 (89%) had poor glycemic control above the recommended level. Overall, the mean (SD) value of FBS for of the participants was 183(59.6) with minimum of 56 mg/dL and maximum of 479mg/Dl. (see table 4)

Table 4: The Clinical characteristics of the study population at diabetic on follow up at health centers and private clinics in Addis Ababa, February 2015

VARIABLES	FREQUENCY	PERCENTAGE
Type of DM(n=595)		
type one	105	17.6
type two	181	30.4
didn't know	309	51.9
Duration of DM(n=588)		
>1year	105	17.9
1-5year	213	36.2
6-10years	132	22.4
11-15years	67	11.4
>15yeas	71	12.1
Comorbidity(n=595)		
No	385	64.7
Yes	210	35.3
Treatment Intensity(n=595)		
Insulin injection	101	17
Oral medication	429	72.1
Both	14	2.4
Diet only	51	8.6
Family History(n=595)		
No	428	71.9
Yes	167	28.1
Place of follow up (n=595)		
public health center	317	53.3
private clinic	278	46.7
Knowing Current FBS(n=595)		
No	166	27.9
Yes	429	72.1
Current FBS(n=429)		
Adequate glycemic level	47	11
Inadequate glycemic level	382	89

5.1.3 Diabetes knowledge and source of information

The knowledge level was assed using 11 multiple response questions, the mean (+SD) diabetes knowledge score of respondents was 17.3(5.99%) with a maximum possible score of 24 and minimum zero. About 251(42.2%) respondents had poor diabetes knowledge while 339(57.5%) had good diabetes knowledge. Concerning the definition of diabetes more two third (72.3%) of respondents defined diabetes as a disease which affects any part of the body, 121(20.3%) defined it as a state of where only a raised blood glucose level and 44(7.4%) didn't know about it.

Family history of DM 501 (23.8%) followed by consuming too much fat and sugar 458(21.7%), alcohol 435(20.6%), smoking 388(18.4%) and overeating 44(7.4%)were identified risk factors described by respondents for diabetes. Insulin injection, oral medication, dietary modification and exercise at 369(19.9%), 498(26.8%), 507(27%) and (463)25% respectively were the identified treatment options. Tiredness 450(22%) and excessive trust 475(23 %) were more frequently identified symptoms of poorly controlled DM followed by Passing lots of urine 441(21.6%), weight loss 322(15.8%), and loss of appetite 300(14.7%).

Most respondents had identified ophthalmologic 447(28.6%) and renal and neurologic 395(25.3%) complications related to DM. Dietary modification 508(36.2%), exercise 489(38.8%), weight reduction 377(26.9%) ware identified as a life style modification for diabetes, however 30(2.1%) don't know any life style modifications. Most 531(89.2%) knew about the importance of controlling glucose as to reduce complication of DM. Five hundred eight (87.1%) of the respondents knew the importance of controlling blood pressure as a means to prevent DM complication.

For more than half (56.3%) of the respondents source of knowledge was medical staffs, 205(23%) from media and the remaining 183(20.6%) from friend and family. At first diagnosis the time devoted by the physician to discuss about DM was more than 20 minutes for 151(25.4%) of respondents, twenty minutes for 49(8.2%), greater than ten minutes for 82(13.8%), ten minutes for 125(21%) of the respondents, but 150(25%) of the respondents don't remember the time and 38(6.4%) of diabetic patients reported that the doctor did not discuss anything about diabetes.

During follow up 210(35%) respondents were given greater than ten minutes, ten minutes for 195(32.8%), five minutes for 36(6%), less than five minutes for 66(11%) but frothy four (7.4%) of the respondents reported no time was devoted for discussion and another 44(7.4%) participants didn't know the time they were given for discussion about their diabetes. Among respondents 265(44.5%) would like to access information's about DM through video or tapes, 190(31.9%) through both handouts/leaflets and videotapes as well, 99(16.6%) through handouts and leaflets only.

Table 5: Knowledge of Diabetes and source of information among study population, at public health centers and private clinics in Addis Ababa, February 2015

Variables	Frequency (n=595)	Percentage
Identify risk factors for diabetes		
Over eating	306	14.5
Family history	501	23.8
Eating too much fat and sugar	458	21.7
Alcohol	435	20.6
Smoking	388	18.4
Don't know	19	0.9
Treatment options for DM		
Insulin injection	369	19.9
Oral medication	498	26.8
Dietary modification	507	27.3
Exercise	463	25.0
Other	6	0.3
Don't know	12	0.6
Symptoms of poorly controlled DM		
Passing lots of urine	441	21.6
Loss apatite	300	14.7
Excess thirst	475	23.3
Tiredness	450	22.0
Weight loss	322	15.8
Don't know	55	2.7
Complications of DM		
Ophthalmologic	447	28.6
Hypoglycemic	324	20.3
Renal	395	25.3
Neurologic	395	25.3
Don't know	99	7.8
Life style modifications for DM		
Exercise	489	34.8
Dietary modification	508	36.2
Weight reduction	377	26.9
Don't know	30	2.1

*Multiple response questions

5.1.4 Treatment satisfaction of diabetes patients

The satisfaction level regarding service/treatment provided during their current visit was assessed using diabetes treatment satisfaction questionnaire (DTSQ) which was made available for 595 diabetes patients, the maximum possible score was 25 and minimum of five, with a mean (SD) score of 18(3.96) .Over all, more than half 342(57.5%) of respondents were satisfied with the treatment they were given. Among the respondents 253(42.5%), 440(73.9%), 411(69%),365(61.4%),385(64.9%) and 445(74.8%) had high level of satisfaction with current treatment given, treatment convenience, flexibility ,understanding of diabetes ,recommending treatment to other diabetic patients and treatment continuation respectively.(table 6)

Table 6: Diabetes treatment satisfaction among the study population at health centers and private clinics Addis Ababa, February 2015

Treatment of DM	Frequency	Percentage
Current treatment(n=595)		
Satisfied	342	57.5
Unsatisfied	253	42.5
Convenience(n=595)		
Satisfied	440	73.9
Unsatisfied	155	26.1
Flexibility(n=595)		
Satisfied	411	69.1
Unsatisfied	184	30.9
Understanding of diabetes(n=594)		
Satisfied	365	61.4
Unsatisfied	229	38.6
Recommendation(n=593)		
Satisfied	385	64.9
Unsatisfied	208	35.1
Treatment Continuation(n=595)		
Satisfied	445	74.8
Unsatisfied	150	25.2

5.1.5 Diabetes health belief

Diabetic health belief was assessed using 16 questions with four questions each assessing the perceived susceptibility to diabetes complications, perceived severity, perceived benefit and barrier to self-care practice. The perceived susceptibility of diabetes complication with mean (±SD) score was 15(±2.57) and a maximum possible score of 20 and minimum of 4.Accordingly more than half study participants reported high perceived susceptibility diabetes complications. Among the total number of respondents to perceived severity and its related complications with mean (SD) score 10.99(±3.8), three hundred frothy eight (59.5%) had high perceived severity. The mean (SD) score of perceived benefit and barrier to self-care practice were 16(2.6) and 12(3.06) respectively.

Table 7: Diabetes health belief among study population at health centers and private clinics Addis Ababa, February 2015

Variables		Frequency	Percentage
Perceived Susceptibility			
	Low	181	30.7
	High	409	69.3
Perceived Severity			
	Low	237	40.5
	High	348	59.5
Perceived Benefit			
	Low	158	26.6
	High	435	73.4
Perceived Barrier			
	Low	249	41.9
	High	345	58.1

5.1.6 Diabetic self-care practice

The mean (+SD) score of diabetes self-care practice of respondents was 4.5(1.79) with a maximum score of eight possible and minimum of zero. About 311(52.3%) had good self-care practice meanwhile 284(47.7%) had poor self-care practice.

Half (50%) of the respondents checked their blood pressure within week, 85(31%) within a month and 69(11.6%) three months ago. Two hundred fifty eight (43%) of respondents had last physician visit within a month or less, 181(30%) a month ago, 113(19%) two/three months ago, 35(5.9%) six months ago, while 8(1.3%) a year or above. More than half (53.4%) of them had checked their blood glucose level a week ago, 186(31.3%) a month ago, 57(9.6%) three month ago and 6(1%) don't check their blood glucose level regularly.

Almost half (49.2%) of the respondents managed their diet regularly, 240(40%) managed their diet occasionally and 62(10.4%) never managed their diet. Furthermore only 195(32.8%) had a regular exercise, 271(45.5%) exercise occasionally and 129(21.7%) study participants never managed their weight. Two hundred ninety (36.8%) respondents had never done an eye examination, 70(11.8%) had examination more than a year ago, 306(51.4%) within a year. One hundred eighteen (19.8%) respondents reported they checked their feet every day, 136(22.9%) checked occasionally, however more than half never checked their feet. Majority (76.3%) of respondents reported they had never forgotten their medication, 64(10.8%) forgotten taking their medication once or two times a week, and 40(6.8%) don't take their medications regularly but the rest 37(6.2%) were not on diabetes medication.

Over all few practiced regular exercise195(32.8%), daily foot care 118(19.8%).almost half had dietary adherence 293(49%) but regular blood pressure monitoring 557(93.6%),adherence to regular blood glucose testing 318(53.4%) and medication adherence 416(70%) were better practiced.

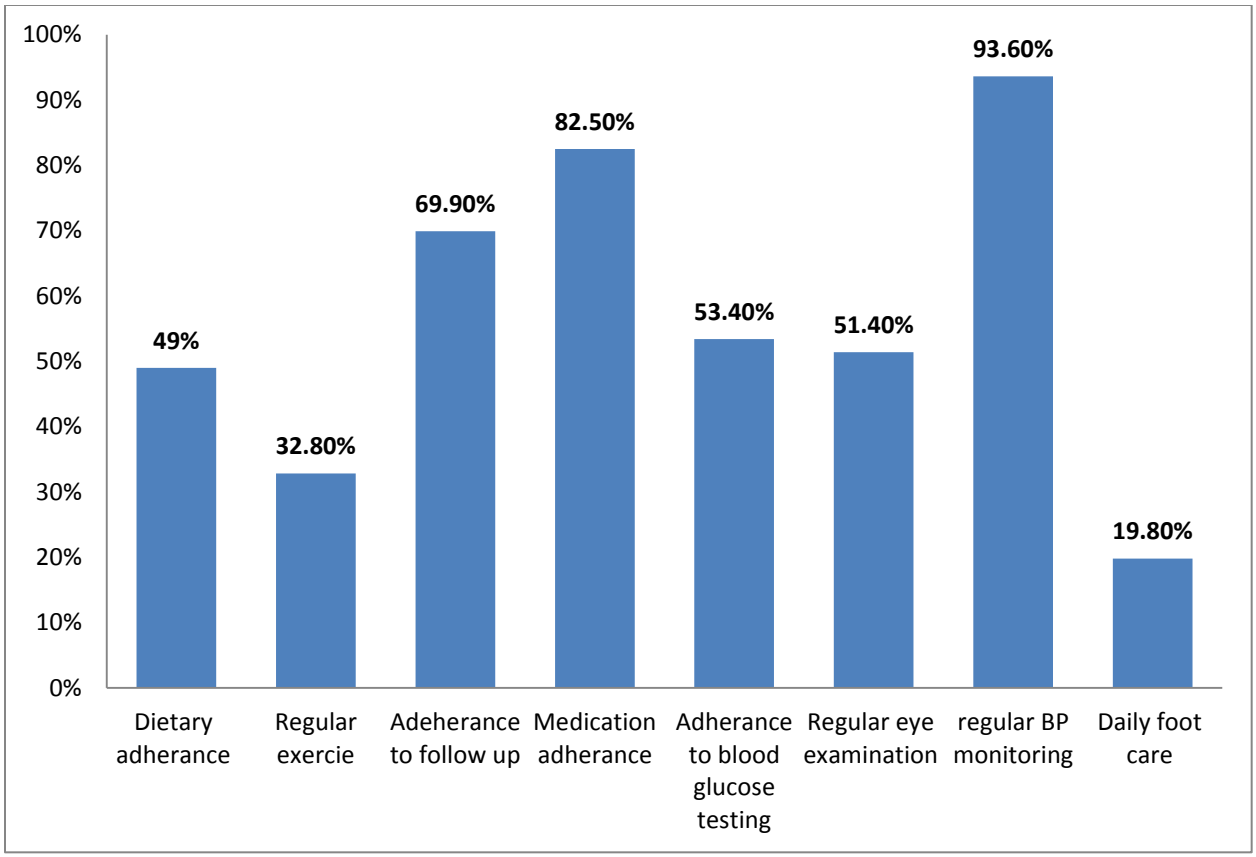

Figure 3: The magnitudes of diabetic self-care practice indicators among study population at health centers and private clinics in Addis Ababa, February 2015

5.2 Factors associated with Diabetic self-care practice

5.2.1Socio demographic factors associated with diabetic self-care practice

In bivariate analysis among the socio demographic characteristics of respondents' marital status, educational status, occupation, ethnicity social support and income showed significant statistical association with good diabetes self-care practice whereas age, gender and occupation did not have statistical association with diabetes self-care practice. Being single (COR= 0.67, 95%CI; 0.398-1.12), widowed (COR=0.43, 95%CI; 0.26-0 .72) and divorced or separated (COR=0.22, 95%CI; 0.07,-0.67) were less likely to be associated with good diabetes self -care practice as compared to married once. Good diabetes self-care practice was better practiced among respondents who attained primary educational level (COR=2.25, 95%CI; 1.5-4.42), secondary (COR=4.4, 95%CI; 2.4-8.11)and those above college or university (COR=2.42, 95%CI; 1.49-3.95))as compared to those who were illiterate. Having family support (COR= 1.570, 95%CI; 84-2.95) and high level of income (COR=1.7, 95%CI; 1.198-2.41) were also more likely to practice good self-care practice than patients living alone and low income respectively. (Table 8)

Table 8: Socio-demographic factors associated with diabetes self-care practice in Addis Ababa, health centers and private clinics, February 2015

Variables	self-care practice		COR(95%C.I)	P-value
	Good	Poor		
Gender				
Male	185(53.9)	158(46.1)	1.17 (.85-1.62)	0.341
Female	126(50)	126(50)	1	
Age				
19-27years	5(41.7)	7(58.3)	1	
28-36years	25(46.3)	29(53.7)	1.20(.34-4.28)	0.770
37-45years	55(47.4)	61(52.6)	1.26(.38- 4.21)	0.710
46-54years	73(57)	55(43)	1.85(0.56- 6.17)	0.310
55-63	87(60.4)	57(39.6)	2.13(0.65- 7.06)	0.210
>64	66(46.8)	75(53.2)	1.23(0.37- 4.07)	0.730
Marital status				
Married	249(57)	188(43)	1	
Single	31(47)	35(53)	0.67(0.40-1.124)	0.130
Widowed	27(36.5)	47(63.5)	**0.43 (0.26-0.72)**	**0.001**
Divorced / separated	4	14(77.8)	**0.216 (0.07- 0.67)**	**0.080**
Educational level				
Illiterate	40(37.7)	66(62.3)	1	
can read and write	40(39.2)	62(60.8)	1.07(.61- 1.87)	0.820
Primary	30(57.7)	22(42.3)	**2.25(1.15- 4.43)**	**0.019**
Secondary	64(72.7)	24(27.3)	**4.40(2.39-8.11)**	**<0.001**
Certificate	24(42.9)	32(57.1)	1.24(0.64-2.39)	0.526
Collage and above	113(52.4)	77(40.5)	**2.42(1.49- 3.95)**	**<0.001**
Occupation				
Student	5(62.5)	3(37.5)	1	
Self employed	125(53.9)	107(46.1)	0.70(0.16-3.00)	0.630
Government employee	80(50)	80(50)	0.60(0.14-2.60)	0.490
Unemployed	38(52.1)	35(74.9)	0.65(0.15- 2.93)	0.410
House wife	60(55.6)	48(44.4)	0.75(0.18- 3.30)	0.700
Social support				
No	18(41.9)	25(58.1)	1	
Yes	293(53.1)	259(46.9)	1.57(0.84-2.95)	0.160
Monthly Income				
Low	174(46.9)	197(53.1)	1	
High	120(60)	80(40)	**1.70(1.20-2.41)**	**0.003**

5.2.2 Clinical characteristics associated with diabetes self-care practice

In bivariate analysis among the clinical characteristics of respondents, duration of diabetes, co-morbidities, treatment intensity, family history, diabetic education, diabetes association membership, having glucometer at home, place of follow-up and knowing blood glucose level showed significance statistical association with good diabetes self-care practice. Diabetes duration of 11-15 years (COR=1.94, 95%CI; 1.04-3.63),the presence of co-morbidities (COR=1.83, 95%CI; 1.300, 2.581), family history of DM(COR=1.8, 95%CI; 1.265, 2.634) , diabetes association membership (COR=4.6, 95%CI; 2.289, 9.39), having glucometer at home (COR=3.17, 95%CI; 2.151, 4.667), follow up at private clinics (COR=4.4, 95%CI; 3.159, 6.320)1.46(1.02-2.09) and knowing their blood glucose level (COR=1.46, 95%CI; 1.02-2.09)were more likely associated with good diabetes self-care practice than their counter parts .Taking oral medication (COR=0.296, 95%CI; 0.18-0.48) and having no medication (COR=0.32,95%CI;0.16-0. 64) were less likely associated with good diabetes self-care practice as compared to taking insulin injection.(Table 9)

Table 9: Clinical characteristics associated with diabetes self-care practice among study population at public health centers and private clinics in Addis Ababa, February 2015

Variables	Self-care practice		COR(95%C.I)	P-value
	Good	Poor		
DM type				
type one	57(54.3)	48(45.7)	1	
type two	119(65.7)	62(34.3)	1.6(0.989- 2.643)	0.056
don't know	135(43.7)	174(56.3)	0.65(0.419- 1.019)	0.061
duration of DM				
>1year	47(44.8)	58(55.2)	1	
1-5year	117(54.9)	96(45.1)	1.5(0.94-2.41)	0.089
6-10years	69(52.3)	63(47.7)	1.35(0.81 2.26)	0.251
11-15years	41(61.2)	26(38.8)	**1.94(1.04- 3.63)**	0.037
>15yeas	33(46.5)	38(53.5)	1.07(0.59 - 1.96)	0.822
Co-morbidity				
No	181(47)	204(53)	1	
Yes	130(61.9)	80(38)	**1.83(1.30- 2.58)**	**0.001**
Treatment intensity				
insulin injection	76(75.2)	25(24.8)	1	
oral medication	203(52.7)	226(47.3)	**0.29(0.18-0.48)**	**< 0.001**
Both	7(50)	7(50)	0.33(0.11- 1.03)	0.056
No medication	25(49)	26(51)	**0.32(0.16-0. 64)**	**0.002**
Family history				
No	206(48.1)	222(51.9)	1	
Yes	105(62.9)	62(37.1)	**1.8 (1.27-2.63)**	**0.001**
Diabetes education				
No	168(56.9)	127(43.1)	1	
yes some times	130(47.3)	145(52.7)	**0.68(0.49- 0.94)**	**0.021**
yes regularly	13(52.0)	12(48.0)	0.82(0.36- 1.86)	0.632
Diabetic association membership				
No	266(49.3)	274(50.7)	1	
Yes	45(81.8)	10(18.2)	**4.6(2.29-9.39)**	**< 0.001**
Having glucometer at home				
No	191(44.6)	237(55.4)	1	
Yes	120(71.9)	47(28.1)	**3.17(2.15- 4.67)**	**< 0.001**
Place of follow-up				
public health center	113(35.6)	204(64.4)	1	
private clinic	198(71.2)	80(28.8)	**4.47(3.16- 6.32)**	**< 0.001**
Knowing current FBS				
No	75(45.5)	90(54.5)	1	
Yes	236(54.9)	194(45.1)	**1.46(1.02-2.09)**	**0.040**
FBS				
Adequate glycemic	23(48.9)	24(51.1)	1	
Inadequate glycemic	171(44.8)	211(55.2)	1.18(0.65-2.17)	0.590

5.2.3 Diabetes knowledge, treatment satisfaction and diabetes health belief associated with diabetes self-care practice

In bivariate analysis, good diabetes knowledge(COR=2.89,95%CI;2.07-4.04), diabetes treatment satisfaction (COR=1.94,95%CI;1.4-2.69), high perceived severity of diabetes complications(COR=1.94,95%CI;1.4-2.69) , high perceived benefit and barriers of diabetes self-care practice (COR=1.47,95%CI;1.5-1.01) and (COR=1.58,95%CI;1.14-2.19)respectively were statically associated with good diabetes self-care practice than their counter parts.(Table 10)

Table 10: Diabetes knowledge, treatment satisfaction and diabetes health belief associated with diabetes self-care practice in Addis Ababa health centers and private clinics, February 2015

Variables	Self-care practice		COR(95%C.I)	P-value
	Good	Poor		
Diabetes Knowledge				
Poor	93(37.1)	158(62.9)	1	
Good	215(63.4)	124(36.6)	**2.89(2.07- 4.04)**	**< 0.001**
Treatment Satisfaction				
Unsatisfied	122(43.6)	158(56.4)	1	
Satisfied	189(60)	126(40)	**1.94(1.40- 2.69)**	**< 0.001**
Perceived susceptibility				
Low	90(49.7)	91(50.3)	1	
High	217(53.1)	192(46.9)	1.14(1.1-0.8)	0.462
Perceived severity				
Low	152(64.1)	85(35.9)	1	
High	156(44.8)	192(55.2)	**1.94(1.4-2.69)**	**< 0.001**
Perceived benefit				
Low	72(45.6)	86(54.4)	1	
High	239(54.9)	196(45.1)	**1.47(1.5-1.01)**	**0.044**
Perceived barrier				
Low	114(45.8)	135(54.2)	1	
High	197(57.1)	148(42.9)	**1.58(1.14-2.19)**	**0.007**

5.3 Over all factors associated with diabetes self-care practice

Variables with p-value less than 0.2 on bivariate analysis were entered to multivariate analysis. Among these variables which were entered to multivariate analysis marital status, type of DM, co-morbidities, treatment intensity, diabetes association membership, having glucometer at home, place of follow up, diabetes treatment satisfaction were the independent predictors of good diabetic self- care practice.

The likelihood of good self-care practice was 77% less for separated or divorced than married one's (AOR=0.23,95%CI,0.05-0.89). The presence of co-morbidities was 1.7 times more associated with good self-care practice than patients without comorbidities (AOR=1.68, 95%CI; 1.07-2.65).Patients who do not know their diabetes were 65% less likely to practice good self-care practice than type one diabetic patients (AOR =0.35, 95% CI; 0.19-0.67).Patients taking oral medication were also 49% less likely to practice good diabetes self-care practice as compared to patients taking insulin injection (AOR=0.53, 95%CI; 0.28-0.98).A diabetic association membership, having a glucometer at home and attending in private clinic was 3 times (AOR = 3.02,95%CI;1.30-7.04), 2.01 times (AOR=2.01,95%CI;1.19-3.38), 3 times (AOR =3.05,95%CI;1.55-5.97) were more likely to adopt good self-care practice compared to patients who were not a diabetic association member, who do not have glucometer at home and those who attend in public health centers respectively. Diabetic patients satisfied with their treatment were also 1.7 times more adherent to good diabetes self-care practice than unsatisfied patients (AOR=1.69,95%CI;1.08-2.59).(Table11)

Table 11: Multivariate logistic regression model for diabetes self-care practice with associated factors among study population at public health centers and private clinics in Addis Ababa, February 2015

Variables	Self-care practice		COR(95%C.I)	AOR(95% C.I)
	Good	Poor		
Marital Status				
Married	249(57)	188(43)	1	1
Single	31(47)	35(53)	0.67(.398, 1.124)	0.81(0.39-1.71)
Widowed	27(36.5)	47(63.5)	0.43 (.261, .722)	0.81(0.42-1.58)
Divorced / separated	4(22.2)	14(77.8)	0.216 (.070, .666)	**0.20(0.05-0.89)***
DM Type				
type one	57(54.3)	48(45.7)	1	1
type two	119(65.7)	62(34.3)	1.6(0.989, 2.643)	0.93(0.47-1.82)
don't know	135(43.7)	174(56.3)	0.65(0.419, 1.019)	**0.35(0.19-0.67)****
Comorbidity				
No	181(47)	204(53)	1	1
Yes	130(61.9)	80(38)	1.83(1.300, 2.581)	**1.68(1.07-2.65)***
Treatment intensity				
insulin injection	76(75.2)	25(24.8)	1	1
oral medication	203(52.7)	226(47.3)	0.296(0.18-0.48)	**0.53(0.28-0.98)***
Both	7(50)	7(50)	0.33(0.11, 1.03)	0.83(0.18-3.97)
No medication	25(49)	26(51)	0.32(0.16-0. 64)	1.31(0.51-3.35)
Diabetic association membership				
No	266(49.3)	274(50.7)	1	1
Yes	45(81.8)	10(18.2)	4.6(2.289, 9.388)	**3.02(1.30-7.04)***
Having glucometer at home				
No	191(44.6)	237(55.4)	1	1
Yes	120(71.9)	47(28.1)	3.17(2.151, 4.667)	**2.01(1.19-3.38)****
Place of treatment				
public health center	113(35.6)	204(64.4)	1	1
private clinic	198(71.2)	80(28.8)	4.47(3.159, 6.320)	**3.05(1.55-5.97)****
Treatment satisfaction				
Unsatisfied	122(43.6)	158(56.4)	1	**1**
Satisfied	189(60)	126(40)	1.94(1.401, 2.693)	**1.69(1.09-2.59)***

* P- value < 0.05, ** p-value< 0.01

6. DISCUSSION

There is a limited literature regarding the diabetes self-care practice among patients who are on follow up in public and private primary level of health care in Ethiopia, particularly in Addis Ababa where higher number of health centers and private clinics are found, therefore this study attempts to assesses the magnitude of diabetes self-care practice and associated factors among patients on follow up at public and private primary level health care.

The magnitude of good diabetes self-care practice was 311(52. 3%) among diabetic patients on follow-up at public health centers and private clinics in Addis Ababa.

From the available study finding, the magnitude of diabetes self-care practice is not consistent, accordingly, the magnitude of this study finding was lower than the study done in Iran (73.8%) but higher than the study conducted in Kenya (41%) and UAE in 2013(27, 28, 50). However it was consistent to the study conducted in Addis Ababa Tikur Anbessa specialized hospital(17),in Dilla university hospital(20)and Nekemte Referral Hospitals in 2013(19) which were 56%,76.8% and 55% respectively however higher than the study conducted in Harari town (39%)(29)and Felege Hiwot Hospital, Northwest Ethiopia (36%)(18).The variation might be due to health care accessibility and even if the health care were accessible the waiting time and short consultation time might discourage patents from attending their follow-ups and accessing the required information regarding self-care practices as well as from regularly monitoring their blood glucose level and blood pressure. Even though adequate diabetes self-care practice can be achieved through patient centered communication and empowering patients, physicians might fail to devote adequate time for discussion to educate and motivate patients to follow the recommended diabetes self-care practice due to high number of patients in the facilities.

Dietary adherence was about 49 % which is similar to the study in Dilla specialized hospital 2014(49.7%) but lower than the study in Addis Ababa Tikur Ambesa specialized hospital 78% and in Harari town 57.5 (20, 29).This variation may be due to the difference in the setting, measurement variation or patients poor perception towards fruits and vegetables or patients difficulty to differentiate the recommended diet. Since there is no one set of nutritional recommendation that apply to all diabetes patients dietary recommendation had to be based on

individuals habit and preference by thoroughly discussing with their physicians(8), which might not apply to this setting.

Adherence to exercise was 32% similar to the study in Eastern Ethiopia, Harari town 31% but lower than the study conducted in Qatar (39.3%) , Pakistan (66%) and northwest Ethiopia in Felegehiwot hospital 50.2%.(18, 34, 39).Daily foot care, which was the least (19.8%) practiced self-care among the respondents was also lower than the study conducted Qatar (52.3%).This variation might be due to failure of physicians to explain the importance of exercise and foot care.

The study revealed that regular monitoring of blood glucose was 53.4% which was higher than the study conducted in Felege Hiwot Hospital, Northwest Ethiopia 2012(18) indicating 23.6% checked their blood glucose level within a month and less. Among respondents who knew their FBS 429, 89% had inadequate FBG , which was higher than the study in Ambo general hospital (55.8%) and in Jimma university hospital (81.7%)(48, 49).These might be due to the difference in life style ,as Addis Ababa is the biggest city in the country people may take different means of transportation where as in relatedly smaller cities like that of Ambo and Jimma patients may most likely take long walks which results in lowering their blood glucose level. It could also be due patients' failure to regularly monitor their blood glucose level or different instruments used.

The study in Pakistan(34)indicated 38% received a diabetes education at clinics however, this study indicated 50.4% received diabetes education which is also higher than the study conducted in Addis Ababa diabetes health care system in 2005(51) where only 24% received diabetes education. This variation might be due to the improved health service coverage in the city.

Diabetes knowledge level was found to be 57.5 % in the study lower than the study in UAE (69%), Qatar 65.8% however it was similar with the study in western Ethiopia, Nekemte hospital (54.3%), North West Ethiopia Felegehiwot hospital (49.8%)(18, 19, 39, 50) .

The source of diabetes information was medical staff for 56%, media (23%) and family and friends 20% similar with the study in Qatar indicated 69% source of information was medical staff and 15% media whereas the study in northwest Ethiopia, Felegehiwot hospital indicated the source of information was medical staff (86%),Medias(6%)and friends and relatives (9%).This

indicates that the involvement of media in diabetes education might have improved or it might be due to patient's better access to the media.

Regarding patients consultation time the study indicated 73.5% were given greater than ten minutes for consultation during follow which was better than the study conducted in Jimma indicating 84% participants lasted less than ten minutes (48)and northwest Ethiopia Felegehiwot hospital indicated 27% were consulted for 10 minutes(18). As diabetes self-care practice accounts about 95% of diabetes management (9)patients must be well aware of the corresponding self-care practices even though in this study substantial (73.5%) number had adequate consultation time as compared to the previous studies, 18.5% of respondents were given less than five minutes for consultation and 8% were not given any time at all. Therefore this may indicate there may have been improvement in consultation time or it may also have been due to the difference in the setting.

According to the study being divorced/ separated was associated with poor self-care practice which is consistent to the study done in USA in 2010 and Felege Hiwot hospital, northwest Ethiopia(18) which may be due to low emotional support.

Patients taking oral medication were less likely to practice good diabetes self-care practice as compared to patients taking insulin injection in line with the study done in urban area of Uremia, Northwest of Iran in 2010(27) which indicated insulin injection was significantly associated with self-care practice. These might be due to patients on insulin injection are more likely to notice the effect immediately than patients on oral medication.

The presence of comorbidities was found to be associate with good self-care practice in line with the study in Pennsylvania State University Diabetes Database(36). But the study in North West Iran in 2010(27)indicated there was no significant association and the study in Tikur Ambesa(17)also indicated those without diabetic complication adhered three times more to self-care practice than their counter parts. This variation might be due the sample size or setting.

Diabetic association membership was also significantly associated with good diabetes self-care practice which was in line with the study in Felegehiwot (18). This might be due to the associations regular monthly diabetic education and Support given to patients such as securing

medicine to some of the lower income members and blood glucose testing with a relatively lower price. However according to this study among 540 (90.8%) who were not members of a diabetic association, 149(25.1%) didn't know there was a diabetes association which may be due to the associations' poor advocacy and/or the physicians 'negligence to explain about importance of the diabetic association to gather information about diabetes self-care practice.

The study also indicated having glucometer at home was 2 times more associated with good self-care practice similar to the study in Tikur Ambesa which indicated having glucometer was associated with self-monitoring of blood glucose level(17).Therefore having glucometer at home might reinforce patients to control their blood glucose level regularly.

Among subjects who participated in the study, patients attending their follow up in private clinic were more associated with good self-care practice than patients who attend their follow up in public health centers which was consistent with the study conducted in Pakistan(34), which indicated adherence to diabetic self-care practice was significantly higher in private consulting clinics than community health centers. This might be due to less waiting time and longer consultation time during their visit in private clinics which could reinforce their adherence to physician visit and in most of the private clinics the follow up is given by specialized diabetic physician where us in the public health centers the service is given by general practitioners and health officers. It may also have been due to the income, educational status, occupation and other factors which might have influenced patients attending in these facilities.

Diabetes treatment satisfaction was 1.7 times more associated with good diabetes self-care practice than unsatisfied once in agreement with the study conducted in Israel in 2009(40),which identified that lower treatment satisfaction is related to difficulties in adherence to taking medications and attending follow-up clinic visits among other factors. Therefore improving diabetes patient satisfaction can reinforce patients' adherence to the recommended diabetes self-care practices.

7. STRENGTHS AND LIMITATIONS

Strengths

The strength of these study were use of contextually adapted standardized questionnaire, the use of health belief model and high response rate since there were no similar studies conducted in the facilities.

Limitations

The limitations of these study was patients selected into the study were on regular follow up and therefore likely to be motivated in acquiring knowledge on diabetes self-care practices where these may therefore not be a true reflection of the entire clinic attendance. There also may have been recall bias and social desirability bias since the self-care practices of the study participants were based on self-reports and performance of these behaviors was not observed and could not be confirmed.

8. CONCLUSION

This study revealed that a substantial number 284 (47.7%) of respondents in Addis Ababa health centers and private clinics had poor self-care practice. Regular exercise and daily foot care were the least practiced diabetes self-care practice. About half of the respondents had less dietary adherence, to blood glucose testing and regular eye examination.

Being divorced /separated, not knowing their diabetes type and taking oral medication was associated with poor self-care practice whereas the presence of comorbidities, having glucometer at home, being a member of diabetic association, attending follow up in private clinics and treatment satisfaction were associated with good self-care practice.

9. RECOMMENDATIONS

Policy makers and planners

Planner and policy maker need to address the high proportion of uncontrolled glycemic level among diabetes patients through advocating and supporting Self-monitoring of blood glucose (SMBG) which is vital for improving glycemic control through handouts/leaflets and videotapes as most preferred by the majority of respondents.

The Health care and the professionals

Public health centers should advice and empower patients to adhere to the recommended diabetes self-care practices and health facilities in general should improve the diabetic patient treatment satisfaction through managing the follow up time more flexible and convenient for patients and devoting adequate time for consultation during each visit.

Health care providers need to spend more time in notifying the patient's diabetes type and the corresponding diabetic self-care that should be taken, especially focus on patients taking oral medication. Advocate on diabetes association membership as well as the importance of having glucometer at home and daily self-monitoring to attain the recommended level of FBS.

Researchers

Furthermore investigation is needed to identify the reasons for poor adherence to regular exercise, foot care, and dietary adherence and identify factors

Professional associations

The Ethiopian Diabetes association needs to advocate on the benefits of the diabetes association membership and the recommended self-care practices.

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10. REFERENCES

1. Boon N, Cumming A, JOHN G. Davidson's principle and practice of medicine 2007.
2. American Diabetes Association. Standard Diabetes Medical Care 2014.
3. International Diabetes Association. Diabetes Atlas: summery sheet. IDF, 2013.
4. International Diabetes Federation. Diabetes Atlas: fact sheet. Brussels, Belgium: IDF, 2013.
5. Inernational Diabetes Federation. Diabetes Atlas:what is diabetes. IDF, 2013.
6. Frank B. Globalization of Diabetes:The role of diet, lifestyle, and genes. Boston, Massachusetts: American Diabetic Associasion, 2011 1.
7. Dan L, Anthony F, Dennis K, Stephen H, Joseph L. Harrisons principle of internal medicine 2008.
8. American Association of Diabetes Educators. AADE7 Self-Care Behaviors. Diabetes Educ. Chicago, Illinois: Diabetes Educ 2008. p. 445-9.
9. Diabetes UK Improving supported self-management for people with diabetes. 2009.
10. Ramachandran A, Snehalatha C, SamithShetty A, Nanditha A. Trends in prevalence of diabetes in Asian countries. 2012.
11. Beran D, Yudkin J. Diabetes care in sub-Saharan Africa. Lancet 2006:1689–95.
12. International Diabetes Faderation. Diabetes Atlas. Brussels, Belgium: IDF, 2006.
13. Yemane T, Belachew T, Asaminew B, Befekadu O. Type 2 Diabetes Mellitus in Jimma Town, Southwest Ethiopia. . Ethiopia J Health science. 2007;17(2).
14. Feleke Y, Enquselassie F. Cost of Hospitalization of Diabetic patients admitted at Tikur Anbessa specialized Hospital,Addis Ababa ,Ethiopia. Ethiop med J. 2007;45(3):275-82.
15. UK D. Recommendations for the provision of services in primary care for people with diabetes. 2005.
16. Word Health Organization. diabets fact sheet WHO; 2010. p. 1-2.
17. Kalayou K, Alemayehu B, Haftu B. Adherence to Diabetes Self-Management Practices among Type Ii Diabetic Patients in Ethiopia; A Cross Sectional Study. Greener Journal of Medical Sciences 2012;3(6):211-21.
18. Solomon A, Chalachew M, Hawult T. Assessment of the Level and Associated Factors with Knowledge and Practice of Diabetes Mellitus among Diabetic Patients Attending at FelegeHiwot Hospital, NSorthwest Ethiopia. . Clinical Medicine Research. 2013;2(6):110-20.
19. Tadele A, Tefera B, Endalew H, Negalign B. Self Care Practice And Its Predictors Among Adults With Diabetes Mellitus On Follow Up At Nekemte Hospital Diabetic Clinic, West Ethiopia. World Journal of Medicine and Medical Science. 2014;2(3):1-16.
20. Addisu Y, Eshete A, Hailu E. Assessment of Diabetic Patient Perception on Diabetic Disease and Self-Care Practice in Dilla University Referral Hospital, South Ethiopia. J Metabolic Synd. 2014;3(4): 1-8.
21. UK Prospective Diabetes Study Group. UK Prospective Diabetes Study:Complications of newly diagnosed type 2 diabetic patients and their association with different clinical and biochemical risk factors. Diabetes Research. 1998;13(1):1-11.
22. Centers for Disease Control and Prevention. National diabetes fact sheet: national estimates and general information on diabetes and prediabetes in the United States. Atlanta, GA: U.S. Department of Health and Human Services, CDC, 2011.

23. Anderson R, Funnell M, Butler P, Arnold M, Fitzgerald J, Feste C. Patient empowerment. Results of a randomized controlled trial. . Diabetes Care. 1995;18:943–9.
24. Toljamo M, Hentinen M. Adherence to self-care and glycaemic control among people with insulin-dependent diabetes mellitus. Journal of Advanced Nursing 2001;34:780-6.
25. CDC. Diabetes Report Card. Atlanta, GA: Centers for Disease Control and Prevention, US Department of Health and Human Services, 2012.
26. Irasema R, Manoel A, Tatiane A, Maria L. Self-Care of Patients with Diabetes Mellitus Cared for at an Emergency Service in Mexico. Rev Latino-Am Enfermagem. 2010;18(6):1.
27. Zahra Y, Reza P, Mohammad R, Nastaran A, Leila R, Mohammad Y. Assessment of Self-Care Practice and Its Associated Factors among Diabetic Patients in Urban Area of Urmia, Northwest of Iran. Journal of Research in Health Sciences 2011;11(1):33-8.
28. MainaEW W, Ndegwa Z, Njenga E, Muchemi E. Knowledge, attitude, and practices related to diabetes among community members in four provinces in Kenya. African Journal of Diabetes Medicine. 2011;19.
29. Ketema A, Bisrat T, Lakew A, Tizta T, Eshetu G. Self Care Behavior among Patients with Diabetes in Harari, Eastern Ethiopia: The Health Belief Model Perspective. Plos One 2012;7(4).
30. Zanetti M, Baquedano I, Martins T. Self-Care of Patients with Diabetes Mellitus Cared for at an Emergency Service in Mexico. Rev Latino-Am,Enfermagem. 2010;18(6):1195-202.
31. Samuel-Hodge C, Watkins D, Rodwell K, Hooten E. Coping Styles, Well-Being, and Self-care Behaviors Among African Americans with Type 2 Diabetes. The Diabetes Educator. 2008;34(3):501.
32. Wu S, Courtneyb M, Edwards H, McDowel J, Shortridge-Bagget L, Chang P. Self-efficacy: outcome expectations and self-care behavior in people with type 2 diabetes. Taiwan Journal of Nursing and Healthcare of chronic Illness in association with Journal of Clinical Nursing. 2007;16(11c):250-7.
33. Baumann L, Ellison S, Olson L, Opio C, Otim M. Self-care beliefs and behaviors in Ugandan adults with type 2 diabetes. The Diabetes Educator. 2010;36(2):293-300.
34. Rafique G, Azam SI, White F. Diabetes knowledge, beliefs and practices among people with diabetes attending a university hospital in Karachi, Pakistan. Eastern Mediterranean Health journal. 2006;12(5).
35. Ortiz L, Cabriales E, Gonzalez J, Meza M. Self-Care behaviors and health indicators in adults with type 2 diabetes. Rev Latino-Am Enfermagem. 2010;18(4):675-80.
36. Beverly EA, Wray LA, Chiu CJ, & Weinger K. Perceived challenges and priorities in co-morbidity management of older patients with Type 2 diabetes. Diabetic Medicine. 2011;28(781-784).
37. Surendranath A, Nagaraju B, Padmavathi G, Anand S, Patan F, Balachandra G. To Assess The Knowledge And Practice Of Insulin Self-Administration Among Patients With Diabetes Mellitus. Asian Journal of Pharmaceutical and Clinical Research. 2012;5(1).
38. Okolie V, Ehiemere O, Iheanacho N. Knowledge of diabetes management and control by diabetic patients at Federal Medical Center Umuahia Abia State, Nigeria. International Journal of Medicine and Medical Sciences. 2009;1(9):353-8.
39. Mohsen M, Aizeldin E, Mohamed G. Knowledge and Practice of Type 2 Diabetic Patients Attending Primary Health Care in Qatar. Middle east journal of medicin. 2011 9(4).
40. Biderman A, Noff E, Harris S, Friedman N, Levy A. Treatment satisfaction of diabetic patients: what are the contributing factors? Family Practice. 2009;26:102-8.

41. Chapman KM, Ham JD, Liesen P, Winter L. Applying behavioral models to dietary education of elderly diabetic patients. Journal of Nutrition Education. 1995;27:75-9.
42. Samuel OA. Diabetes Knowledge, Health Belief, and Diabetes Management Among the Igala, Nigeria. SAGE Open. 2014;4:1-8.
43. AARHB. Addis Ababa Regional Health Bureau anual report ADDIS ABABA: Addis Ababa Regional Health Bureau 2015.
44. Bradley C, Plowright R, Stewart J, Valentine J, Witthaus E. The Diabetes Treatment Satisfaction Questionnaire change version (DTSQc) evaluated in insulin glargine trials shows greater responsiveness to improvements than the original DTSQ Health and Quality of Life Outcomes. 2007;5(57).
45. Dinesh k, subish P, Ravis S, Paranaya. Knowledge, attitudes and practice about diabetes among diabetes patient in western NepaL. Rawal Med J 2008;33(8-11).
46. Given CW, Given BA, Gallin RS, Condon JW. Development of scales to measure beliefs of diabetic patients. Research in Nursing and Health. 1983;6(127-141).
47. DRWF. what is diabtes Diabetes wellness and research foundation,. 2014;1(1).
48. Angamo M, Melese B, Ayen W. Determinants of Glycemic Control among Insulin Treated Diabetic Patients in Southwest Ethiopia: Hospital Based Cross Sectional Study. PLoS ONE. 2013;8(4).
49. Temesgen Tegegne G, Shiferaw A, Kefale Gelaw B, Degu Amsalu, Minyahil Alebachew Woldu Glycemic Control and Self-Care Practice among Ambulatory Diabetic Patients in Ambo General Hospital, West Showa, Ethiopia. Global Journal of Medical Research: BPharma, Drug Discovery, Toxicology and Medicine. 2014;14(7):1. Global Journals Inc. (USA).
50. Al-Maskari F, El-Sadig M, Al-Kaabi JM, Afandi B NN, et a. Knowledge, Attitude and Practices of Diabetic Patients in the United Arab Emirates. PLoS ONE. 2013;8(1).
51. Yeweyenhareg F, Enquselassie F. An assessment of the health care system for diabetes in Addis Ababa, Ethiopia. Ethiopian journal of health development. 2005;19(3).

ANNEXES

Addis Ababa University

School of public health

Annex 1: Subject Information Sheet

My name is …….. I am here on behalf of Berhan Tassew student of Addis Ababa University school of public health She is conducting a research on ‘’assessment of self-management practice and associated factors among diabetic patients in public health centers and private clinics in Addis Ababa, Kirkos sub city. She received permission from Addis Ababa university school of public health and the Kirkos sub city health beauro for administrators to conduct this study.

You are selected by systematic random sampling method to participate in this study because you currently attending diabetic patient follow up. Your participation is purely based on your willingness .You have the right to choose not to take part in this study. If you choose to take part, you have the right to stop at any time. If you are willing to participate or refuse or decide to withdraw later, you will not be subjected to any ill-treatment.

If you agree to participate in the study, you will be asked to answer some questions about yourself, your household environment and your child care practice. The interview with you will take about 20 minutes.

The study will help u to practice the recommended self-care practice to prevent further complications. It can also provide base line data for policy makers and other researchers for further improvements diabetic education. The information that you provide will be kept confidential by using only code numbers and locking the data. Do not give your name. No one will have access to the non-coded data except the principal investigator and the data will not be used for purposes other than the study. Your willingness and active participation is very important for the success of this study.

Address: Cell phone +251 (0) 911365200 Email: tassewberhan@gmai.com

Questionnaires ID_____

Annex 2: Informed Consent Form

Based on the understanding of the information I gave you, are you willing to participate in this study? A) Yes B) No

(1) If yes, I will continue and 2) if no I will skip to next participant after writing the reasons of refusal.

Respondent

Signature _____Date_____

Interviewer

Name_____ Signature_____

Questionnaires number_____

Date of interview_____ Starting time_____ Completed_____

Result of interview A) Completed B) Not completed C) Partially completed D) Refused

Checked by Supervisor: Name _____Signature_____

Address: Cell phone +251 (0) 911365200

Email: tassewberhan@gmai.com

Instruction: circle all the possible answers of the respondent from the choice provided.

Annex 3: Questionnaire (English version)

Part one: socio economic /demographic conditions

s.no	Questions	Response
Q101	Age	_____ Years
Q102	Sex	1. Male 2. Female
Q103	Marital status	1.Married 2.Single 3. Widowed 4. separated 5. Divorced
Q104	Educational level	1.Illiterate 2.Can read and write 3.Primaryschool 4.Secondary school 5. technical school 6.College graduate or above
Q105	Occupation	1. Student 2. Self employed 3. Employed 4. Unemployed 5. House wife 9.Other(Specify)_____
Q106	Ethnicity	1. Oromo 2.Amhara 3.Tigre 4.Gurage 5.Other(Specify)_____
Q107	Family size?	_____Members
Q 108	Monthly Income	_____in birr

Part Two: Health Profile Questions

s.no	Questions	Response
Q201	Type of DM	1. Type 1 2. Type 2 3. I don't know
Q202	Duration of DM(write in months if less than 1 year)	_____Years(months)
Q203	Comorbidities	1.Yes 2.No 3. don't know
Q204	Current treatment	1. Insulin injection 2. Oral medication 3. both 4. I don't take medication
Q205	Do you have Family history of diabetes	1.Yes 2.No 3. don't know
Q 206	Have you attended a diabetic education	1. no never 2. Yes sometimes 3. yes regularly
Q207	Are you a member of diabetic association	1. yes 2. no 3. I don't know there is diabetes association.
Q 208	Do you have glucometer at home	1.Yes 2.No 3. No response
Q209	Place of treatment	1. Public health center 2. Private clinic
Q 210	Do you know your recent FBS? (if yes specify)	1.Yes , specify 2.No 3. don't know

Part Three: Diabetic Knowledge Questions

s.no	Questions	Response
Q301	What is diabetes?	1. Diabetes is a raised blood sugar only 2. Diabetes is a disease which affects any part of the body 3. Other specify 4. I don't know
Q302	Identify risk factor for DM	1. Over eating 2. Family history 3. Eating too much fat and sugar 4. Alcohol 5. Cigarette smoking 6. Lack of exercise 7. Other specify 8. I don't know
Q303	Do you know treatment options of DM	1. Injection/Insulin therapy 2. Orally taken tablets 3. Dietary management 4. Exercise 5. Don't know
Q304	Do you know symptom of poorly controlled DM(more than one answer possible)	1. Passing lots of urine 2. Loss of appetite 3. Excess thirst 4. Tiredness 5. Weight loss 6. Don't know
Q305	Identify the complications of DM, if not treated	1. Ophthalmologic 2. Hypoglycemic

		3. Renal 4. Neurologic 5. Don't know 6. No response 7. Specify if other
Q 306	What do you know regarding life style modification?	1. Exercise 2. Dietary modification 3. Weight reduction 4. Don't know 5. No response
Q 307	Do you think control of your blood glucose levels is an important reducing Complication of DM?	1.Yes 2.No 3. Don't know
Q308	Should Diabetes patient measure his or her B/P?	1.Yes 2.No 3. Don't know
Q309	What is your source of information on diabetes self-care?	1. Medical staff 2. Media 3. Relatives and friend 4. Other specify
Q310	How much time does your doctor devote to discuss diabetes when you were first diagnosed?	1. Greater than ten minutes 2. Ten minutes 3. Twenty minutes 4. More than twenty minutes 5. The doctor did not discus 6. I don't remember 7. I don't know
Q311	How much time your doctors devote to you to discuss diabetes during follow up?	1. Less than Five minutes 2. Five minutes 3. Ten minutes

		4. More than ten minutes 5. The doctor does not discus 6. I don't know
Q312	Who diagnosed you first?	1. specialist doctor 2. general practitioner 3. health officer 4. Nurse 5. I don't remember/I don't know
Q313	Does your doctor explain about diet?	1.Yes 2.No 3. I don't know
Q314	Does your doctor explain about exercise?	1.Yes 2. No 3. I don't know
Q315	How would you like this information given to you?	1. Handouts or leaflet 2. Videos or tapes 3. Both no 1 & 2 4. Other (please specify)

PART 4 Treatment Satisfactions

s.no	Questions	Responses				
		Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
Q401	How satisfied are you with the current treatment?	1	2	3	4	5
Q402	How satisfied are you with the treatment convenience?	1	2	3	4	5
Q403	How satisfactory have you found your recent treatment time flexibility?	1	2	3	4	5
Q404	How satisfied are you with your current understanding of diabetes?	1	2	3	4	5
Q405	How satisfied are you to recommend your kind of treatment to someone else with your kind of diabetes?	1	2	3	4	5
Q406	How satisfied are you to continue with your present form of treatment?	1	2	3	4	5

Part 5: Diabetes health belief

s.no	Questions	strongly disagree	disagree	undecided	agree	Strongly agree
Q501	**Perceived susceptibility Diabetic complications**					
	My diabetes is well controlled	1	2	3	4	5
	My diabetes would be worse of if I did nothing about it	1	2	3	4	5
	I believe my diet(medication) will help prevent diseases	1	2	3	4	5
	Diabetes can be serious disease if u don't control it	1	2	3	4	5
Q502	**Perceived severity**					
	My diabetes is no problem to me as long as I feel all right	1	2	3	4	5
	My diabetes will have a bad effect on my health	1	2	3	4	5
	My diabetes will cause me to be sick a lot	1	2	3	4	5
	I believe I will always need my diabetes diet(Medication)	1	2	3	4	5
Q503	**Perceived benefit**					
	I believe I can control my diabetes	1	2	3	4	5
	I believe that my diet (medication) will control my	1	2	3	4	5

	diabetes					
	If I change my eating habit it will probably help me	1	2	3	4	5
	The diabetes medicine(diet) make me feel better	1	2	3	4	5
Q504	**Perceived Barriers**					
	I would change too many habits to follow my diet (medication)	1	2	3	4	5
	It has been difficult what the doctor told prescribed for me about diet	1	2	3	4	5
	I cannot understand what my doctor told me about my diet.	1	2	3	4	5
	Taking medication(following the recommended life style) interferes with my normal daily activities	1	2	3	4	5

PART 6; Self-Care Practice

s.no	Questions	Response
Q601	When was your B/P checked last?	1. Within a week 2. Within one month 3. Two month ago/three months 4. Six month ago
Q602	When was your last visit with your physicians?	1. One week ago 2. Within One month 3. Two month ago/three months 4. Six month ago
Q 603	When was your last Blood Sugar checked?	1. Within a week 2. Within one month 3. Two month ago 4. Six month ago
Q 604	Follow a dietary modification?	1. Yes, many times 2. No, never 3. Yes, occasionally
Q 605	Have you participated in a regular exercise in the past?	1. Yes, many times 2. No, never 3. Yes, occasionally
Q 506	When was your last eye examination?	1. Within one month 2. Six month ago 3. Within one year 4. One years ago 5. Two years ago 6. Note done at all
Q607	When did you last check your feet?	1. Every day 2. Within one week 3. Two months or above ago 4. I never check
Q608	How many days in the past 7 days have you forgotten your diabetic medication?	1. I never forget 2. One day/two days 3. Three days 4. Four days 5. More than five days 6. I don't have medication

Annex 4: Amharic version subject information sheet

<u>አዲስ አበባ ዩኒቨርስቲ</u>

<u>ህብረተሰብ ጤና ሳይንስ</u>

<u>የተጠያቂው / መላሾች የመረጃ ቅፅ</u>

እንደምን አደሩ / ዋሉ ፡፡ ስሜ ---------- ይባላል:: ከዚህ የመጣሁት የአዲስ አበባ ዩንበቨርስቲ ህብረተሰብ ሳይንስ ጤና ሁለተኛ ዲግሪ ተማሪ የሆነችውን ብርሃን ጣሰውን ወክዬ ነው፡፡ ሁለተኛ ዲግሪዋን ለመመረቅ የግል ጤና አጠባበቅ ልምድና ተያያዥ ወሳኝ ጉዳዮችን በተመለከተ በአዲስ አበባ ከተማ የመንግስት ጤና ጣቢያ እንዲሁም የግል ክኒሊኮች ላይ የስኳር ህመም ከትትል በሚያደርጉ ግለሰቦች ሲሆን ከአዲስ አበባ ዩኒቨርስቲ እና ከአዲስ አበባ ጤና ቢሮ ፍቃድ አግኝታ ምርምር ጥናት እየሰራች ነው፡፡

እርስዎ የተመረጡት በዚህ ተቋም የስኳር ህመም ክትትል በማድረግ ላይ ስለሚገኙ ነው፡፡ በአጠቃላይ እድሜያቸው ከ 15 አመት በላይ የሆኑ ስኳር ህመምተኞች ይሳተፋሉ፡፡ የእርስዎ ተሳትፎ ሙሉ በሙሉ የእርስዎ ፈቃደኝነት ላይ ተመሰረተና በጥናቱ መሳተፍ ያለመሳተፍ መብት አለዎት፡፡ ለመሳተፍ ፈቃደኛ ከሆኑ በኋላም በፈለጉት ጊዜ ማቋረጥ ወይም ማቆም ይችላሉ፡፡ በጥናቱ ባለመሳተፍዎ የሚደርስብዎ ጉዳት የለም፡፡

በጥናቱ ለመሳተፍ ከተስማሙ ስለራሰዎ የግል ጤና አጠባበቅ ልምድ እስከ 20 ደቂቃ ሊወስድ የሚችሉ የተወሰኑ ጥያቄዎች እንጠይቆታለን፡፡

ከጥናቱ ተገቢውን የስኳር ህመም የግል ጤና አጠባበቅ ልምድዎን እንዴት ማሻሻል እንዳለብዎ ይረዳሉ፡፡ ከዚህም በተጨማሪ የጥናቱ ውጤት የስኳር ህመምተኞች የግል ጤና አጠባበቅ ልምድ ይበልጥ ለማሻሻል ለሌሎች ተመራማሪዎች በዚህ ዙሪያ ለሚሰሩ አካላት እንደመነሻ ያገለግላል፡፡

ለማንኛውም አይነት ጥያቄ ዋና አጥኚውን ማነጋገር ይችላሉ፡፡ **ሞባይል፡** 09 11365200

Annex 5: Amharic version subject informed consent form

የስምምነት መጠየቂያ/ማረጋገጫ ቅፅ

ከላይ በሰጠሆዎት መረጃ መሰረት በዚህ ጥናት ለመሳተፍ ፈቃደኛ ነዎት 1) አዎ(ቃለ መጠይቁን ቀጥል)

2) አይደለሁም(ምክንያቱን ፅፈህ ወደሚቀጥለዉ ተሳታፊ እለፍ)

መላሽ/ተሳታፊ

ፊርማ _____ቀን _____

ጠያቂ

ስም _____ ፊርማ _____

የመጠይቁ ቁጥር_____

መጠይቁ የተካሄደበት ቀን _____መጠይቁ የተጀመረበት ሰአት _____ መጠይቁ የተጠናቀቀበት ሰአት _____

የቃለ መጠይቁ ዉጤት 1) ሙሉ በሙሉ የተሞላ 2)በከፊል የተሞላ 3) ምንም ያልተሞላ

በተቆጣጣሪዎች ተረጋግጧል ::ስም _____ፊርማ _____

ለማንኛውም አይነት ጥያቄ ዋና አጥኚውን ማነጋገር ይችላሉ:: ሞባይል: 0911365200

ትእዛዝ ፤ተሳታፊዎቹ የሚሰጡትን ማንኛዉንም መልስ ከተሰጡት አማራጮች ዉስጥ ለይተህ አክብብ.

Annex 6: Questionnaire (Amharic version)

ክፍል አንድ፡ማህበራዊና ኢኮኖሚያዊ ሁኔታ

ተ.ቁ	ጥያቄዎች	አማራጭ መልሶች
101	እድሜ	---------- ዓመት
102	ጸታ	1. ወንድ 2. ሴት
103	የጋብቻሁኔታ	1. ያገባ/ያገባች 2. ያላገባ/ያላገባች 3. ባል የሞትባት/ሚስት የሞተችበት 4. የተለያየ/የተለያየች(ግን የልተፋቱ) 5. የተፋታ/የተፋታች
104	የትምህርት ደረጃ	1. መፃፍና ማንበብ የማይችሉ 2. መፃፍና ማንበብ የሚችሉ 3. አንደኛ ደረጃ 4. ሁለተኛ ደረጃ 5. ሰርትፊኬት 6. ኮልጅ/ዩንቨርስቲና ከዚያ በላይ
105	የስራሁኔታ(ከአንድ በላይ መልስ መስጠት ይቻላል)	1. ተማሪ 2. የግል ስራ 3. የመንግስት ስራተኛ 4. ስራ የሌለው 5. ቤት እመቤት 6. ሌላ ካለይጠቀስ----
106	ብሄርዎ ምንድንው?	1. ኦሮሞ 2. አማራ 3. ትግሬ 4. ጉራጌ 5. ሌላካለይጠቀስ
107	የቤተሰብ ብዛ	_____አባላት
108	የቤተሰብዎ ወርሃዊ ገቢ ምን ያህል ነው?	_____ብር

ክፍል ሁለት፡ጤናን የተመለከቱ ጥያቄዎች

ተ.ቁ	ጥያቄዎች	መልሶች
201	የስኳር ህመምዎ ዓይነት?	1.አንደኛው አይነት 2. ሁለተኛአይነት 3. አላውቅም
202	የስኳርህመምዎ ምን ያህል አመት/ወር ሆነው?	_____አመት/____ወር
203	ከስኳር ህመሙ ሌላ ተጨማሪ በሽታዎች?	1. አዎ 2. የለም
204	በአሁኑ ሰዓት የሚወስዱት የህክምና ዓይነት?	1. በመርፌ የሚሰጥ ኢንሱሊን 2. የሚዋጥ መድሃኒት 3. ሁለቱንም 4. ምንም አልውስድም
205	በቤተሰብ ውስጥ በህክምና የተረጋገጠ የስኳር በሽታ ያለበት አለን?	1. አዎ 2. የለም
206	ስለስኳር ህመም ትምህርት ተከታትለው ያውቃሉ?	1. አላውቅም 2. አንዳንዴ 3.ሁል ጊዜ
207	የስኳር ህመምተኞች ማህበር አባልነዎትን?	1. አዎ 2. አይደለሁም 3. እንዳለ አላውቅም
208	የስኳር መለኪያ በቤት ውስጥ አለዎትን?	1. አዎ 2. የለኝም
209	የህክምና ቦታ	1. የመንግስት ጤና ጣቢያ 2. የግል ክሊኒክ
210	አሁን ያለው የስኳር መጠንዎ ያውቃሉን?	1. አላውቅም 2. አዎ፣ስንት ነው? _____

ክፍልሶስት፡የስኳር ህመም እውቀት መለኪያ ጥያቄዎች

ተ.ቁ	ጥያቄዎች	መልሶች
301	የስኳር ህመም ምንድነው?	1. በደም ውስጥ ያለው ስኳር ፍማለት ብቻ ነወ 2. የስኳር በሽታ ማንኛውም የሰውነት ክፍል የሚነዳ በሽታነው 3. ሌላ ካለ ይጠቀስ---- 4. አላውቅም
302	ከሚከተሉት ውስጥ ለስኳር በሽታ የሚጋልጠው የቱ ነው? (ከአንድ በላይ መልስ ይቻላል)	1. ከመጠን በላይ መመገብ 2. በዘር 3. ብዙ ቅባትና ስኳር መመገብ 4. አልኮል 5. ሲጋራ ማጨስ 6. ሌላ ካለ ይጠቀስ---- 7. አላውቅም
303	ከሚከተሉት ውስጥ ለስኳር ህመም የህክምና አማራጮች ሊሆኑ የሚችለው የትኛው ነው? (ከአንድ በላይ መልስ መስጠት ይቻላል)	1. በመርፌ የሚሰጥ ኢንሱሊን 2. የሚዋጥ መድሃኒቶች 3. አመጋገብን በማስተካከል 4. የአካልብቃት እንቅስቃሴዎችን 5. ሌላ ካለ ይጠቀስ---- 6. አላውቅም
304	በቁጥጥር ስር ያልሆነ የስኳር ህመም ምልክቶችን ይጥቀሱ? (ከአንድ በላይ መልስ መስጠት ይቻላል)	1. ብዙ መሽናት 2. የምግብ ፍላጎት መቀነስ 3. ከመጠን ያለፈ የውሃ ጥም 4. ድካም 5. የክብደት መቀነስ 6. አላውቅም
305	የስኳር ህመም በአግባቡ ካልታከመ የሚያስከትላቸው ጉዳቶች የትኞቹ ናቸው?	1. የዓይን ጉዳት 2. የደም ውስጥ የስኳር ማነስ 3. የኩላሊት እና የነርቭ ጉዳት 4. አላውቅም
306	የስኳር ህመም ንለመከላከል የሚጠቅሙ የአኗኗር ዘይቤ ለውጥ የቱን ያውቃሉ?	1. የአካል ብቃት እንቅስቃሴ 2. የአመጋገብ ለውጥ 3. ክብደትን መቀነስ 4. አላውቅም
307	በደም ውስጥ ያለውን የስኳር መጠን መቆጣጠር ስኳር ህመም የሚያስከትልውን ጉዳት ይቀንሳልን?	1. አዎ 2. አይደለም 3. አላውቅም
308	የስኳር ህመምተኛ የደም ግፊቱን መለካት እንዳለበት ያውቃሉን?	1. አዎ 2. አይደለም 3. አላውቅም
309	የስኳር በሽታን በተመለከተ መረጃን ከየት አገኙ/ያገኛሉ?	1. ከጤና ባለሙያዎች 2. ከሚዲያ 3. ከጓደኛና ቤተሰብ
310	በሐኪምዎ ለመጀመርያ ጊዜ ስለስኳር ህመም ለምን ያህል ጊዜ ተወያዩ?	1. 10 ደቂቃ 2. >10 ደቂቃ 3. 20 ደቂቃ 4. >20 ደቂቃ 6.አላስታውስም 5. አልተወያዩም 7. አላውቅም
311	በየክትትልዎ ሃኪምዎ ከእርስዎ ጋር ስለስኳር ህመም ለምን ያህል ጊዜ ይወያያሉ?	1. <5 ደቂቃ 2. 5 ደቂቃ 3. 10 ደቂቃ 4. >10 ደቂቃ 5. አልተወያዩም 6. አላውቅም
312	የስኳር ህመም እንዳለብዎት መጀመርያ ያገኝዎ የጤና ባለሙያ ማረግ ምንድነው?	1. ስፔሻሊስት ዶክተር 2. ዶክተር 3. የጤና መኮንን 4. ነርስ 5. አላስታውስም/አላውቅም
313	ሃኪምዎ ስለአመጋገብ ገለፃ አድርጎሎታል?	1. አዎ 2. አይደለም 3. አላውቅም

314	ሃኪምዎ ስለአካል ብቃት እንቅሰቃሴ ገለፃ አድርጎለዎታል?	1. አዎ 2. አይደለም 3. አላውቅም
315	የስኳር ህመምን የተመለከቱ መረጃዎችን በምንአይነት መልኩ ቢደርስዎ / ቢቀርብሎ ይመርጣሉ?	1. በበራሪ ወረቀት 2. ቴሌቭዥን/ሬዲዮ 3. ሌላ ካለ ይጠቀስ---- 4.አላውቅም

ክፍልአራት፡የስኳርህመምህክምናአገልግሎትእርካታንየተመለከቱጥያቄዎች

ተ.ቁ	ጥያቄዎች	አማራጭመልሶች				
		ሙሉ በሙሉ አላስደሰተኝም	አላስደሰተኝም	አስደስቶኛል	በጣም አስደስቶኛል	ሙሉበሙሉ አስደስቶኛል
401	አሁን እየተሰጠ ባለው የህክምና አገልግሎታት ምንያህል ደስተኛነዎት?	1	2	3	4	5
402	የህክምና ቦታ ለመድረስ ባለው እርቀት ምን ያህል ደስተኛነዎት?	1	2	3	4	5
403	የስኳር ህመም የህክምና አገልግሎት የሚሰጥበት ሰዓትምን ያህል ደስተኛ ነዎት	1	2	3	4	5
404	ኡሁን ባለዎት የስኳር ህመም ግንዛቤ ምን ደስያህል ደስተኛ ነዎት?	1	2	3	4	5
405	እርሶ የሚወሰዱትን ህክምና ለሌላ ተመሳሳይ የስኳር ህመምተኛ ለመምከር ምን ያህል ደስተኛ ነዎት ?	1	2	3	4	5
406	አሁን እየወሰዱት ባለው ህክምና ለመቀጠልያህል ደስተኛ ነዎት ?	1	2	3	4	5

ክፍል አምስት፡ የስኳር በሽታ ጤና አተባበቅ አስተሳሰብ

ተ.ቁ	ጥያቄዎች	መልሶች				
		ፍጹም አልስማማም	አልስማማም	አላውቅም	እስማማለሁ	በጣም እስማማለሁ
501	**የስኳር ህመም ችግሮች የተተቂነት ስሜት**					
	የስኳር ህመሜ በቁጥጥሬ ስር ነው	1	2	3	4	5
	ምንም ባላድርግ የስኳር በሽታየ ይብሳል	1	2	3	4	5
	የስኳር ህመሜ ከአመጋገብ ስርአቴ (መድሃኒቴ) በሽታ ይከላከላል	1	2	3	4	5
	የስኳር ህመም በቁጥጥር ስር ካልሆነ አደገኛ ነው	1	2	3	4	5
502	**የስኳርህመምአደገኝነትስሜት**					
	ካልታመምኩ የስኳር በሽታየ ችግር የለውም	1	2	3	4	5
	የስኳር ህመም በጤና ላይ ጉዳት አያመጣም	1	2	3	4	5
	የስኳር ህመሜ በብዛት እንድታምም ያደርገኛል	1	2	3	4	5
	የስኳር ህመም የአመጋገብ ስርአቴ (መድሃኒቴ) ሁልጊዜ ያስፈልገኛል	1	2	3	4	5
503	**የስኳር ህመም ራስ አጠባበቅ ጠቀሜታ ስሜት**					
	የስኳር ህመሜን መቆጣጠር እችላለሁ	1	2	3	4	5
	በአመጋገብ ስርአቴ (መድሃኒቴ) የስኳር ህመሜን መቆጣጠር እችላለሁ	1	2	3	4	5
	የአመጋገብ ልምዴን መቀየር ሊጠቅመኝ ይችላል	1	2	3	4	5
	የስኳር መድሃኒቴ እንዳልታመም እየረዳኝ ነው	1	2	3	4	5
504	**የስኳር ህመም ራስ አጠባበቅ መሰናክሎች**					
	ብችል ብዙ የአመጋገብ ልምዴን(የመድሃኒት አወሳሰዴን) መቀየር ይፊልጋለሁ	1	2	3	4	5
	ሀኪም ያዘዘልኝን የአመጋገብ ስርአት መከታተል ይከብደኛል	1	2	3	4	5
	ሀኪም ስለአመጋገብ ስርአት የነገረኝ አልገባገንም	1	2	3	4	5
	የስኳር መድሃኒቴን መውሰድ ከለተቀን እንቅስቃሴየ ጋር ይጋጫል	1	2	3	4	5

ክፍል ስድስት፡ የግል ጤና አጠባበቅ ልምድ

ተ.ቁ	ጥያቄ	መልስ
601	ለመጨረሻ ጊዜ ደመዎን የተለኩት መቼነው?	1. በሳምንት ውስጥ 2. በአንድ ወር ውስጥ 3. ከሁለት/ሶስት ወር በፊት 4. ከስድስት ወር በፊት
602	ለመጨረሻ ጊዜ ለክትትል የሄዱት መቼ ነበር?	1. ከአንድ ሳምንት በፊት 2. በወር ውስጥ 3. ከ2/3 ወር በፊት 4. ከ 6 ወር በፊት
603	ስኳርዎን ለመጨረሻ ጊዜ የተለኩት መቼነው?	1. ከአንድ ሳምንት በፊት 2. በወር ውስጥ 3. ከ2 ወር በፊት 4. ከ 6 ወር በፊት
604	የተሰጠዎን የአመጋገብ ስርአት ይከታተላሉ?	1. አዎ ሁልጊዜ 2. ተከታትዬ አላውቅም 3. አዎ አንዳንዴ
605	የአካል ብቃት እንቅስቃሴ አድርገው ያውቃሉ?	1. አዎ ሁልጊዜ 2. አድርጌ አላውቀም 3. አዎ አንዳንዴ
606	ለመጨረሻ ጊዜ አይንዎን የታዩት መቼነው?	1. በወር ውስጥ 2. ከ6 ወር በፊት 3. ከአንድ አመት በፊት 4. 2 አመት በፊት 5. ታይቼ አላውቅም
607	ለመጨረሻ ጊዜ እግርዎን ያዩት መቼነው?	1. በየቀኑ 2. በሳምንት ውስጥ 3. ከሁለት ወር በፊት 4. አይቼው አላውቅም
608	ባሳለፍነው ሳምንት ስንት ቀን መድኀኒት እረስትው ያውቃሉን?	1. አልረሳሁም 2. አንድ ጊዜ 3. ስምስት ጊዜ 4. አራት ጊዜ 5. ከአምስት ቀን ብላይ 6. መድሃኒት አልወስድም

Annex 7:Curriculum Vitae

1. Personal information

- First name **Berhan**
- Last name Tassew
- Sex Female
- Date of birth 02/02/1990
- Marital status Single
- Citizenship Ethiopian

2. Contact Address

- Telephone (residence) +251116390083
- Mobile phone +251(0)911365200
- Email address tassewberhan@gmail.com
- Country of residence Ethiopia
- City/Town Addis Ababa

3. Summary of qualification

- I have BSc degree in Public health science from Haromaya University faculty of Health Science,

4. Education

Years	Grade	Institutions
1996-1998 G.C	1-3	S.O.S Herman Gemayner school, Mekelle, Ethiopia
1999-2005 G.C	4-9	Bright Future School, Addis Ababa, Ethiopia
2006-2009 G.C	9-12	Nativity Girls School, Addis Ababa, Ethiopia

- **University**

Award	**Institution**	**Field of study**	**Year of graduation**
BSc degree	Haromaya University Ethiopia	Public health science	2013
MPH	Addis Ababa University	Master of public health	On going

2. Languages

Language	**Level**		
	Speaking	**Reading**	**Writing**
Amharic	Excellent	Excellent	Excellent
English	Excellent	Excellent	Excellent
Tigrigna	Excellent	Very good	Very good

6. **Reference**

1. Anteneh Dirar(BSc, MSc)

Head of public health officers

Haromaya University

2. Abraham Geremew (BSc, MSc)

Lecturer, community based practical education coordinator

Collage of health and medical science

Haromaya University

Annex 8: Assurance of principal investigator

DECLARATION

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in this or any other university and that all sources of materials used for this thesis has been duly acknowledged .

Name of the student: **Berhan Tassew Woldehanna**

Signature: _____

Place : Addis Ababa

Date of submission: _____

This thesis has been submitted for examination with my approval as a University advisor

Name: Demeke Assefa(MD,MA)

Signature: _____