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COLLEGE OF HEALTH SCIENCES

SCHOOL OF NURSING AND MIDWIFERY

DEPARTMENT OF NURSING

PROGRAM OF POST GRADUATE STUDY

ASSESSMENT OF GLYCEMIC CONTROL AND SELF-CARE PRACTICE AMONG ADULT PATIENTS WITH DIABETES MELLITUS IN TERCHA GENERAL HOSPITAL, DAWRO ZONE, SOUTHERN NATION NATIONALITIES AND PEOPLES REGION; ETHIOPIA.

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APPROVAL SHEET

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I, the undersigned MSc student, declare that I have submitted my original work on a title assessment of glycemic control and self-care Practice among adult Patients with diabetes mellitus in Tercha General Hospital, Dawro Zone, Southern Nation Nationalities and Peoples Region; Ethiopia for the examination.

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STATEMENT OF THE AUTHOR DECLARATION

By my signature below, I declare and affirm that this thesis is my own work. I have followed all ethical principles of research in the preparation, data collection, data analysis and completion of this thesis. All scholarly matter that is included in the thesis has been given recognition through citation. I affirm that I have cited and referenced all sources used in this document. Every effort has been made to avoid plagiarism in the preparation of this thesis.

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BIOGRAPHICAL SKETCH

My registration Name is Bizuayehu Atinafu Ataro(HG). I was born in December 1, 1995 at Jimma City, Oromia national region, Ethiopia but; my development and parents birth place were belongs to Dawro Zone, Southern Nations Nationalities and peoples region, Ethiopia. I have addressed Aduwa primary school in Tocha Woreda, Modeli and Melesteyna primary school in Mareka Woreda, Soduwa first and second cycle school in Tercha town with in Dawro Zone throughout my primary education period but; I was completed my primary education in Gozo Bamushi first and second cycle school and secondary education in Waka senior secondary and preparatory school; Mareka Woreda, Dawro Zone, SNNPR, Ethiopia. I started my accadamical carrier by taking Diploma honor in clinical nursing from Arba Minch College of health science and then I was graduated on Post Basic BSc Nursing from Hawassa College of health science. I have three year clinical experience in Gendo and Mari health center at Mareka Woreda, Dawro Zone, SNNPR, Ethiopia and three month accadamical experience in Wolayta Sodo University.

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LISTS OF ACRONYMS AND ABBREVIATIONS

AAU:	Addis Ababa University
AOR:	Adjusted Odd Ratio
BMI:	Body Mass Index
CI:	Confidence interval
DKA:	Diabetic Ketoacidosis
DM:	Diabetes Mellitus
ESRD	End stage renal disease
FBS:	Fasting Blood Sugar
FDRE:	Federal Democratic Republic of Ethiopia
HbA1C:	Glaciated Hemoglobin
IFD:	International Diabetes Federation
MOH:	Ministry of Health
NGOS:	None Governmental Organizations
PI:	Principal Investigator
PMO:	Office of prime minister
SMBG:	Self-Monitoring of Blood Glucose
SNNPR:	Southern Nation, Nationalities, and Peoples Region

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ABSTRACT

According to WHO Global report, in low-income countries more than half of deaths attributable to poor glycemic control are premature. Studies compassed, prevalence of poor self-care practice and glycemic control is by now in tip of iceberg above diabetes by becoming primary offender for fired morbidity and mortality but; are neglected tragedy. Currently diabetes patients are exposed to intolerable cost of dialysis and organ transplantation because of poor glycemic control and self-care practice induced complications; which in turn increased beggar population and prevalence of suicidal attempt. Studies underlined, optimum self-care practice is needed to avert these complications via adjusting glycemic control status. However, only a minute of relevant studies were conducted in Ethiopia to assess this problem.The aim of this study was to assess glycemic control and self-care practice among diabetes patient in Dawro Tercha General Hospital. Cross-sectional study was conducted from March 07-April 10/2020 in Tercha general hospital among 220 participants selected by systematic sampling technique. Logistic regression analysis was carried out to identify independent predictors.

Status of self-care practice and glycemic control became good for 24.9% and 23% respectively. Age, diabetes complication, medication adherence, glucometer and appointment adherence were nominated in shortlist of independent predictor for glycemic control; whereas education, diabetes complication, diabetes category, distance and appointment adherence became independent predictors for overall self-care practice. Furthermore, presence of significant association between glycemic control and self-care practice was assured. Status of good glycemic control and self-care practice were shine red lump, since it indicates majorities of the patients were closed to face premature death and permanent disabilities. Association between glycemic control and self-care practice on the other hand uncovered presence of non-pharmacological intervention under question, and further brightened the need of maximum effort to enhance self-care practice to ease roads to good glycemic control and finally to save diabetes patients from the coming fatal consequences.Responsible bodies have to work hard to raise the coverage of hospital or to enhance material capacity of available primary hospitals to enable them to serve diabetes follow up patients, since all patients in the whole zone in this study area served by only one hospital. Health education team has to be formed to provide problem solving-centered education supported by Audio visual aids.

Key words: Glycemic control, self-care practice, prevalence, diabetes

CHAPTER ONE: INTRODUCTION

1.1. Background

Diabetes mellitus is a group of metabolic disorder characterized by elevation on the level of glucose in the blood with alteration in carbohydrate, fat and protein metabolism secondary to defects in insulin synthesis, insulin action, or both and chronic disorder accompanied by variety of comorbidities and dis abilities with negative impact on productivity of individuals, in turn family, society and the whole country[1].The three most common forms of diabetes mellitus are Type 1, Type 2 and Gestational diabetes. The first goal of diabetes treatment is to keep the blood glucose levels in nearly normal range (70 to 126 mg/dl) before meal or <140 mg/dl 2 hours after food or HbA1c is less than 7% [1, 2].

World Health Organization estimated that, the number of people with diabetes grew by nearly 300% from 1980 to 2014, to 422 million worldwide. That number is also predicted to rise, to 642 million people living with diabetes worldwide by 2040. The estimates further assured that, the consequences of uncontrolled blood sugar can be severe and high blood sugar levels can leads to heart disease, stroke, blindness, kidney failure, and amputation of toes, feet, or legs. Diabetes is the leading cause of kidney failure, lower-limb amputations, and adult-onset blindness which is almost always linked to poor glycemic control and sub optimal practice of self-care; [3].

Studies suggests that, poor glycemic control is responsible for 35% retinopathy, 80% ESRD, 10 to 20 times and higher lower limb amputation rates and 3.7 million additional deaths._Interventions that promote healthy diet, physical activity, weight loss self-care practice domains are cost-effective, lies at the heart of improving diabetes outcomes and corner stone to combat diabetes induced morbidity and mortality [4].

Glycemic control remains the major therapeutic objective for prevention of target organ damage and other complications arising from diabetes. Yet the practice has been still very poor and this has made the outcomes of disease worst by posing diabetes patients to premature death and permanent disabilities. In India and Saud Arabia, majority of diabetic patients (91.8% and 75%) respectively didn't controlled their blood glucose, they have central obesity and are poor in dietary management self-care practice domain. The study concluded that, these patients were paid costs of acute and long-term complication including death [5, 6].

Poor prevalence of self-care practice and glycemic control by now in tip of iceberg above diabetes by becoming primary offender for fired morbidity and mortality rate but, are neglected tragedy. In Nigeria, Prevalence of good glycemic control and self-care practice were 40.6% and 26.8% respectively.

In Sudan, 80.0% of diabetes patient didn't controlled their blood glucose; whereas in Cameroon and Guinea, 74% of diabetes patients have poor glycemic control and are exposed to premature death, amputation, blindness and expensive intervention such as dialysis and organ transplantation. The studies further recommended, optimal self-care practice needed to improve glycemic status to avert deaths related to diabetes complications [7, 8, 44].

IDF reported Ethiopia to be ranked 3rd in Africa with 1.4 million diabetes patients and 4.36% extrapolated prevalence. A large numbers of population (1.39 million) are remain undiagnosed and from them, about 1.3 million are adults [9, 10]. Regardless increment in number health professional and health institution in recent year, still complication from diabetes has been extremely high; which is almost always linked to poor self-care practice and suboptimal glycemic control in clinical practice [11].

In diabetes management, self-care practice is backbone to achieve healthy productive life, tackle diabetes related morbidity and mortality, associated with; improved glycemic control, decrement in unnecessary healthcare costs and improved quality of life [12]. Since diabetes is becoming a serious public health problem, it requires the patients' self-management and glycemic control; which can be developed from a thorough under-standing of management challenges [14, 15].

1.2. Problem statement

As there is no cure for diabetes, glycemic control with effective self-care practice is the only activities without extra option to prevent and control its disfiguring and life threatening outcomes. Yet Glycemic control and self-care practice has been still didn't achieved by diabetes patients worldwide and become global concern by its burden. In Sri Lanka, ,outnumbered adults did not achieved desired glycemic control and standardized self-management strategies including withholding refine sugar, regular exercises and routine monitoring of glucose [16].

According to WHO Global report, poor glycemic control resulted 3.7 million extra mortality by increasing the risks of cardiovascular and other comorbidities. Singapore diabetes Statistics bureau announced that, among diabetics who were aware of their disease; one in three had poor glycemic control and are suffered from disabilities and premature death. In India; one-third of the study population had micro vascular complications, predominantly neuropathy and retinopathy because of uncontrolled glaciated hemoglobin. A study highlighted the need for early implementation of optimum Self-care practice in addition to diabetes pharmacotherapy to maintain recommended glycemic control and to prevent micro vascular complication [17, 18, 19].

Consequences of poor glycemic control and self-care practice resulted a huge health challenge, negatively affected global economy and labor markets. Most patients cannot afford the most expensive procedures such as dialysis and organ transplantation performed for poor self-care practice and glycemic control induced complications. This increased beggar population and prevalence of suicidal attempt. In low-and middle-income countries, above 352 million have impaired glucose tolerance, which has increased the risk of developing cardiovascular diseases, stroke, ESRD, foot ulcer, visual impairment and nerve damage [1, 9, 20, 21, 22, 23].

Diabetes reduce lifespan more than 10–15 years and ranked among medical conditions end up with rapid admission, which has been almost always linked to poor glycemic control and self-care practice. According to WHO Global report in low-income countries, more than half of deaths attributable to high blood glucose are premature. In contrast in high-income countries, about one-fifth of deaths are premature. The gap in prevalence of death from poor glycemic control is probably the result of poorer self-care practice in low-income countries [10, 17, 24].

Evidence from contemporary studies note that; self-care focused interventions have good outcome on diabetes by reducing morbidity and mortality, whereas tight glycemic control is cornerstone to combat almost all squeal. Therefore, there is a need of well-organized program for attainment of optimal glycemic control and self-care practice; since adherence to these behaviors currently has been found minimum and in particular blood glucose control domain was very poor [25].

According to a minute of available studies in Ethiopia, attainment of therapeutic glycemic control and self-care practice is challenge for health care providers and health care system. More than 50% of adult diabetes patient did not perform self-monitoring of blood glucose even a single day, which makes them to come with highest blood glucose level during follow up visit and posed them for serious complication [26, 27].

American diabetes association publishes standards of medical care yearly to promote the importance of achieving optimal glycemic control but, the expected objective was not achieved and the problem becomes serious issue. A minute of available studies conclusion indicated urgent need for improving self-care practice and glycemic control, therefore keeping in mind the need of adopting healthy life style via optimal self-care practice and glycemic control is mandatory to minimize the cost of treatment and progression of disease process in to complication [1].

Maintenance of nearly-normal glycemic control has been demonstrated to reduce the risk of diabetic associated morbidity and mortality, whereas self-care practice is crucial to maintain near-normal glycemic control [28, 29]. Yet there is a serious shortage of study especially in sub Saharan Africa regarding association between glycemic control and self-care practice, hence it is important to consider further study to be parts of solution to fill these gap.

CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

Poor glycemic control has been linked to diabetes related squeal such as blindness, kidney failure, heart attacks, stroke and lower limb amputation. In 2016, 2.2 million deaths were attributable to high blood glucose and from them, half of all deaths occur before the age of 70 years. Diabetes itself not problematic rather, its complication secondary to poor glycemic control and Self-care practice makes it the most life threatening and disabling disorder. Diabetes can be treated and its consequences avoided or delayed through tight glycemic control and optimal self-care practice [10, 20].

2.2. Status of glycemic control

Few available studies revealed that, Glycemic control is the first and only solution to combat the consequences of diabetes; yet the status of glycemic control is still in question and below standard regardless increasingly emerging health institution and professionals. Study conducted in Pakistan had pointed that, Good glycemic control was observed in only 17% of the study participants. The study conducted in Sri Lanka typically indicated global severity of glycemic control status; out of 300 subjects, majorities (75.7%) were demonstrated poor glycemic control. However, South Koreans (45%) and Malaysians (32.8%) were relatively better controlled their blood glucose. These gap in prevalence was an output of meeting demand of stock necessary for attaining glycemic control, problem solving centered health information dissemination supported by technologies and presence of transformed health development army [29, 30, 47, 48].

Another study conducted in Brazil has assured that, overall prevalence of inadequate glycemic control was 76%. Similarly according to study conducted in Saudi Arabia, 75% of diabetic patient had poor glycemic control. Yet the study conducted in India come with partly contrary finding regarding glycemic control status, 64% of the respondents had achieved good glycemic control status. Which was contrary with another study conducted in India, nearly 76.6% of the patients had uncontrolled blood glucose [6, 19, 31, 47].

In Africa region, the way diabetes patients are going to control their blood glucose have been still under question. A study conducted in Ghana has revealed that, 70% of diabetes patient had poor glycemic control and in North East and South West Nigeria, 49.9% and 40.6% were better controlled their blood glucose. Available studies further underlined that, since prevalence of poor glycemic control was extremely high, which was supported by the finding reported from several underdaveloped countries; it is better to have multi-disciplinary and integrated effort toward the gap [43, 44, 46].

2.3. Factors associated with glycemic control

A study conducted in Malaysia indicated, age has association with glycemic control p-value 0.009. Whereas a study conducted in Oman on the other hand come with conclusion; factors that increase prevalence of good glycemic control are younger age, female, secondary education, short duration of diabetes, and small waist-hip ratio. A retrospective study conducted at Gombe hospital in North East Nigeria on the other hand came with a finding; the respondents who were married 4.816 (1.486 – 15.610) and educated 1.666 (0.970 - 2.862) had more likely good glycemic control compared to general population [46, 48, 49].

Diabetes related factors includes duration of diabetes, family history of diabetes, fasting blood sugar value, body mass index, glucometer accessibility, diabetes category, diabetes complication, diabetes medication, presence of comorbidities and are among the most neglected variables by investigators on the area of glycemic control and self-care practice of them, category of diabetes was showed signfican association. A study conducted in Brazil claimed that, the rates of inadequate glycemic control were higher in patients with type 1 diabetes (90%) than in patients with type 2 diabetes (73%). Among the latter group, participant without insulin in their therapeutic regimen had lower rates of poor glycemic control (64%) than participant using insulin in their treatment regimen (90%) [32].

On the other hand, study conducted in Sudan had assured that, there is no statistically significant association between glycemic control and diabetes related factors such as BMI. Which was strengthened by systematic review and meta-analysis conducted in Ethiopia: there was no difference in glycemic control among type 1 and type 2 diabetic patients [7, 33].

In Ethiopia, a minute of available studies are attempted to identify association between socio demographic factors and glycemic control: Study conducted in Jimma showed that, Illiterate and farmer have poor glycemic control. On the other hand the study attempted to address Self-monitoring of blood glucose and medication adherence to determine whether they affect glycemic control and has showed that, poor medication adherence under adherence status had statistically significant association with poor glycemic control [34]. Self-monitoring of blood glucose can have vital role in maintaining blood glucose in good status; another study conducted again in Jimma claimed that, participants monitored their blood glucose as indicated by health professional better maintained good glycemic control [27].

2.4. Status of self-care practice

Likewise of glycemic control, significance of self-care practice in management of diabetes mellitus and its current status is in parallel way.

A study conducted in Nigeria had confirmed how much the gap was officially addressed the whole Africa region, in which 26.8% only had achieved good self-care practice among Nigerian respondents. The same is true for Ethiopia as parts of African territory, A Study conducted in Bahir Dar and in two population as single study (Harar and Dire Dawa) had declared that; prevalence of self-care practice became poor for 33.2% and 61.9% respectively. Over all available studies agreed and underlined that, universal efforts should be made to close the gap and to improve self-care practices of diabetes patients [15, 35, 44].

2.5. Factors associated with self-care practice

Educational status strongly affects status of self-care practice. A study conducted in Nepal revealed that, from participant 50.4% were male and 49.6% female. Among them, 27% were in the age group below 50 Year, 50.4% were illiterate , 42.6 % were overweight and most of them had duration of disease between 1 to 5 Year. The computed result further declared that, poor self-care practice is associated with age, education level and occupation. A study underlined that, health personnel should have to provide education for people with diabetes to improve their practice of self-care and to have better quality of life. Yet studies conducted in Asia like Iran and Africa region such as Eastern Sudan didn't have significant association on these variables [7, 28, 50].

Regardless of a serious shortage of studies on glycemic control and self-care practice in Ethiopia, a very few related studies attempted to address religion, income status, place of living and declared positive relationship. Study conducted in Tigray had assured that, Muslims, those living in urban areas and earning high income were better achieved optimal self-care practice. Another study conducted in FelegeHiwot had notified that, participants in age group between 18-32Years were 6 times more likely to have good self-care practice compared to individuals who were at the age of 50 years and above and participants who were attained higher education and above had good practice of self-care compared to those who were unable to read and write and, increased level of income also positively associated with good self-care practice [15, 36].

2.6. Association between glycemic control and self-care practice

Dietary management and physical activities self-care domain are among non-pharmacological intervention toward diabetes and are cornerstone to control blood glucose in therapeutic range, whereas foot care domain has been the first and key self-care practice to prevent permanent disabilities following amputation. Yet there is scarcity of relevant studies addressing these factors. Among a very few available document report a study conducted in Sri Lanka has announced that; general diet, physical activity and medication adherence were significantly associated with glycemic control. Whereas study conducted in India and South Korea revealed that, following a controlled diet and regular exercise were significantly associated with optimal achievement of glycemic control and those with poor glycemic control status had significantly lower values for medication adherence self-care practice domain [29, 31, 47].

According to a minute of investigation report in Oman and Africa region, suboptimal self-care practice become challenge and interfered outnumbered patients from achieving sustained maintenance of glycemic control under therapeutic range. According to a study conducted in Oman, poor control in blood glucose was significantly end up with poor achievement in overall self-care activities, similarly Nigerian study was compassed presence of positive association between overall self-care practice and glycemic control. As further extension they had brightened that, respondents with good self-care practice were six times more likely to have good glycemic control than those with poor self-care practice [44, 49].

Similarly according to retrospective study conducted at Gombe hospital in North East Nigeria, Patients who were engaged in moderate physical activity were more likely to have good glycemic control compared to general population; which was strengthened by experimental study conducted among 80 subjects in South-West Nigeria (increasing self-care practices resulted in significant improvement of glycemic control). These studies by far underlined that, Patients' ability to self-manage their health behavior plays a crucial role in diabetes management. Hence, health care providers should include all aspects of self-care practice when treating people with diabetes in order to improve its status, since it has been motor to achieve therapeutic glycemic control status. Yet, this recommendation were argued by the study conducted in Africa region in Guinea and Cameroon the reason behind, absence of significant association between self-care practice and glycemic control [8, 45, 46].

2.7. Summary

Regardless of the available studies that are tried to explore the gap and locate possible suggestion, still the most important variables such as glucometer, distance, BMI, category of diabetes, appointment adherence under self-care practice and glycemic control are not such much addressed. Studies that are identified association between self-care practice and glycemic control are almost rare. Furthermore, studies conducted on glycemic control and self-care practice has been extremely scarce especially in sub Saharan Africa, even few available studies are duplicated in few world countries like India and western Africa from Africa region. In Ethiopia, there is a series shortage of studies on glycemic control and self-care practice when we compare the population number, area of the country, magnitude and severity of the problem.

Hence, it is important to think about studies that address the most important variables such as glucometer, distance, BMI, appointment adherence and identifies association between glycemic control and self-care practice, consider neglected study area such as southern end of Ethiopia as well. Therefore this studies aimed to be parts of the solution to fill identified gap by assessing glycemic control and self-care practice in southern Ethiopia, Dawro zone, Tercha general hospital.

2.8. Justification of the study

Investigating two prevalence (glycemic control and self-care practice) with factors and identifying association between these two prevalence nominates this study the first in Ethiopia and the second in the world in terms of specific objectives, since only Nigerian authors did this. For further extension, regardless of the presence of little reliable study the finding was not changed in to practice and not meet its objective this is why, consistent study needed on the area to reach optimum threshold to resolve the gap.

Despite benefits of glycemic control and engaging in a recommended self-care regimen, there was series shortage of studies especially in sub Saharan Africa and almost extremely scarce in Ethiopia; almost no in Southern parts. Hence the aim of this study was to fill these gap by addressing much variables that are missed by available studies such as glucometer, category of diabetes, BMI, appointment adherence and distance, identifying factors associated with glycemic control with its status, factors associated with self-care practice with its status and determining presence of association between the two independent variable(glycemic control and self-care practice) which have been responded by assessing glycemic control and self-care practice among adult patients with diabetes mellitus in Tercha General hospital, Dawro Zone, SNNPR; Ethiopia. Hospital.

2.9. Significance of the study

The major problematic condition about glycemic control and self-management practices is presence of limited researches in Ethiopia. To address these deficits, this study explores self-care practices and glycemic control.

Stake holders and policy makers might benefited from the finding to develop plan against diabetes squeal and formulate guideline. The study might help health service managers and care providers to identify barriers of glycemic control and self-care practice. It might help diabetes educators to prepare contents with consideration of current evidence. As glycemic control and self-care practice linked to the first major objectives in the treatment of diabetes, this study again might point gap for health care provider in management of diabetes and improve its quality by expanding evidence based practice.

Since this study determines status of glycemic control and self-care practice, diabetes patients might be advantageous regarding identification of their current status, adjustment of their treatment plan and counseling to strengthen positive practices and discourage improper practices. Since no study conducted on the title in this study area, the study might act as an input and stepping stone for researcher to conduct further study to fill knowledge gap. Hence, it is important to find out how diabetes patients in Tercha general hospital control their blood glucose and practice self-care.

2.10. Conceptual frame work

Conceptual frame work was further modified after adoption from different literatures [27, 29, 34, 37, and 38]. It shows the expected effect of independent on dependent variables and predicted association between the two dependent variables. For further extension, black arrow indicates diabetes related clinical factors and socio demographic factors are expected to affect both of dependent variables, whereas blue arrow indicates presence of expected relationship between the two dependent variables (self-care practice and glycemic control).

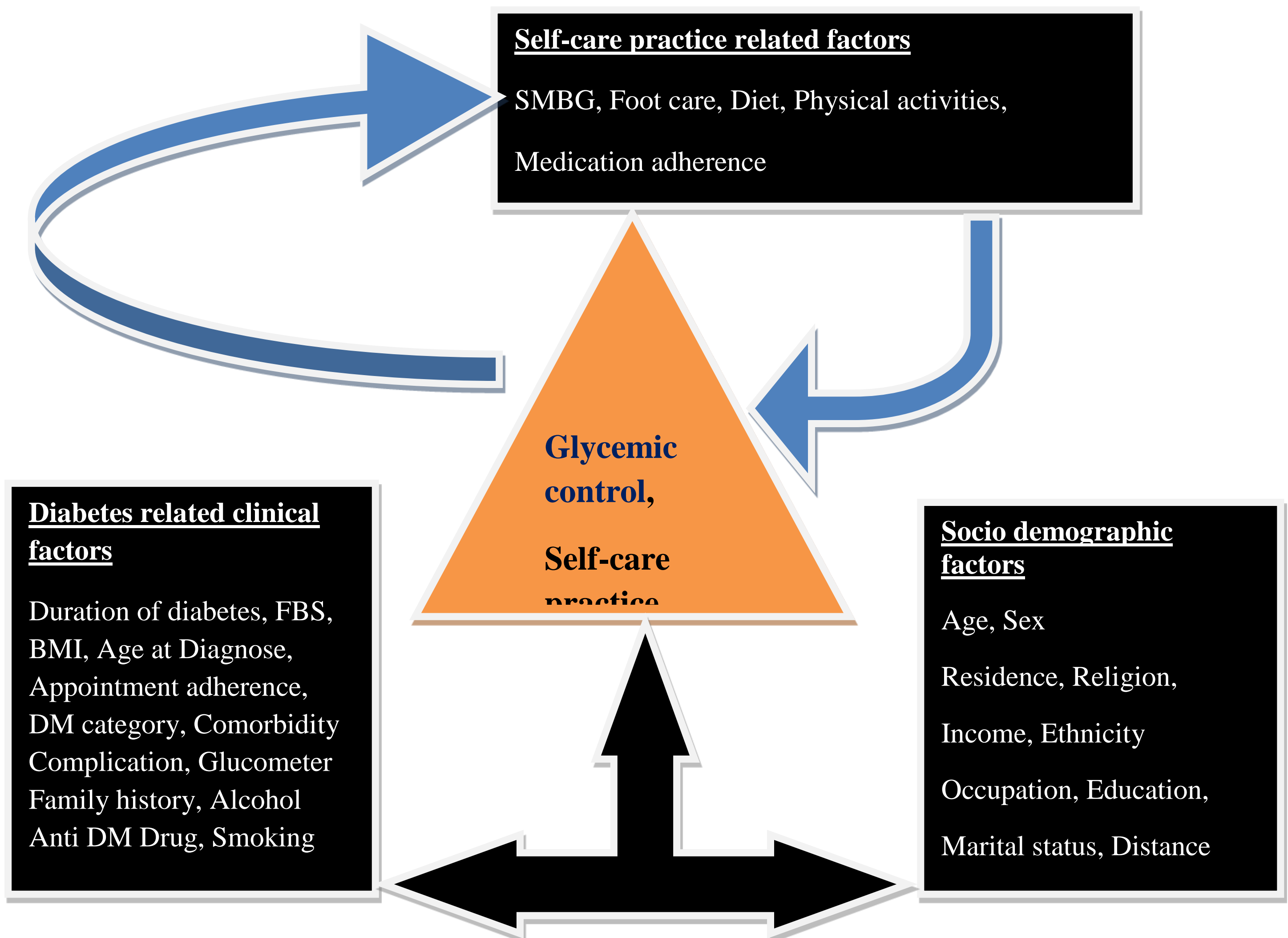


Figure 1**:** Conceptual frame work for the assessment of glycemic control and self-care practice among adult patients with diabetes mellitus in Tercha General Hospital, Dawro Zone, Southern Nation Natio

CHAPTER THREE: OBJECTIVES OF THE STUDY

3.1. General objective

To assess Glycemic control and self-care practice among diabetes patient in Tercha general hospital, Dawro zone, Southern Nation, Nationalities and Peoples Region, Ethiopia; 2020.

3.2. Specific objectives

- To determine the status of glycemic control and its associated factors among diabetes patient in Tercha general hospital, Dawro zone, Southern Nation, Nationalities and Peoples Region, Ethiopia
- To asses the status of self-care practice and its associated factors among diabetes patient in Tercha General Hospital, Dawro zone, Southern Nation, Nationalities and Peoples Region, Ethiopia
- To identify the association between self-care practice and glycemic control among diabetes patients in Tercha general hospital, Dawro zone, Southern Nation Nationalities and Peoples region, Ethiopia.

CHAPTER FOUR: METHODS AND MATERIALS

4.1. Study Area and Period

A study was conducted in Dawro Tercha general hospital, Dawro Zone, Southern Nation, Nationalities and Peoples Region, Ethiopia. The hospital is acting as a final destination for the whole communities in Dawro zone; treatments and follow up for the patients having chronic conditions including diabetes mellitus, surgery, central laboratory service and diagnostic work up is performed only in this hospital. It is hospital is located in Dawro zone capital Tercha city, which is 560 kilo meter far from Ethiopian capital Addis Ababa and 300 kilo meter far from regional capital Hawassa. Dawro Zone has a total population of 961,000 and is bounded by GamoGofa zone, Wolayta zone, South Omo zone, Kambata Tambaro zone (the territory is separated by Omo river) and Konta Special Woreda (the territory separated by Gojeb river)

A study was conducted from March 07-April 11/2020.

4.2. Study design: institutional-based cross-sectional study design was employed.

4.3. Popolation

4.3.1. Target population: all diabetes patients in Dawro zone.

4.3.2. Source Population: all diabetes patients visited Tercha general hospital for follow up.

4.3.3. Study population: totalities of subjects who are visited Tercha general hospital during study period and meet inclusion criteria.

4.4. Eligibility criteria

4.4.1. Inclusion Criteria

- Adult participants (age 19 and above) based on WHO recommendation [39] and minimum 6 month apearace on follow up, since participants need these duration to adapt their illness, practice self-care and glycemic control.

4.4.2. Exclusion Criteria

- Adults having cognitive impairments based on mental status examination, hearing impairments or those patients who were unable to provide appropriate information.
- Gestational diabetes patients.

4.5. Sample size determination

Since the study has two dependent variables, sample size was calculated by assuming a mean of two prevalence(glycemic control and self care practice) which became 28% taken from related study purposively [27, 35]. A sample was calculated based on the assumption of single population proportion formula, n = $(Z\alpha/2)^2 p(1-p)/d^2$.

Where Zα/2: 95% confidence interval (1.96), P: prevalence (28%), D: margin of error (0.05). A computed result was yielded 307. Since a source population was below 10, 000, the required final sample has been corrected using a formula, nf = no/1 + no/N. Where nf: the final sample size, no: initial sample size which was 307 and N: source population which was 700. Based on this formul $nf = 210$**.** By considering 5% non-response rate, 220 diabetic patients were became final sample for a study.

Mathemathical expression as shown below:

$$n = \frac{z\left(\frac{\alpha}{2}\right)2 * P(1-p)}{d^2}$$

Where

n- Minimum sample size

P-Prevalence of good glycemic control (28%)

d-the margin of sampling error tolerated (5%)

$Z_{\alpha}/2$-is the standard normal distribution at 1-α% confidence level (95%=1.96)

Using correction formula $n = \frac{(1.96)^2 * 0.28(1-0.28)}{0.05^2}$

n = 307 subjects

Correction for finite population <10,000, N=700

$$nf = \frac{no}{1 + no/N}$$

Where

nf =Final sample size

no= initial sample size

$$nf = \frac{307}{1 + 307/700}$$

nf =210. By adding the 5% non-response rate the total sample size became 220.

4.6. Sampling Procedure

Since a hospital appoint diabetes patient for one month and serve 500 patients Monthly (during the study period), systematic sampling method was employed (500 study subjects divided by 220 final sample size=2). So that the first participant (random start) selected by lottery method and picking the rest of subjects had continued via selection of every other patient till final sample size has been reached. Since diabetes patient coming for follow up from the whole zone were served by only Tercha general hospital, it was selected purposively (Figure: 2).

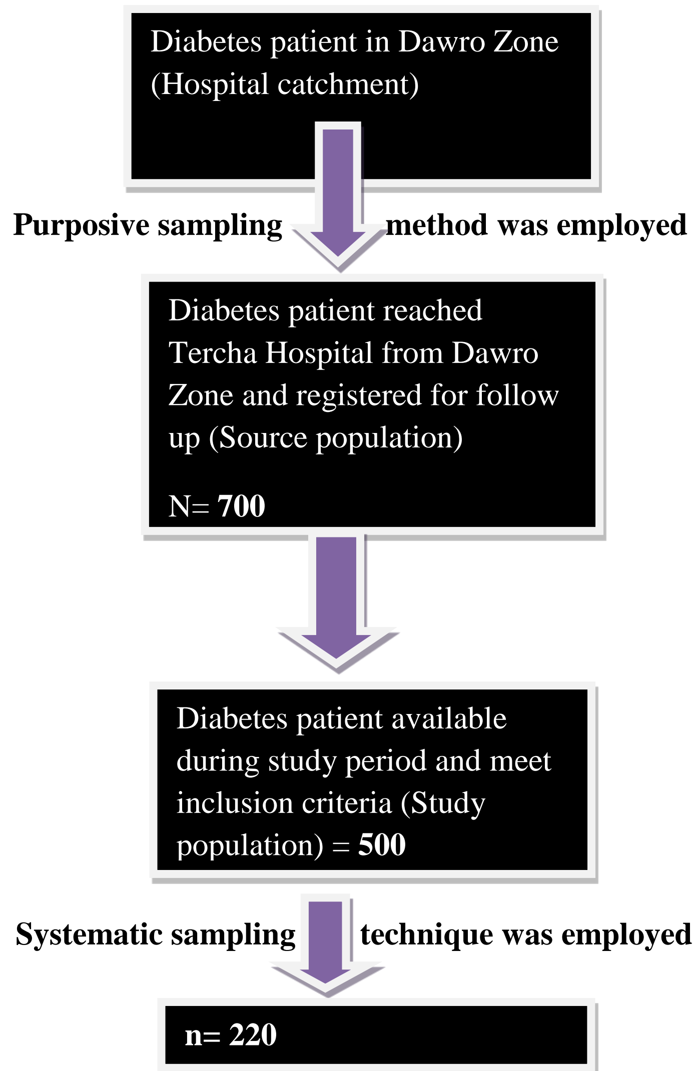


Figure 2**:** Schematic representation of sampling procedure in Dawro Tercha general hospital, SNNPR, Ethiopia; 2020.

4.7. Operational definitions

Good glycemic control

The level of glycemic control was categorized as good glycemic control for those whom mean of the last three visit FBS results were less than 126 mm/dl.

Poor glycemic control

The level of glycemic control was categorized as poor glycemic control for those whom mean of the last three visit FBS results were greater than 126 mm/dl. The principle of computation and dichotomization for glycemic control were based on related studies recommendation [27, 29].

Good self-care practice

Respondents were labeled to have “good self-care” for those whom computed mean of variables under five components of selfcare practice fall in the range of 4-7 day except for medication adherence (All 7 days needed for medication adherence)

Poor self-care practice

Respondents were labeled to have “poor self-care” for those whom computed mean of variables under five components of selfcare practice fall in the range of 0-3day except for medication adherence (0-6 days for medication adherence)

NB: Regarding computation for self-care practice status, five component (Physical activities, SMBG, medication adherence, foot care and dietary self-care practice) needed. This method of computation and dichotomization were based on validated tool recommendation and previous related studies [29, 40].

BMI in Kg/M^2

Underweight: < 18.50
Normal: 18.50 - 24.99
Overweight: 25 - 29.99
Obese: ≥ 30 based on recent updates [29]

4.8. Study variables

4.8.1. Independent variables

- Socio Demographic characteristics (age, sex, residence, Income, Occupation, Educational status, Ethnicity, Distance and Marital status)
- Diabetes related clinical factors (Comorbid, complication, glucometer, BMI, FBS, Types of DM, Family history, Age at the time of diagnosis, Smoking Alcohol appointment adherence and Anti diabetes)
- Self-care practice
- Physical activities
- Foot care
- Medication adherence
- SMBG
- Dietary management

4.8.2. Dependent Variable

- Glycemic control, Self-care practice

4.9. Data collection instrument

A study tool was adopted from similar studies [40, 41, and 42]. Data was collected by using standardized structured questionnaires and had four main categories: 1. Socio demographic factors related question which is composed of 10 questions, 2. Diabetes related clinical factors related question which is composed of 13 question, 3. Self-care practice related question which contains question of diet, physical activities, SMBG, foot care, and medication adherence and has total of 19 questions, 4. Self-care recommendation related question which contains 19 questions. Grand total of questions needed for the assessment of glycemic control and self-care practice were 61 in number.

4.10. Data collection procedure

The respondents were interviewed using standardized structured questionnairess prepared in English and translated into official (Amharic) and local (Dawrogna) language respectively and translated back into official and English from local language for the sake of relatively best consistency and controlling bias. The data was collected after pretest on 10% of actual sample size. To identify the patterns of glycemic control, the patients last three successive FBS results were reviewed from history document retrospectively.

Anthropometric measurements was used to assess body mass index and the data was collected by 3 trained diploma nurses. Continuous followup by one Senior BSc nurse (Supervisor) and daily monitoring by principal investigator done throughout the data collection period.

4.11. Data quality Assurance

Pretest was carried out before actual field work and training was provided for data collectors. Furthermore; continuous coordination, monitoring and supervision were carried out by supervisor and principal investigator as regularly daily basis throughout the period of data collection.

4.12. Data analysis

The collected data was coded and entered into Epi Data version 4.6 and exported in to SPSS Version 20 statistical software package for the seek of cleaning and analysis. To explain the study population in relation to relevant variables, descriptive statistics such as mean, frequencies and percentages were calculated. In addition, cross tabulation was computed for cross comparison of dependent and independent variables needed for graph and logistic regression. To see the relative effect of independent variable on the dependent variable, bivariate and multivariate logistic regression analysis were carried out and odd ratio was used to interpret the strength of association at 95% CI. A statistical test was considered satisfactory at p-value of <0.25 and <0.05 for multivariate gate entry and minima for the test of significance in multivariate logistic regression analysis workup respectively to assure as independent predictor. The result was presented in the form of figures and tables.

4.13. Ethical consideration

A formal letter of ethical clearance and approval were obtained from an institutional review board of Addis Ababa University (IRB-AAU), college of health sciences, school of nursing and midwifery research committee and other responsible bodies. IRB official and Permission letter were submitted to Dawro Tercha hospital manager. Then approval was confirmed after further communication with medical director and professionals working in diabetes clinic. Participants were informed about the purpose of study and their right to participate or to terminate at any time if they were not comfortable. Verbal consent of respondent was obtained by asking whether they participate or not before proceeding to the questions. Generally respondents were not requested to write their name, and their confidentiality were reserved.

4.14. Dissemination plan

The study findings will be disseminated to Addis Ababa University College of health science library and hospital. Finally efforts will be made for dissemination in a reputable international journal and also be presented in different conferences.

CHAPTER FIVE: RESULT

5.1. Socio demographic characteristics of participants

A total of 220 samples were planned for the study and out of them, 213 diabetes patient were participated and included in analysis as well. Seven subjects were excluded from analysis due to incompleteness and consistency of their response, yielding a response rate of 97%. Among them, majorities 77(36.2%) age group was between 47-59Year and mean age was44.38$\pm$14.238yr. Male population outweighed by 145(68.1%) and protestant view follower had took first place by 132(62%), whereas 166(77.9%) of the respondents were in the ethnic group of Dawro followed by Amara 23(10.8%) and eighty eight (57.7%) of the respondents were civil servant. More than half of the respondents 137(64.32%) and 112(52.6%) came from distant and rural area respectively in terms of distance and residence. A significant number 84(39.4%) of the respondents had attended secondary education and one hundred sixty nine (79.3%) were married (Table 1).

Table 1: Socio demographic characteristics of diabetes patients in Tercha hospital, Dawro Zone, SNNPR, 2020. n=213

Variables	Frequency(N)	Percentage (%)
Gender		
Male	145	68.1
Female	68	31.9
Total	213	100.0
Age		
19-32	60	28.2
33-46	46	21.6
47-59	77	36.2
>=60	30	14.1
Mean	44.38±14.238	
Marital status		
Single	36	16.9
Married	169	79.3
Widowed	8	3.8
Residence		
Rural	112	52.6
Urban	101	47.4
Educational status		
No formal education	43	20.2
Primary education	47	22.1
Secondary education	39	18.3
College and above	84	39.4
Occupation		
Farmer	35	16.4
Civil servant	88	57.7
Merchant	31	14.6
Housewife	28	13.1
Unemployed	28	13.1
Other	3	1.4
Religion		
Protestant	132	62.0
Orthodox	80	37.6
Muslim	1	0.5
Ethnicity		
Dawro	166	77.9
Oromo	9	4.2
Amara	23	10.8
Other	15	7.0
Income(ETB)		
Very low	94	44.1
Low	47	22.1
Medium	42	19.7
Average	13	6.1
High	17	8.0
Distance		
Near	76	35.68
Far	137	64.32

5.2. Diabetes related clinical characteristics of the respondents

Majorities 96(45.1%) of respondents duration of diabetes were fall in the range of 1-6Years and 157(73.7%) of them had no family history of diabetes, whereas significant numbers 103(48.4%) of respondents were with BMI categorized as normal with mean 23.51 $\pm$ 4.397 Kg/M^2. The mean of FBS for the last three visits was 175.97 $\pm$ 52.809 and 127 (59.6%) of the respondents failed to adhere for appointment had no comorbidities and glucometer respectively. .Regarding alcohol consumption and presence of complication, only 20(9.4%) of them drunk alcohol in the last seven days and most of them 131(61.5%) had developed diabetes complication. The mean age during diagnosis of diabetes was 36.24 $\pm$ 12.881Years and regarding category of diabetes and smoking, Type II outweigh 126(59.25%) and none of the respondents have said yes for the question related to latent history of exposure to cigarate as well (Table: 2).

Table 2: **Diabetes related clinical characteristics of diabetes patients in Dawro Tercha hospital, Dawro Zone, SNNPR, Ethiopia. 2020. n=213**

Variables	Frequency (N)	Percentage (%)
Duration of DM		
1-6	96	45.1
7-12	73	34.3
13-19	44	20.7
Family history		
Yes	56	26.3
No	157	73.7
BMI Mean	23.51 +-4.397	
FBS 3visitAve		
Mean	175.97 +-52.809	
Medication		
OHA	111	52.1
Insulin	87	40.8
OHA + Insulin	15	7.0
Complication		
Yes	131	61.5
No	82	38.5
Category of DM		
Type I	87	40.8
Type II	126	59.2
Comorbidity		
Yes	104	48.8
No	109	51.2
Glucometer Presence		
Yes	52	24.4
No	161	75.6
Age at diagnose		
12-25	57	26.8
26-39	62	29.1
40-53	73	34.3
54 and above	21	9.9
Mean	36.24 +-12.881	
Alcohol		
Drunkard	20	9.4
Not drunkard	193	90.6

Body mass index for majorities of the respondent 103(48.4%) had fall in the range of normal and least of them 18(8.5%) had obesity. On the other hand, more than half of the respondent didn't adhered for appointment. For further extension (Figure 3 and 4)

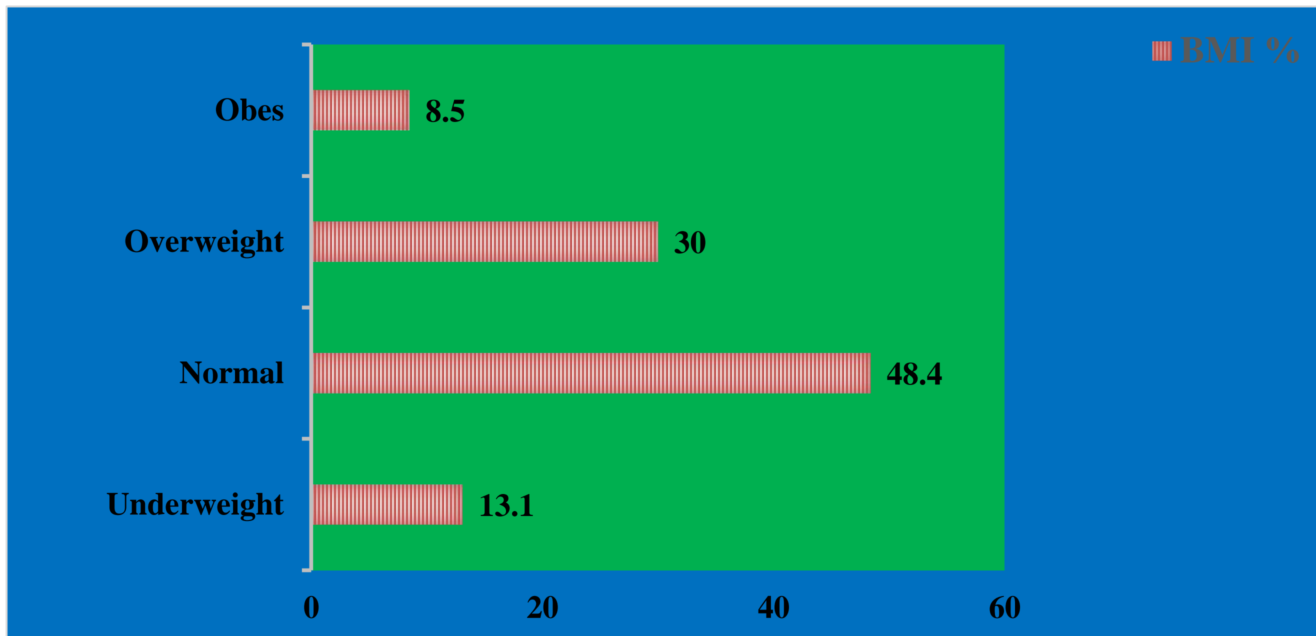


Figure 3**:** BMI of the respondents, among diabetes patient in Dawro Tercha hospital Dawro Zone, SNNPR, Ethiopia; 2020.

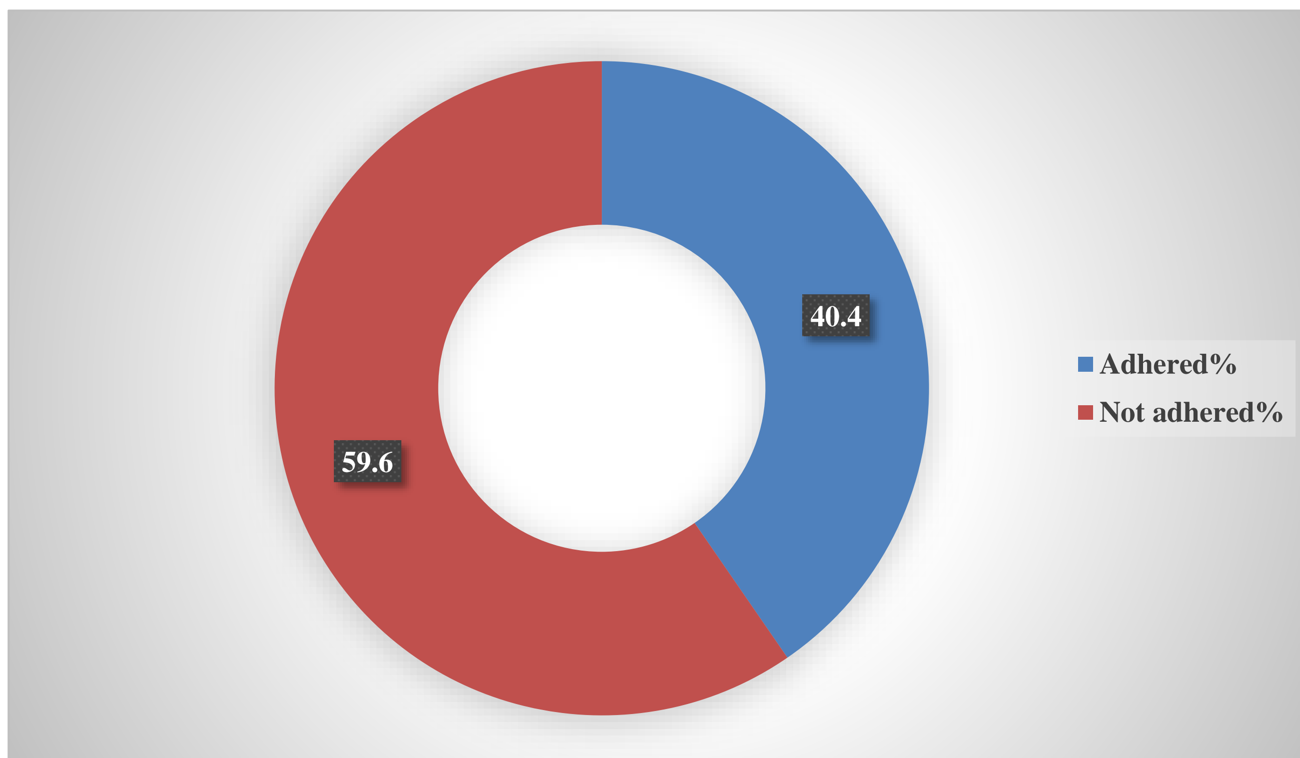


Figure 4: Appointment adherence of the respondents among diabetes patient in Dawro Tercha General hospital, Dawro Zone, SNNPR, Ethiopia; 2020.

5.3. Glycemic control status

Most of the respondents164 (77%) didn't controlled their blood glucose and categorized as poor glycemic control (Figure: 5).

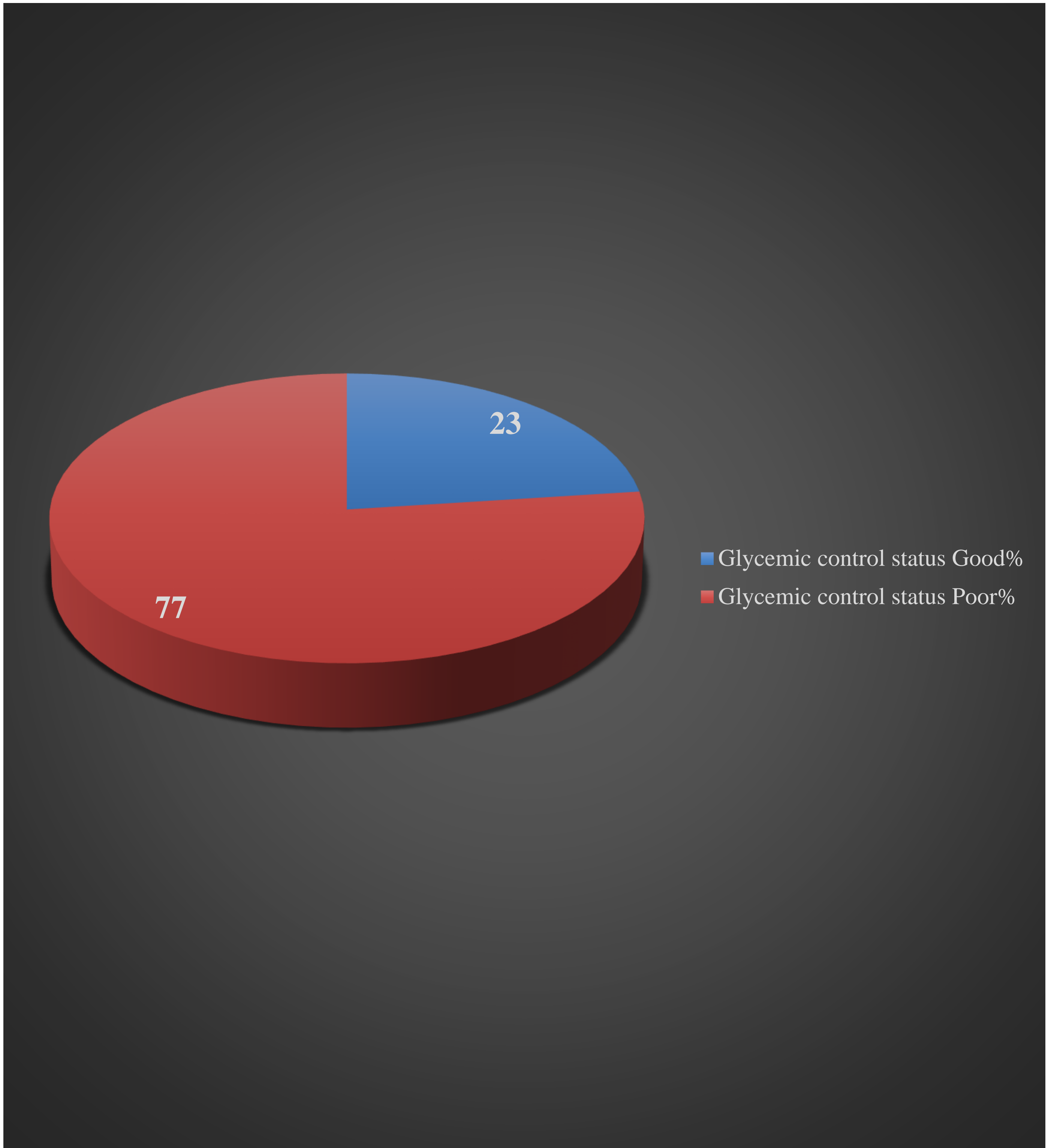


Figure 5: Glycemic control status of the respondents, among diabetes patient in Dawro Tercha hospital, Dawro Zone, SNNPR, Ethiopia; 2020.

Pick of poor glycemic control (90%) were scored in 60-72Years, whereas respondents in the age group of 33-46Years were better attained good glycemic control status relatively (37%) Figure: 6.

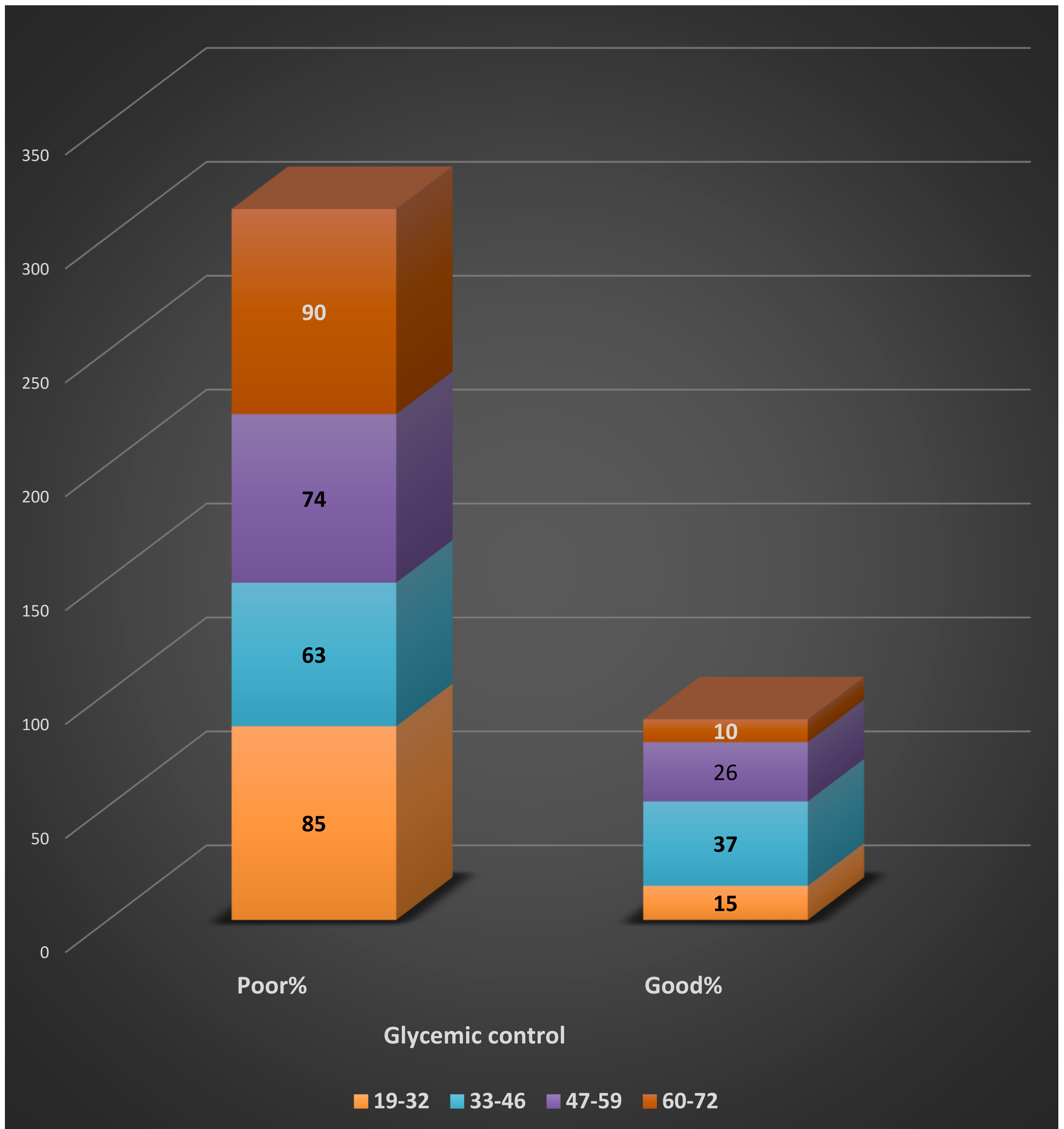
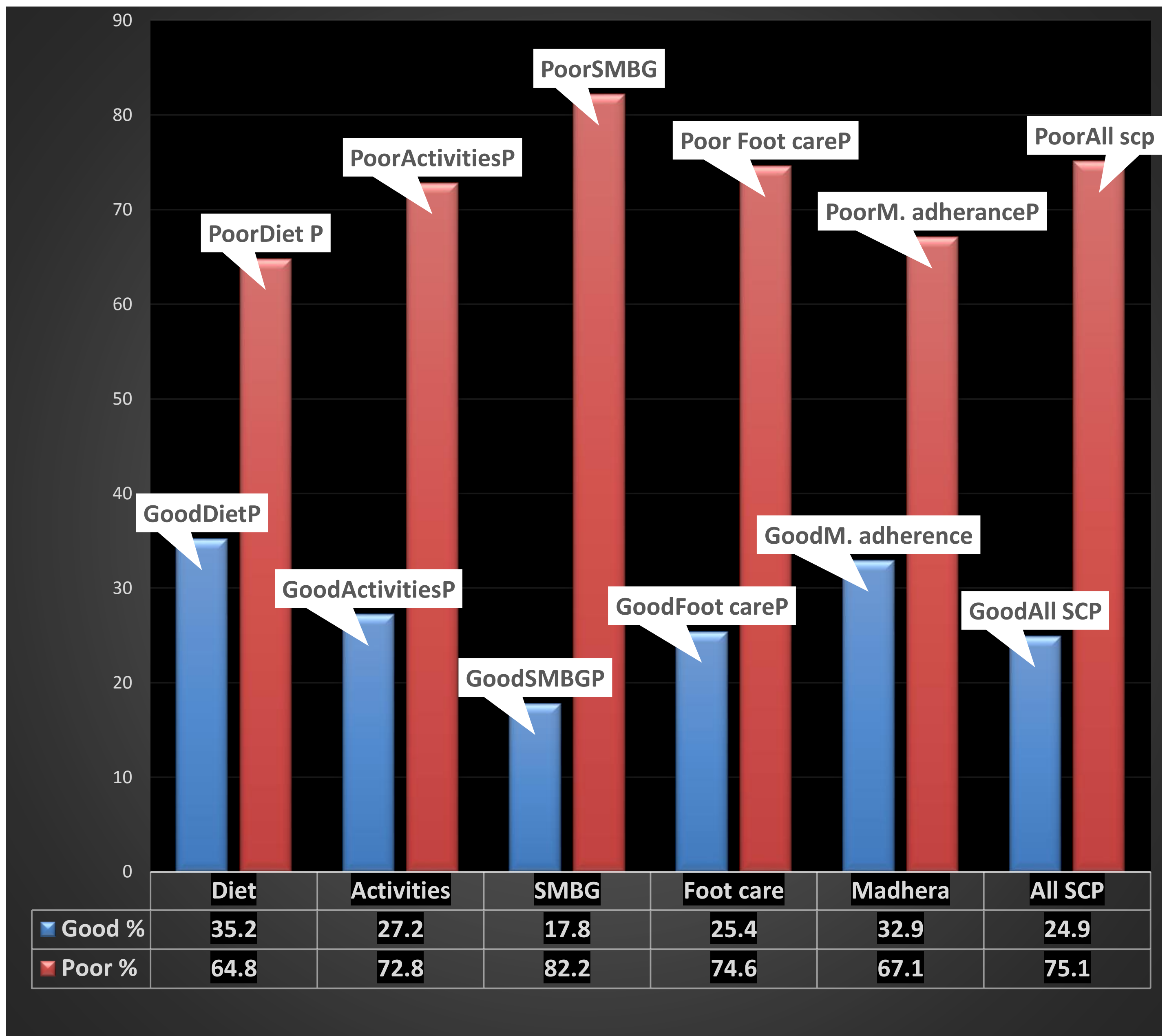


Figure 6**:** Glycemic control status stacked by age for the respondents, among diabetes patient in Dawro Tercha hospital, Dawro Zone, SNNPR, Ethiopia; 2020.

5.4. Self-care practice status

Majorities of the respondents were not reached good self-care practice status in all category including overall self-care practice. Of them, the poorest achievement 175(82.2%) were scored under SMBG sub category and generally, overall self-care practice status become 160(75.1%) for poor; meaning only 53(24.9%) of the respondents had attained good self-care practice (Figure 7).



	Diet	Activities	SMBG	Foot care	Madhera	All SCP
Good %	35.2	27.2	17.8	25.4	32.9	24.9
Poor %	64.8	72.8	82.2	74.6	67.1	75.1

Figure 7: Status of self-care practice in terms of category for the respondents, among diabetes patient in Dawro Tercha hospital, Dawro Zone, SNNPR, Ethiopia; 2020.

SCP…Self-care practice.

SMBG…Self-monitoring of blood glucose.

M.adherance……Medication adherence.

P………..Practice

5.5. Glycemic control versus self-care practice status

Generally obvious relationship was observed between glycemic control and self-care practice status in cross tabulation. Of those who were achieved good self-care practice, 83% were kept their blood glucose level in the range of therapeutic glycemic control. Similarly of those respondents who had poor self-care practice, 96.9% were under the status of suboptimal glycemic control. (Figure: 8)

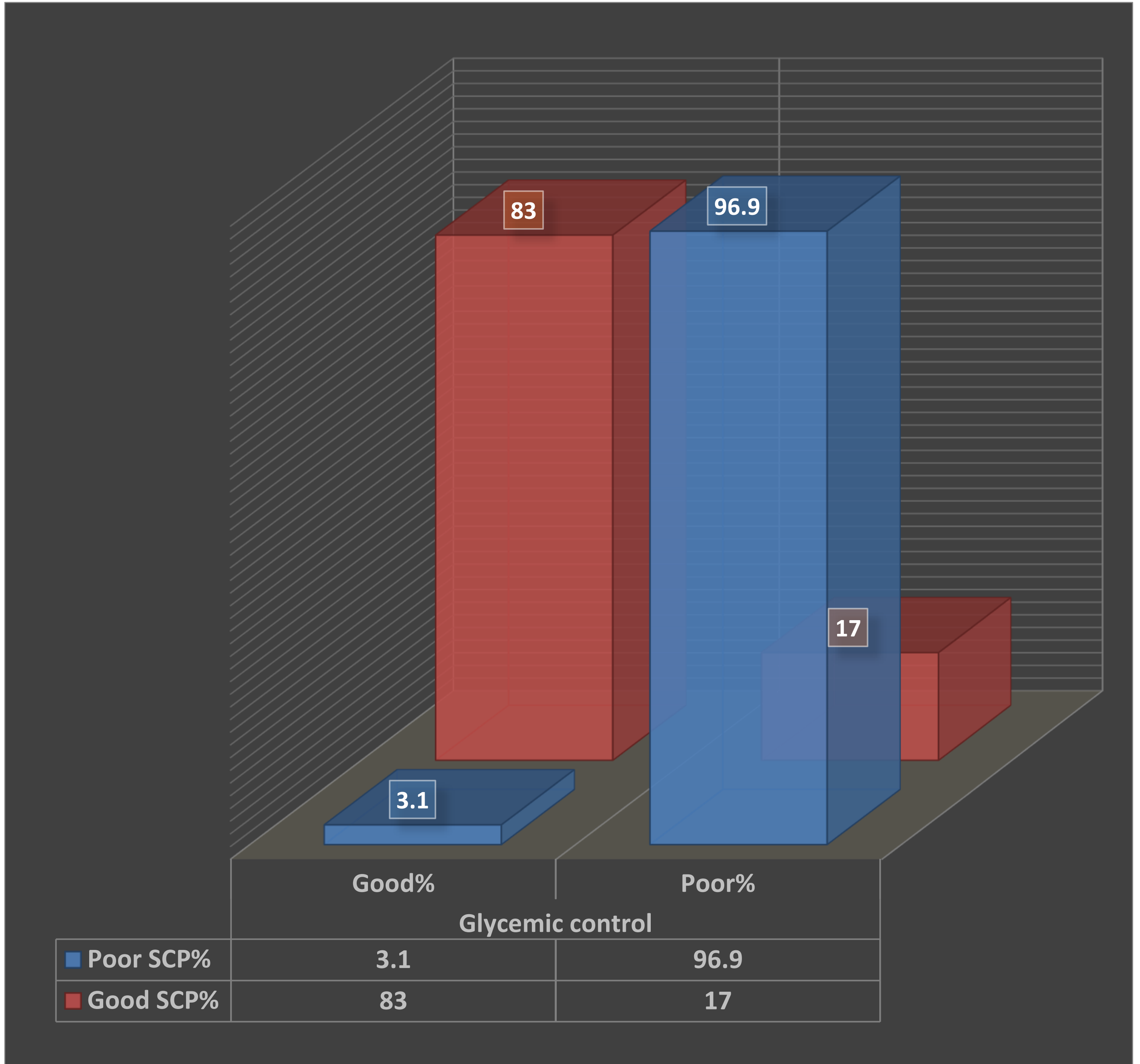


Figure 8: Glycemic control versus self-care practice status for the respondents in Dawro Tercha Hospital, Dawro Zone, SNNPR; Ethiopia 2020.

SCP……Selfcare practice

5.6. Self-care recommendation

Regarding self-care recommendation, the respondents reported advice given to them by health professionals on four major self-care practice parameters. From dietary parameters, significant number of them 193(90.6%) advised regarding sweets or simple sugar (E.g. soft drinks, desserts, on diet sodas, candy bars); whereas regarding physical activities, only 57(27.7 %) of them advised for exercising continuously for 20 minutes at least 3 times a week. Regarding SMBG parameter, nearly one-third of respondents 66(31.0%), 41(19.2%) were advised for testing their blood sugar using a machine to read the results and testing your urine for sugar respectively. On the area of smoking status, only 3(1.4%) of them requested for their smoking status and none of them had history of exposure to Cigarate or tobacco (Table: 3).

Table 3: Summary of self-care practice recommendations given for diabetes patients in Dawro Tercha hospital, Dawro Zone, SNNPR, Ethiopia, 2020. n=213

Advice	Alternative response	FREQUENCY			
		Yes		No	
		No	%	No	%
DIET	Follow a low fat eating plan	144	67.6	69	32.4
	Follow a complex carbohydrate diet	98	46.0	115	54.0
	Reduce the number of calories you eat to lose weight	99	46.5	154	53.5
	Eats lots of food high in dietary fiber	88	41.3	125	58.7
	Eat lots (at least 5 serving per day)of fruits and vegetables	125	60.5	88	41.3
	Eats very few sweets (E.g. desserts, on diet sodas, candy bars	193	90.6	20	9.4
PHYSICAL EXERCISE	Get low level exercise (such as walking) on daily basis	137	64.3	76	35.7
	Exercise continuously for a least 20 minutes at least 3 times a week	59	27.7	154	72.3
	Fit exercise into your daily routine (E.g. take stairs instead of elevators, park a block away and walk, etc	175	82.2	38	17.8
	Engage in specific amount , type, duration and level of exercise	58	27.2	155	72.8
SMBG	Test your blood sugar using a drop of blood from your finger and a color chart	2	0.9	211	99.1
	Test your blood sugar using a machine to read the results	66	31.0	147	69.0
	Test your urine for sugar	41	19.2	172	80.8
SMOKING	At your last doctor's visit, did anyone ask about your smoking status	3	1.4	210	98.6
	Did you smoke cigarate?	-	-	213	100.0

5.7.Factors associated glycemic control

Eight variables (Age, education, distance, duration of diabetes, diabetes complication, comorbdities, glucometer, and appointment) were meet the required minima for multivariate logistic regression analysis from bivariate logistic regression analysis workup by scoring p value < 0.25 and of them; four variables (Age, diabetes complication, glucometer and appointment adherence) were qualified by scoring p value <0.05 and nominated in the shortlist of significant predictor for glycemic control.

For further extension, those who were on the age group of 33-46 had .039 times good glycemic control when compared to the age group 60 Year and above; [AOR: .039; 95%CI (.004, .334)]. Regarding diabetes complication, those who had no complication were 7.82 times attained good glycemic control than those who had developed complication; [AOR: 7.82; 95%CI (2.238, 27.38)]. Regarding glucometer presence, those who had glucometer in their home had 11.42 times good glycemic control when compared with those who had no glucometer; [AOR: 11.42; 95%CI (3.36, 38.74)]. Whereas regarding appointment; those who had adhered for appointment were 6.59 times attained good glycemic control than those who didn’t adhered for appointment; [AOR: 6.59; 95%CI (1.76, 24.653)] (Table: 4).

Table 4: Factors associated with glycemic control among diabetes patients in Dawro Tercha hospital, Dawro Zone, SNNPR, Ethiopia; 2020. n=213

Variables	**Glycemic control status**		**COR(95%CI)**	**P value**	**AOR(95%CI)**	**P value**
	Good	**Poor**				
Age(Yr) 19-32	9(15.0%)	51(85.0%)	.301(.119,.761)	.011*	.125(.012, 1.283)	.080
33-46	17(37.0%)	29(63.0%)	.503 (.210, 1.204)	.123	.039(.004, .334)	**.003****
47-59	20(26.0%)	57(74.0%)	1.588 (.397, 6.360)	.513	.066(.009, .460)	**.006****
60 and above	3(10.0%)	27(90.0%)	1		1	
Education Illiterate	9(20.9)	34(79.1)	1.118(.398, 3.141)	.833	1.61(.235, 11.131)	.624
Primary	9(19.1%)	38(80.9%)	1.800(.546, 5.929)	.334	2.16(.270, 17.395)	.616
Secondary	5(12.8%)	34(87.2%)	.590(.248, 1.407)	.234	.881(.149, 5.197)	.889
College&ab	26(31.0%)	58(69.0%)	1		1	
Distance Near	19(24.7%)	58(75.3%)	6.105(1.390, 26.809)	.017*	.180(.013, 2.469)	.199
Medium	5(55.6%)	4(44.4%)	1.094(.524, 2.287)	.811	.699(.172, 2.840)	.616
Very far	18(25.0%)	54(75.0%)	.597(.247, 1.443)	.252	2.111(.371,12.000)	.400
Extremely far	7(12.7%)	48(87.3%	1		1	
DM duration 1-6	15(15.6%)	81(84.4%)	.780(.350, 1.740)	.545	.652(.164, 2.593)	.543
7-12	14(19.2%)	59(80.8%)	.222(.099, .499)	.000**	.421(.094, 1.886)	.258
13-19	20(45.5%)	24(54.5%)	1		1	
DM complcation Yes	6(4.6%)	125(95.4%)	1		1	
No	43(52.4%)	39(47.6%)	22.970(9.093, 58.02)	.000***	7.82(2.238, 27.38)	**.001****
Comorbidity Yes	14(13.5%)	90(86.5%)	1		1	
No	35(32.1%)	74(67.9%)	3.041(1.522, 6.074)	.002**	2.012(.544, 7.444)	.295
Glucometer Yes	34(65.4%)	18(34.6%)	18.385(8.426, 40.17)	.000***	11.42(3.36, 38.74)	**.000*****
No	15(9.3%)	146(90.7%)	1		1	
Apointment Adhered	44(51.2%)	42(48.8%)	25.562(9.506, 68.73)	.000***	6.59(1.76, 24.653)	**.005****
Not adhered	5(3.9%)	122(96.1%)	1		1	

5.8. Factors associated with overall self-care practice

Bivariate logistic regression analysis workup rated nine variables (BMI, age, comorbdities, education, diabetes complication, diabetes category, duration of diabetes, distance and appointment adherence) as candidate for multivariate logistic regression by the filtering standard P value < 0.25, whereas multivariate logistic regression analysis output assured five variables (education, diabetes complication, diabetes category, distance and appointment adherence) as predictors of overall self-care practice by minima, P value < 0.05.

For further extension, those who were illiterate had .172 times poor self-care practice than those who were attained College and above carrier [AOR: .172; 95%CI (.034, .881)]. Regarding distance, those who were came from medium distance had 12.01 times good self-care practice than those who were travelled extremely far distance to reach hospital [AOR: 12.01; 95%CI (1.84, 26.217)]. Whereas regarding diabetes complication, those who didn't developed complication had 13.36 times good self-care practice when compared to those who had complication [AOR: 13.36; 95%CI (4.08, 43.768)].

On the area of diabetes category, those who were diagnosed as type I diabetes were 11.085 times achieved good self-care practice than those who were diagnosed as type II diabetes [AOR: 11.085; 95% CI (1.88, 65.26)]. Whereas on the area of appointment; those who had adherence for appointment had also 6.19 times adherence for good self-care practice when compared to those respondents who didn't adhered for appointment [AOR: 6.19; 95%CI (1.719, 22.352)] (Table: 5).

Table 5: Factors associated with self-care practice among diabetes patients in Dawro Tercha hospital, Dawro Zone, SNNPR, Ethiopia; 2020. n=213

Variables	**Self-care practice status**		**COR(95%CI)**	**P value**	**AOR(95%CI)**	**P value**
	Good	**Poor**				
Age 19-32	13(21.7%)	47(78.3%)	1.383(.442, 4.323)	.577	.489(.033, 7.197)	.602
33-46	15(32.6%)	31(67.4%)	2.419(.773, 7.573)	.129	1.102(.133, 9.125)	.928
47-59	20(26.0%)	57(74.0%)	1.754(.592, 5.202)	.311	2.36(.467, 11.948)	.299
60 and above	5(16.7%)	25(83.3%)	1		1	
Education Illiterate	9(20.9)	34(79.1)	.476(.202, 1.126)	.091	.172(.034, .881)	**.035***
Primary	10(21.3%)	37(78.7%)	.486(.212, 1.114)	.088	.321(.080, 1.294)	.110
Secondary	4(10.3%)	35(89.7%)	.206(.067, .635)	.006**	.088(.015, .530)	**.008****
College&ab	30(35.7%)	54(64.3%)	1		1	
Distance Near	19(24.7%)	58(75.3%)	1.674(.693, 4.047)	.252	1.881(.376, 9.409)	.442
Medium	6(66.7%)	3(33.3%)	10.222(2.150, 48.60)	.003**	12.01(1.84, 26.217)	**.014***
Very far	19(26.4%)	53(73.6%)	1.832(.755, 4.444)	.180	2.764(.697, 10.967)	.148
Extremely far	9(16.4%)	46(83.6%)	1		1	
DM Duration 1-6	14(14.6%)	82(85.4%)	.205(.090, .465)	.000***	.570(.123, 2.653)	.474
7-12	19(26.0%)	54(74.0%)	.422(.191, .931)	.033*	2.216(.528, 9.306)	.277
13-19	20(45.5%)	24(54.5%)	1		1	
BMI Underweght	7(25.0%)	21(75.0%)	2.667(.487, 14.608)	.258	2.435(.201, 29.461)	.484
Normal	35(34.0%)	68(66.0%)	4.118(.896, 18.930)	.069	5.993(.710, 50.598)	.100
Overweight	9(14.1%)	55(85.9%)	1.309(.256, 6.683)	.746	1.286(.177, 9.352)	.803
Obese	2(11.1%)	16(88.9%)	1		1	
DM complcation Yes	7(5.3%)	124(94.7%)	1		1	
No	46(56.1%)	36(43.9%)	22.635(9.412, 54.43)	.000***	13.36(4.08, 43.768)	**.000*****
DM catgory Type I	29(33.3%)	58(66.7%)	2.125(1.132, 3.988)	.019*	11.085(1.88, 65.26)	**.008****
Type II	24(19.0%)	102(81.0%)	1		1	
Comorbidity Yes	15(14.4%)	89(85.6%)	1			
No	38(34.9%)	71(65.1%)	3.176(1.618, 6.232)	.001**	1	
Apointment Adhered	42(48.8%)	44(51.2%)	10.066(4.759, 21.29)	.000***	6.19(1.719, 22.352)	**.005****
Not adhered	11(8.7%)	116(91.3%)	1		1	

5.9. Association between Glycemic control and self-care practice

To identify presence of association between the two prevalence (glycemic control and self-care practice), five components of self-care practice(dietary self-care, physical activities self-care, SMBG self-care, foot care self-care and medication adherence self-care) together with overall self-care practice were entered in logistic regression and positive association were seen after comparison with glycemic control. According to bivariate logistic regression analysis workup output, medication adherence, physical activities and overall self-care practice were fulfilled requirements for multivariate analysis gate (P value <0.25) and of them, medication adherence and overall self-care practice were qualified by meeting screening minima of multivariate logistic regression analysis (P value < 0.05) and approved presence of positive association between the two dependent variables or prevalence (glycemic control and self-care practice) as well.

For further extension so far, on the area of medication adherence self-care; those who were not adhered for medication were 6.42 times not adhered to good glycemic control [AOR: 6.42; 95%CI (1.105, 37.36)]. Whereas regarding all self-care practice, the respondents who had poor self-care practice had also 14.25 times poor glycemic control when compared to those who had good self-care practice [AOR: 14.25; 95% CI (2.547, 79.79)] (Table: 6).

Table 6: Association between glycemic control and self-care practice among diabetes patients in Dawro Tercha hospital, Dawro Zone, SNNPR, Ethiopia; 2020. n=213

Variables		**Glycemic control status**		**COR(95%CI)**	**P value**	**AOR(95%CI)**	**P value**
		Poor	**Good**				
Activities SCP							
	Poor	148(95.5%)	7(4.5%)	5.50(2.42, 14.79)	.000***	4.23(.997, 17.99)	.050
	Good	16(27.6%)	42(72.4%)	1		1	
MED Adherence							
	Poor	140(97.9%)	5(3.1%))	8.444(2.740, 31.818)	.000***	6.42(1.105, 37.36)	**.038***
	Good	24(34.3%)	46(65.7%)	1		1	
All SCP							
	Poor	155(96.9%)	5(3.1%)	15.556(4.309, 47.46)	.000***	14.25(2.547, 79.79)	**.002****
	Good	9(17.0%)	44(83.0%)	1		1	

* Statistically significant at p-value< 0.05

** Statistically significant at p-value <0.01

*** Statistically significant at p-value <0.001

SCP……..Self-care practice

MED……Medication

CHAPTER SIX: DISCUSSION

The first and only way to prevent the two worst outcome of diabetes (premature death and permanent disabilities) is maintaining blood glucose level under therapeutic range (<126g/dl) which mean good glycemic control. Yet the practice was still under question mark regardless improvement in infrastructure coverage and taskforce profile. Computed prevalence of good glycemic control in this study further assured these gap; since only 23% of the respondents were achieved good glycemic control, which become extremely low and kept in red mark. These prevalence further uncovered an ultimate fact, outnumbered diabetes patient have premature death and permanent disabilities in front of them and roads to series socioeconomic crisis became a rule. The finding further brightened the intervention by responsible bodies in developing countries especially in Ethiopia has been under question and remained unclear regarding what they are doing to ward these risk.

In practical speaking, this finding was consistent with studies conducted in Saudi Arabia(25%), Sudan(20%), Cameroon and Guinea(26%), Sri Lanka(24.3%), Brazil(24%), India(23.4%) of participants were reached to good glycemic control [6,7,8,19,29,32]. Whereas relatively higher than studies conducted in Pakistan (17%), India (8.2%) and Jimma (18%) [5,27,30]; these variation might be due to difference in study year and period, study design and geo demographic difference as well. Prevalence of good glycemic control in this study was on the other hand lower than studies conducted in another state of India (64%), Ghana (30%), Nigeria (40.6%), North East Nigeria (49.9%), South Korea (45%), Malaysia (32.8%), and Oman (50.5%) [31,43,44,46,47,48,49]; this might be due to socio-economical differences(presence of financial limitations in procuring glucometers and the rest of stock necessary for attainment of optimal self-care practice and glycemic control in societies like people living in this study area, presence of limited service providing health facility like this study area), attitude difference of diabetes patients towards self-care behavior such as self-monitoring of blood glucose, variation in professional character, cultural and technological difference as well among population in study areas.

Likewise of glycemic control, prevalence of good self-care practice in this study was much lower (24.9%) and it has thought to induce and fire the prevalence of poor glycemic control with its consequence such as permanent disabilities and premature death. These prevalence corroborates with a finding of study conducted in Nigeria (26.8%) [44]. However lower than studies conducted in Nepal (49.6%), Harare and Dire Dawa (39.1%), Bahir Dar (36.8%) [15,28,35]. These difference might be due to variation in accessibilities of infrastructure mainly serving clinic and hospital, financial limitations in procuring glucometers and the rest of stock necessary for attainment of optimal self-care practice including SMBG for diabetes patient in this study area and variation in attitude towards self-care practice as well.

Factors that are associated with glycemic control in multivariate logistic regression analysis workup and officially declared as independent predictors were age, diabetes complication, appointment adherence and glucometer. Regarding the first independent predictor, those who were on the age group of 33-46 had .039 times good glycemic control when compared to the age group 60 Year and above; this finding corroborates conclusion of study conducted in Oman [49] and contrary with the finding of study conducted in Malaysia, since adults who were belonged to younger age groups in Oman better controlled their blood glucose under the range of good glycemic control than those who were belonged to older age group [48]. These variation might be linked to the notion, difference in study year, Socio demographic character of study population and cultural aspect as well.

Regarding the second independent predictor, those who had no complication were 7.82 times attained good glycemic control than those who had developed complication; yet a study conducted in Sudan had argued a finding of this study by assuring, there is no statistically significant association between glycemic control and diabetes related factors [7]. These variation might be the part of theory such as variation in study design, study population and setting or might be linked to socio demographic and cultural aspect as well. Regarding the third independent predictor, those who had glucometer in their home had 11.42 times good glycemic control when compared with those who had no glucometer, however available studies failed to identify significant association between glucometer and glycemic control regardless a minute of them attempted to address these variable in their studies, these variation might be linked to socioeconomic and technological difference, of them; most probably financial limitation(for outnumbered others, the question might not be glucometer absence; so that scholars might not worry about these variable).

Regarding the fourth and last independent determinant for glycemic control, those who had adhered for appointment were 6.59 times attained good glycemic control than those who didn't adhered for appointment. Yet neither available studies included these variable in their study nor identified independent association, this gap might be linked to variation in behavior and attitude of diabetes patient(if positive attitude and behavior were attained for outnumbered study population, the authors might not obligated to incorporate with appointment adherence), variation in accessibilities of infrastructure mainly serving hospital for instance, only one public hospital serve diabetes follow up patient of the whole zone in this study area and patients were obligated to travel long distance to reach hospital for follow up and by this, they didn't came to hospital on time; so that this might be possible reason for outnumbered investigator to neglect appointment adherence, since there might be no gap in appointment adherence or coverage of serving health institutions in other study population except in setting like this study area.

On the area of self-care practice, factors associated with self-care practice in multivariate logistic regression and proved as independent predictors were education, diabetes complication, diabetes category, distance and appointment adherence. Regarding the first independent predictor, those who were illiterate had .172 times poor self-care practice than those who were attained College and above carrier; which became consistent with the study conducted in hospital of Bahir Dar Ethiopia since these study claimed, higher education and above had four times good practice of self-care compared to those who were unable to read and write however AOR was lower [15], this difference might be closed to variation in study year and methodologies. The finding on the other hand became contrary with study conducted in Asia like Iran and Africa region such as Eastern Sudan since they had said, there is no significant association between educational status and self-care practice [7, 50]; these difference might be linked to variation in socio demographic characteristics of study population.

Regarding the second independent predictor, those who were came from medium distance had 12.01 times good self-care practice than those who were travelled extremely far distance to reach hospital, likewise of appointment adherence in glycemic control: distance is among despised variables by outnumbered investigator in which none of available studies were incorporated and determined significant association. These gap might best fit with the theory stated for variation in appointment adherence in glycemic control as showen above (huge disparity created in coverage of infrastructure mainly serving health institution and appointment adherence between study population which might became the reason for many authors to underestimate these variables). Regarding the third independent predictor, those who didn't developed complication had 13.36 times good self-care practice when compared to those who had complication; available studies were declined to come with the same result and this might be due to difference in study population and gap in investigators outlook of the variable (since majority of scholars didn't included in their studies).

Regarding the fourth independent predictor, those who were diagnosed as type I diabetes were 11.085 times achieved good self-care practice than those who were diagnosed as type II diabetes. Likewise of diabetes complication, none of available studies came with the finding which is the same as finding of this study and the theory stated for diabetes complication as possible reason as above might be true for diabetes category. Regarding the fifth and last independent predictor for self-care practice, those who had adherence for appointment had also 6.19 times adherence for good self-care practice when compared to those respondents who didn't adhered for appointment. However none of investigators incorporated with these variable and attempted to identify significant association, similarly possible reason stated for it in glycemic control since it is also associated with glycemic control and for distance as above might be true again for it (appointment adherence).

On the area of association between glycemic control and self-care practice, medication adherence and overall self-care practice qualified multivariate logistic regression analysis workup and assured presence of independent association between glycemic control and self-care practice. Furthermore, those who were not adhered for medication were 6.42 times not adhered to good glycemic control and became consistent with a studies conducted in Oman and South West Nigeria [45, 49]. However this finding was higher than (4.26) study conducted in Sri Lanka [29] and the difference might be linked to socio demographic and economic variation: whereas lower than (13.632) the study conducted in South Korea [47] and these difference probably induced by Study Year and other methodological variation.

Generally regarding all self-care practice, the respondents who had poor self-care practice had also 14.25 times poor glycemic control when compared to those who had good self-care practice, which was consistent with a study conducted in Oman [49] and higher than (5.86) a study conducted in Nigeria [44]. These difference probably came from socioeconomic variation (Nigerian might had transformed culture and attitude, might be better economized, might had accessible both private and public hospital and in turn better attained good self-care practice).While the other studies such as investigation done in Cameroon and Guinea had documented the absence of significant association [8]. These variation might be the output of attaining good self-care practice by the patients, might reflects the quality and content of self-care related interventions enhancing strategies applied by health professional routinely to diabetes patient during their follow up visits.

Furthermore, since diabetes management is complex in nature, it questions inputs from both patients and health care providers as major impediment to achieve therapeutic glycemic control. Therefore, strategies aimed at improving glycemic control has to be again designed to management related to self-care practices among diabetes patients; health care providers on the other hand should include all aspects of self-care related intervention when managing people with diabetes in order to improve self-care practices, and hence, achieve optimal glycemic control.

CHAPTER SEVEN: STRENGTH AND LIMTATION OF THE STUDY

7.1. Strength of the study

- This study had identified independent association between glycemic control and overall self-care practice, which was the area that outnumbered investigators in Ethiopia didn't achieved except a minute of studies in the world,
- This study had investigated two prevalence with factors and might be the first study regarding this in Ethiopia and the second study in the whole world since only Nigerian investigator did this.
- The sample in this study better represent the study subjects in terms of size and technique
- Neglected and despised variables by outnumbered investigator became parts of this study
- This study had addressed by far outnumbered variables relatively
- This study might be generalizable for the whole Zone, since overall diabetes patients with in the zone better represented and systematic sampling technique was employed
- This study conducted in relatively the most raw or new study area
- High response rate of study participants
- The data in this study were collected by trained professional and diploma nurses with continuous supervision by supervisor and investigator as regularly daily basis.
- The data collection tool for this study was standardized, validated, adopted from similar previous studies and translated in to Amharic and Dawrogna version for relatively best control of biasis.

7.2. Limitation of the study

- Since the employed study design was cross sectional, this study findings cannot address issues of causal relationships
- Self-care practice of study participants were based on self-reports, and not observed
- Since the employed study design was cross sectional, it is difficult to confirm whether predictor or outcome occurred first.
- Possible risk of Social desirability bias secondary to sensitive and personal question related to diabetic self-care and socio demographic aspect such as income
- Limitation of related literatures in Ethiopia to compare and contrast the finding officially with the studies conducted in the country.

CHAPTER EIGHT: CONCLUSSION AND RECCOMENDATION

8.1. Conclusion

In addition to determining prevalence of glycemic control and self-care practice and identifying factors associated with them, the main aim of this study was to find out whether glycemic control and self-care practice affect one another or not. These question better responded since the study had showed poor self-care practice posed poor glycemic control in both descriptive and analytic part of the result. These significant association between them uncovered the intervention toward the gap has been under question and the need of maximal effort to enhance prevalence of good self-care, since intervention to ward self-care practice ease roads to good glycemic control and in turn save diabetes patients from the coming fatal consequences.

For further extension, prevalence of both good glycemic control and self-care practice were fallen under the range of extremely low (shine red lump) since it indicates majorities of the patients were closed to face premature death and permanent disabilities. Poor self-care practice and glycemic control have also serous impact on societies and the whole country, since it has hand on reduction of productive population via permanent disabilities. The predictors of glycemic control in this study included medical and non-medical components of diabetes management, this underscores available medical and non-medical prescriptive intervention including political approaches by stake holders. Overall, findings of this study will locate the gap in intervention and might became parts of possible strategies to improve the quality of life for people living with diabetes, since it might had hand on expanding evidence based practice by increasing the numbers of available literature.

8.2. Recommendation

For policy/decision makers (PMO, MOH, DIABETES SOCIETY and NGos)

A study had suggested that, there is a need for designing policies and programs aimed at transforming self-care practice and glycemic control status or has to develop guide line and outline training program supported by audiovisual aids. The implementers then should acknowledge and recognize that, self-care practice and glycemic control are major public health concern and accord transforming policy.

Furthermore it's better if maximal effort has to be used to break the cycle of low income to resolve deficit of materials necessary for self-care practice and in turn glycemic control such as glucometer. E.g. working with NGos and attempting free service like HIV AIDS or full filling vital instrument such as glucometer for seriously povered societies.

It's better if maximum struggle has to be done to come up with adequate coverage of serving hospital or to enhance material capacity of available two primary hospitals to enable them to serve diabetes follow up patients, since all patients in the whole zone served by only one hospital in this study area, which has played classical role for poor prevalence in both good self-care practice and glycemic control.

For Health professionals and health facilities including Health department

It's better if functional multidisciplinary teams composed of doctors, nurses, dieticians and diabetes educators. has to be organized and routinely assess self-care practice and monitor how diabetes patients are going to control their blood glucose.

It's better if all health care providers who are parts of management in diabetes clinic have to follow the patients status of self-care practice and glycemic control and regularly counsel them.

It's better for health professional to have a collaborative partnership with patients in order to promote the practice of self-care and glycemic control by patients.

It's better if diabetes health education team has to be formed and focal person has to be assigned to provide problem solving-centered self-management education supported by audio visual aids to people living with diabetes regularly without interruption.

It's better also for Health service managers if they have to identify the possible barriers of diabetes care and to come up with identified constraints as much as possible to prevent ultimate consequence of poor self-care practice and glycemic control such as permanent disabilities and premature death.

For researchers

It's better for researcher to conduct further studies, since there is a need for doing more and more researches at the national level aimed at glycemic control and self-care practice since there is inconsistency among the factors and to resolve series shortage of literatures on the area in Ethiopia.

It's also important to keep going on investigating this target population with better and different study design that can dig out determinant factors thoroughly and cast off potential bias possibly encountered in available literatures. Its again better for researcher to focus on neglected and raw study area that are not reached by outnumbered investigators by addressing many variables to come with unexpected new finding and for the seek of representativeness.

CHAPTER NINE: REFERENCES

[1] American diabetes association. Standards of medical care in diabetes and diabetes care. The journal of clinical research, applied research and education: Volume 4, 2018.

[2] Tao Z, Shi A, Zhao J. Epidemiological perspectives of diabetes: Cell Biochemistry and Biophysiology.73 (1):181–185; 2015.

[3]. World Atlas. The 10 Worst Epidemics in History. March 13, 2017. Accessed at: http://www.worldatlas.com/articles/the-10-worst-epidemics-in-history.html on 07.07.2017

[4]. WHO Mortality Database [online database]. Geneva: World Health Organization; (http://apps.who.int/ healthinfo/statistics/mortality/causeofdeath_query/, accessed 12 January 2016.

[5]. Ashutosh A Kakade1, Ipseeta R Mohanty1* and Sandeep Ra; Assessment of factors associated with poor glycemic control among patients with Diabetes mellitus India: Integr Obesity Diabetes, 2018 doi: 10.15761/IOD.1000209 Volume 4(3): 1- 7.

[6]. Riyadh A Alzaheb1 Abdullah H Altemani2; The prevalence and determinants of poor glycemic control among adults with diabetes mellitus in Saudi Arabi; Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy 2018

[7]. Saeed M. Omar, Imad R. Musa, Amir ElSouli and Ishag Adam: Prevalence, risk factors, and glycaemic control of diabetes mellitus in eastern Sudan: a community-based study. Ther Adv Endocrinol Metab 2019, Vol. 10: 1–8

[8]. Alioune Camaraab, Naby M.Baldéa, Joelle Sobngwi-Tambekouc, Andrél P.Kengned, Mansour M.DialloaAlain, P.K.Tchatchouae, Amadou Kakéa, Ngamani Sylviee, Beverley Balkauf, Fabrice Bonnetbgm, Eugène Sobngwieh; Poor glycemic control in diabetes in the South of the Sahara. https://doi.org/10.1016/j.diabres.2014

[9]. Karuranga S, Fernandes J, Huang Y, Malanda B. IDF Diabetes Atlas Eighth edition, International Diabetes Federation; 2018.

[10]. Zeleke Bonger1, Solomon Shiferaw2 and Eshetu Zerihun Tariku3;Adherence to diabetic self-care practices and its associated factors among patients with diabetes in Addis Ababa, Ethiopia; a cross sectional study: Greener J Med Sci; 3(6) 2014

[11]. Kasper L. Harrison's principle of internal medicine. 20th ed. Grew Hill Company; p. 2275–2311. 2019

[12]. Omolola E. Adepojua,* , Jane N. Bolina, Charles D. Phillipsa, Hongwei Zhaob, Robert L. Ohsfeldta, Darcy K. McMaughana, Janet W. Heldusera, and Samuel N. Forjuoh. Effects of diabetes self-management programs on time-to-hospitalization among patients with diabetes: a survival analysis model. Patient Education and Counseling, 95:111–117; 2014

[13]. Saurabh RamBihariLal Shrivastava, Prateek Saurabh Shrivastava and Jegadeesh Ramasamy. Role of self-care in management of diabetes mellitus: Journal of Diabetes & Metabolic Disorders 12-14; 2014.

[14]. Al Hayek A, Robert A, Al Dawish M, Zamzami M, Sam A, Alzaid A. Impact of education program on patient anxiety, depression, glycemic control and adherence to self-care and medication in diabetes: 20(2): 77-82. 2014.

[15]. Solomon Asnakew Feleke, Chalachew Misganaw Alemayehu, Hawult Taye Adane. Assessment of the Level and Associated Factors with Knowledge and Practice of Diabetes Mellitus among Diabetic Patients Attending at FelegeHiwot Hospital, Northwest Ethiopia. Clinical Medicine Research. Vol. 2, No. 6, 2013, pp. 110-120. doi: 10.11648/j.cmr.20130206.11

[16]. H. M. M Herath1, N. P. Weerasinghe2 , H. Dias1 and T. P. Weerarathna1; Knowledge, Attitude and Practice Related to Diabetes Mellitus among the General Public in Galle District in Southern Sri Lanka: A Pilot Study: BMC Public Health; 2017.

[17]. WHO Global report on diabetes: A summary, Department for Management of Noncommunicable Diseases, Disability, Violence and Injury Prevention, World Health Organization, 1211 Geneva, Switzerland: Year : 2016 | Volume : 1 | Issue : 1 | Page : 3-8.

[18]. Singapore Diabetes Statistics: www.healthhub.sg › diseases-and-conditions › Diabetes in Singapore – Health Hub 2018.

[19]. Surendra S Borgharkar, 1 Soma S Das2; Real-world evidence of glycemic control among patients with diabetes mellitus in India: the TIGHT study: BMJ Open Diab Res Care 2019;7:e000654. doi:10.1136/bmjdrc-2019-000654

[20]. https://www.who.int/news-room/fact-sheets/detail/diabetes: The global prevalence of diabetes* among adults...: Diabetes - World Health Organization 30 Oct 2018.

[21]. Bull Acad Natl Med.The burden of diabetes in Africa: a major public health problem); 195(6):1239-53; 1253-1254, Jun 2011

[22]. https://www.afro.who.int/health-topics/diabetes who Africa region 2016

[23]. Lead researcher Till Seuring, from UEA's Norwich Medical School said: (University of East Anglia.. Global economic impact of diabetes revealed in new study; November 23, 2019.

[24]. Tadele Amente (MSc), Tefera Belachew (PhD), Endalew Hailu (MSc), Negalign Berhanu (MSc, MBA); self-care practice and its predictors among adults with diabetes mellitus on follow up at Nekemte hospital diabetic clinic, west Ethiopia. World J Med Sci.; 2(3):11–16; 2014.

[25]. Vandenbosch J, Broucke S, and Schinckus L; the impact of health literacy on diabetes self-management education, Health Education Journal; 2018.

[26]. Mohammed G, Balisa M, Getu B, Ginenus F and Busha G; Self-care practices regarding diabetes among adult patients in West Ethiopia, 12:212; 2019.

[27]. Endalew H, Wudineh H, Mariam T, Zewdie B; Self-care practice and glycemic control amongst adults with diabetes at the Jimma University Specialized Hospital 09 May 2012.

[28]. Journal of Nobel Medical College, Self-care activities among patients with diabetes attending a tertiary care hospital in Biratnagar, Nepal -June 11-17; 2018.

[29].Meerigama A, Thamara D, and Rasika J, Diabetes Self-Care Activities and Glycemic Control among Adults with Diabetes in Sri Lanka; Journal of Biosciences and Medicines, 7, 99-111; 2019.

[30]. Allah Bukhsh1,2 Tahir Mehmood Khan1,2 Muhammad Sarfraz Nawaz3 Hafiz Sajjad Ahmed4 Kok Gan Chan5,6 Bey-Hing Goh1,2,7,8. Association of diabetes knowledge with glycemic control and self-care practices among Pakistani people with diabetes mellitus: Dove Press Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy 2019:121410

[31].Karam Padma, Samir D Bele, Trupti N Bodhare and Sameer Valsangkar; evaluation of knowledge and self-care practices in diabetic patients and their role in disease management in India: National Journal of Community Medicine Vol 3 Issue 1 Jan-March 2013.

[32]. Ana Beatriz Valverde Mendes Æ Joa ˜o Anto ˆnio Saraiva Fittipaldi Æ Raimundo Celestino Silva Neves Æ Anto ˆnio Roberto Chacra Æ Edson Duarte Moreira Jr. Prevalence and correlates of inadequate glycaemic control: results from a nationwide survey in 6,671 adults with diabetes in Brazil: Acta Diabetol (2010) 47:137–145.

[33]. Eyob Alemayehu Gebreyohannes, Adeladlew Kassie Netere and Sewunet Admasu Belachew: University of Gondar-College of Medicine and Health Sciences, Gondar, Ethiopia; Glycemic control among diabetic patients in Ethiopia: A systematic review and met analysis, PLOS ONE | https://doi.org/10.1371/journal.pone.0221790 August 27, 2019.

[34]. Tefera Kassahun, Tesfahun Eshetie and Hailay Gesesew. Factors associated with glycemic control among adult patients with diabetes mellitus: a cross-sectional survey in Jimma Hospital, Ethiopia: BMC Journal, 9:78 DOI 10.1186/s13104-016-1896-7: 2016.

[35]. Behailu Hawulte Ayele, Melkamu Merid Mengesha and Tewodros Tesfa: Predictors of self-care activities of outpatient diabetic residents in Harar and Dire Dawa: A hospital-based cross-sectional study; SAGE Open Medicine Volume 7: 1 –10, 2019.

[36]. Haftom Niguse, Goitom Belay, Girmatsion Fisseha, Tesfaye Desale and Goitom Gebremedhn:Self-care related knowledge, attitude, practice and associated factors among patients with diabetes in Ayder Comprehensive Specialized Hospital, North Ethiopia; BMC Res Notes (2019) 12:34.

[37]. Gobezie Temesgen Tegegne, Awoke Shiferaw, Belayneh Kefale Gelaw, Amsalu Degu Defersha, Minyahil Alebachew Woldu & Jimma Likisa Linjesa: Glycemic Control and Self-Care Practice among Ambulatory Diabetic Patients in Ambo General Hospital, West Showa, Ethiopia; Global Journal of Medical Research: B Pharma, Drug Discovery, Toxicology and Medicine Type: Double Blind Peer Reviewed International Research Journal Publisher: Global Journals Inc. (USA) Online ISSN: 2249-4618 & Print ISSN: 0975-5888; Volume 14 Issue 7 Version 1.0 Year 2015

[38]. Melba S. D'Souza, Subrahmanya N. Karkada, Ramesh Venkatesaperumal and Jansirani Natarajan. Self-Care Behaviours and Glycemic Control among Adults with Diabetes: GSTF Journal of Nursing and Health Care (JNHC) Vol.2 No.1, March 2015

[39]. WHO | Definition of key terms - World Health Organization https://www.who.int › pub › guidelines › arv 2014

[40]. Deborah J. Toobert, PhD Sarah E. Hampson, PhD Russell E. Glasgow, PhD: The Summary of Diabetes Self-Care Activities Measure Results from 7 studies and a revised scale; Diabetes Care 23:943–950, 2000.

[41]. Sugiharto, RN., Ph.D., Yu-Yun Hsu, RN, Ph.D. Deborah J. Toobert PhD, Shan-Tair Wang, PhD: the validity and reliability of the summary of diabetes self-care activities questionnaire: an Indonesian version; journal injec vol. 4 no. 1 June: 25-36; 2019.

[42]. Andreas Schmitt, Annika Gahr , Norbert Hermanns , Bernhard Kulzer , Jörg Huber and Thomas Haak: The Diabetes Self-Management Questionnaire (DSMQ): development and evaluation of an instrument to assess diabetes self-care activities associated with glycemic control; Schmitt et al. Health and Quality of Life Outcomes, 11:138 [http://www.hqlo.com/content/11/1/138. 2013](http://www.hqlo.com/content/11/1/138)

[43]panel.Linda,,M.MobulaabFred,StephenSarfocdKathryn,A.CarsonabGilbertBurnhambLyndaArthureDanielAnsongcdOseiSarfo-KantankacdJacobPlange-RhulefDavidOfori-Predictors of glycemic control in type-2 diabetes mellitus: Evidence from a multicenter study in Ghana Adjeig https://doi.org/10.1016/j.tmsr.2018.09.001

[44]. Nnena A. Osuji - Federal Medical Centre, Abeokuta, Nigeria, Oluwaseun S. Ojo - Federal Medical Centre, Abeokuta, Nigeria, Sunday O. Malomo - Federal Medical Centre, Abeokuta, Nigeria, Adegbola M. Ige - Federal Medical Centre, Abeokuta, Nigeria, Ademola O. Egunjobi - Federal Medical Centre, Abeokuta, Nigeria, Adesoji J. Adeyemo - Federal Medical Centre, Abeokuta, Nigeria. Glycaemic Control And Practice Of Self-Care Behaviors Among People With Type 2 Diabetes In Nigeria. Metrics powered by PLOS ALM/ OpenJournalSystems.com 2019.

[45] Olorunsola AM. Self-care practice and glycaemic control among type 2 diabetes patients in a secondary health care in the south-west, Nigeria. International Conference on Family Medicine and Family Physicians; 2017 Oct 16-17; Toronto, Canada. Arch Gen Intern Med. 2017;1(3):48.

[46] David EA, Aderemi-Williams RI, Soremekun RO, Nasiru IY, Auta A (2019) Glycemic Control and Its Determinants among Patients with Type 2 Diabetes in a Specialist Hospital in Northeast, Nigeria. SAJ Pharma Pharmacol 6: 105.

[47] Won-Hee Choi PhD, RN, Associate Professor[1] Yeong-Mi Seo PhD, RN, Assistant Professor[2] | Yeongmi Ha PhD, RN, Associate Professor: Evaluation of factors related to glycaemic control among South Korean patients with type 2 diabetes WILEY International journal of Nursing practice 2017.

[48] Nur Khairul Bariyyah MH1,2*, Bujang MA3, Baharum N1, Mastura I4 and Shah SA2: Self-Care Activities among Diabetic Patients and Factors Affecting Glycaemic Control in Primary Health Care, Malaysia. J Diabetes Clin Prac 2018, 1:1

[49] Melba S. D'Souza, Subrahmanya N. Karkada, Ramesh Venkatesaperumal and Jansirani Natarajan: Self-Care Behaviours and Glycemic Control among Adults with Type 2 Diabetes. GSTF Journal of Nursing and Health Care (JNHC) Vol.2 No.1, March 2015

[50] Mohammad Ali Bigdeli1 *Seyed Saeed Hashemi Nazari2 Soheila Khodakarim3 Hamid Brodati4: Factors affecting the self-care in patients with type II diabetes using path analysis. Iranian Journal of Health Sciences 2016; 4(3): 10-21.

CHAPTER TEN: ANEXES

ANNEX A: English version information sheet

Title of the Research proposal: Glycemic control and self-care practice

Name of Investigator: Bizuayehu Atinafu

Name of the Organization: Addis Ababa University

Name of the Sponsor: Wolayta Sodo University

Introduction: this information sheet is prepared for _________ Hospital, _____. The aim of the form is to make the above concerned office clear about the purpose of research, data collection procedures and get permission to conduct the research.

Purpose of the Research thesis: To asses' glycemic control and self-care practice of participant and to provide feedback based on identified gap.

Procedure: The sample collection is easy and straight forward; data collected using standardized questioner trained Nurses, Participant willingness identified, all rights reserved and the data collected after permission

Risk and /or Discomfort: There will be no any risk associated during data collection

Benefits: Aids participant to identify their status of glucose control and self-care practice and to adjust their treatment plan based on identified gap.

Confidentiality: Participants name might not be stated and confidentiality reserved

Person to contact: This research project will be reviewed and approved by the institutional review board of college of health sciences, school of nursing and midwifery, Addis Ababa University. If in case you want to know more information about the research and its undertakings, you can contact the committee through the address below.

1. Zeleke Argaw (BSc, MSN, Assistant Prof): Addis Ababa University, college of health sciences, school of nursing and midwifery. Tel: 0911478796

2. Boka Dugassa (BSc, MSc): Addis Ababa University, college of health sciences, school of nursing and midwifery.Tell:___________________- ,e-mail:

3. Bizuayehu Atinafu (BSCN): Wolayta Univeristy.Tel:+251979836012, **E-mail:**bizuayehuatinafu@gmail.com

Permission: Lastly but not least, you are kindly requested to permit and forward your permission to concerned body in your organization so that the researchers can get cooperation from the data clerks and other responsible bodies in place.

ANNEX B: Amharic version information sheet

የምርምር አቅርቦቱ ርዕስ-የስኳር ቁጥጥር እና የራስ እንክብካቤ ልምምድ

የመርማሪ ስም: ብዙአየሁ አጠናፉ

የድርጅቱ ስም-የአዲስ አበባ ዩኒቨርሲቲ

የስፖንሰር ሰጪው ስም-ወላይታ ሶዶ ዩኒቨርሲቲ

መግቢያ: ይህ የመረጃ ወረቀት ለ __________ ሆስፒታል ፣ ______ ተዘጋጅቷል ። የቅጹ ዓላማ ከላይ የተጠቀሰውን የሚመለከተውን ጽ / ቤት ስለ ምርምር ዓላማ ፣ ስለ መረጃ አሰባሰብ አሰራሮች ዓላማ ግልፅ ለማድረግ እና ምርምር ለማካሄድ ፈቃድ ማግኘት ነው ፡

ምርምር ፅንሰ-ሀሳብ ዓላማ: የtሳታፊውን የግሉኮሰ ቁጥጥር እና የራስ-አያያዝ ልምድን ለመመርመር እና በተለየ ክፍተት ላይ የተመሠረተ ግብረመልስ ለመስጠት።

ሂደት-የናሙናው ስብስብ ቀላል እና ቀጥ ያለ ነው ፣ ደረጃውን በጠበቀ ጠያቂ የሰለጠኑ ነርሶችን በመጠቀም መረጃ መሰብሰብ፣ የተሳታፍውን ፈቃደኝነትን መለየት ፣ ሁሉም መብቶች እንደተጠበቁ ማሳወቅና እና ከፈቀዱ በኋላ መረጃ መሰብሰብ
ስጋት: -በመረጃ ማሰባሰብ ጊዜ ምንም ዓይነት አደጋ አይኖርም
ጥቅሞች-የተሳታፊውን የስኳር ቁጥጥር እና የራስ እንክብካቤ ልምምድ ሁኔታን ለመለየት እና በተለዩ ክፍተቶች ላይ በመመስረት የሕክምና ዕቅዱን ለማስተካከል ይረዳል ።
ምስጢራዊነት-የተሳታፊዎች ስም ሊገለጽ አይችልም እና ምስጢራዊነት የተጠበቀ ነው

የሚያነጋግረው ሰው-ይህ የምርምር ፕሮጀክት በጤና ሳይንስ ኮሌጅ ፣ ነርሶች እና አዋላጅ ተቋማት ትምህርት ቤት በተቋማዊ የግምገማ ቦርድ ተገምግሞ ፀድቋዋል ። ስለ ምርምሩ እና ስለ ሥራው አፈፃፀም የበለጠ መረጃ ለማወቅ ከፈለጉ ከዚህ በታች ባለው አድራሻ ኮሚቴውን ማነጋገር ይችላሉ ።

1. ዘለቀ አርጋዉ (ቢ.ኤስ.ሲ ፣ ኤም.ኤን.ኤን. ፣ ረዳት ፕሮፌሰር)-የአዲስ አበባ ዩኒቨርሲቲ ፣ የጤና ሳይንስ ኮሌጅ ፣ የነርሶች እና አዋላጅ ትምህርት ቤት.. ስልክ: +25111478796

2. በካ ዱጋሳ (ቢ.ኤስ.ሲ ፣ ኤምሲሲ)-አዲስ አበባ ዩኒቨርስቲ ፣ የጤና ሳይንስ ኮሌጅ ፣ የነርሶች እና አዋላጅ ትምህርት ቤት. ስልክ: +251913132398-
3. ብዙአየሁ አጠናፉ: ወላይታ ሶዶ ዩኒቨርሲቲ፣ ሰልክ+251979836012 ፈቃድ- በመጨረሻ ግን ባይሆንም ተመራማሪዎቹ በቦታው ካሉ የመረጃ ጸሐፊዎች እና ሌሎች ኃላፊነት ካላቸው አካላት ትብብር እንዲያገኙ የሚያስችል በድርጅትዎ ውስጥ ለሚመለከተው አካል ፈቃድ እንዲሰጡ እና እንዲያስተላልፉ በደግነት ተጠየቁ ።

ANNEX C: English version consent

Structured questionnaire for assessing glycemic control and self-care practice among diabetic patients at Tercha General Hospital

Greeting:

My name is ___________________ I am currently a post graduate student in Addis Ababa University, Department of Adult health nursing. Objective of the study is to assess glycemic control and self care practice among diabetic patients at Tercha General hospital

This will help to improve our community health based on your answers to our questions. You will be asked to fill a questionnaire that will help in investigating the issues. And also we request your willingness. Your co-operation is very helpful. Your name will not be written on the questionnaire and all the information you will provide will be kept strictly confidential.

You will be facing no harm by participating and you are also not obliged to answer any question you don't wish to answer. To fill the questionnaire 25-30 minutes will be required.

Consent Form

Considering the information you get from the general information sheet, we would be Thankful if you spend some time with us solving questions related to the issues. Are you Comfortable to participate in this study?

1. If yes, continue to next page
2. If no, skip to other participant

Informed consent certified by

Questionnaire collector: Code_____ Name_____________ Signature______ Date________

Checked by: Supervisor Signature_________

Questionnaire identification number____________

Address: city/Sub city _______ Woreda ________Medical Card Number__________

ANNEX D: Amharic version consent

በተርጨ አጠቃላይ ሆስፒታል ውስጥ በስኳር ህመምተኞች መካከል የስኳር ቁጥጥር እና ራስ እንክብካቤ ልምምድን ለመገምገም የተጠናቀረ መጠይቅ

ሰላምታ

ስሜ ____________________ በአሁኑ ወቅት በአዲስ አበባ ዩኒቨርሲቲ የአዋቂዎች ጤና ነርሶች ክፍል ውስጥ የድህረ ምረቃ ተማሪ ነኝ ። የጥናቱ ዓላማ በስኳር ህመምተኞች መካከል በተርጨ አጠቃላይ ሆስፒታል ውስጥ የስኳር ቁጥጥር እና ራስ እንክብካቤ ልምምድን መገምገም ነው

ይህ ለጥያቄዎቻችን በሚሰጡት መልስ ላይ በመመርኮዝ የህብረተሰባችንን ጤና ለማሻሻል ይረዳል ። ጉዳዮችን ለመመርመር የሚረዳ መጠይቅ እንዲሞሉ ይጠየቃሉ። ደግሞም ፈቃደኝነትዎን እንጠይቃለን። ትብብርዎ በጣም ይረዳል። ስም መጠይቅ ላይ አይፃፍም እና የሚሰጡት መረጃ ሁሉ በጥብቅ በሚስጢር የተጠበቀ ይሆናል ።

በመሳተፍ ምንም ዓይነት ጉዳት አይገጥሙዎትም እንዲሁም መመለስ የማይፈልጉትን ማንኛውንም ጥያቄ የመመለስ ግዴታ የለብዎትም ። መጠይቁን ለመሙላት ከ 15 እስከ 20 ደቂቃዎች ያስፈልጋል ።

የፈቃድ ቅጽ

ከጠቅላላ የመረጃ ወረቀቱ ያገኙትን መረጃ ከግምት ውስጥ በማስገባት ከስኳር ቁጥጥር እና ራስ እንክብካቤ ልምምድ ጋር የተዛመዱ ጥያቄዎችን በመመለሰ ጊዜዎን ቢያሳልፉ አመስጋኞች ነን ። በጥናቱ ለመሳተፍ ፍቃደኛ ነዎት?

1. አዎ ከሆነ ወደሚቀጥለው ገጽ ይቀጥሉ

2. አይደለሁም ከሆነ ፣ ወደሌላ ተሳታፊ ይዝለሉ

በመረጃ የተረጋገጠ ስምምነት

በመጠይቅ ሰብሳቢዎች-ኮድ______ ስም______________ ፊርማ_______ ቀን_________

የተረጋገጠው በ: -------ተቆጣጣሪ ፊርማ__________

መጠይቅ መታወቂያ ቁጥር _____

አድራሻ: ከተማ / ክፍለ ከተማ ________ ወረዳ _________ህክምና ካርድ ቁ___________

ANNEX E: Glycemic control and self-care practice English version questionnaire

No	I Socio demographic characteristics	Response classification	Code
1	Sex of the respondents	Male Female	1 2
2	Age (years)	----------	
3	What is your marital status?	Single Married Divorced Widowed Other specify ----------------------	1 2 3 4 5
4	Where is your place of residence?	Urban Rural	1 2
5	What is your last level of education?	Illiterate Grade 1-8 Grade 9-12 College and above	0 1 2 3
6	What is your current occupation?	Farmer Civil servant Merchant Housewife No job Other specify…………….	0 1 2 3 4 5
7	What is your Religion?	Protestant Orthodox Muslim Pagan Other specify-------------	0 1 2 3 4
8	What is your Ethnicity?	Dawro Oromo Amara Other Specify--------	0 1 2 3
9	How much income you earn monthly? (Ethiopian Birr)	----------	

10	Distance in Km from home to hospital	---------	
II. Diabetes related Clinical Factors			
1.	Duration of diabetes	---------	
2	Is there anyone who is diagnosed for diabetes mellitus in your family?	Yes No I don't know	0 1 2
3. 4. 5.	Height Weight BMI (body mass index)	--------- --------- ---------	
6.	Fasting blood sugar value;	Visit I ------ Visit II------- Visit II-------	
7.	What medication currently you have taking?	No Medication OHA* Insulin OHA + insulin	0 1 2
8.	Diabetes complication	No complication 1 complication 2 complication and above	0 1 2
9.	Types of diabetes Mellitus	Type I Type II Other specify--------	0 1 2
10.	Presence of comorbidity	No Yes	0 1
11.	Currently do you have your own glucometer at home?	Yes No	0 1
12.	What was your age during diagnosis?	--------	
13.	Do you come on day of appointment?	Yes No	0 1

Part III: Summary of diabetes self-care activities questionnaires: The questions below ask you about your diabetes self-care activities during the past 7 days. If you were sick during the past 7 days, please think back to the 7 days that you were not sick.

	Diet	**Number of days**						
		1	2	3	4	5	6	7
1	How many of the last SEVEN DAYS have you followed a healthful eating plan?							
2	On average over the past month, how many DAYS PER WEEK have you followed your eating plan?							
3	On how many of the last SEVEN DAYS did you eat five or more servings of fruits and vegetables?							
4	On how many of the last SEVEN DAYS did you eat high fat foods Such as red meat or full fat dairy products?							
5	On how many of the last SEVEN DAYS did you space carbohydrates evenly through the day?							
	Physical Activity							
1	On how many of the last SEVEN DAYS did you participate in at least 30 minutes of physical activity?(total minutes of continuous activity, including walking)							
2	On how many of the last SEVEN DAYS did you participate in a specific exercise session (such as swimming, walking, biking) other than what you do around the house or as part of your work?							
	Self-monitoring of blood glucose							
1	On how many of the last SEVEN DAYS did you test your blood							
	sugar?							

2	On how many of the last SEVEN DAYS did you test your blood sugar the number of times recommended by your health care provider?							
	Foot care							
1	On how many of the last SEVEN DAYS did you check your feet?							
2	On how many of the last SEVEN DAYS did you inspect the inside of your shoes?							
3	On how many of the last SEVEN DAYS did you wash your feet?							
4	On how many of the last SEVEN DAYS did you soak your feet?							
5	On how many of the last SEVEN DAYS did you dry between your toes after washing?							
	Medication adherance							
1	On how many of the last SEVEN DAYS did you take your recommended diabetes mellitus?							
2	On how many of the last SEVEN DAYS did you take your recommended insulin injections?							
3	On how many of the last SEVEN DAYS did you take your recommended number of diabetes pills?							
	Smoking and Alcohol							
1 2	Have you smoked a cigarette, even a puff in the past SEVEN DAYS? Have you drink alcohol in the last SEVEN DAYS?							

Part IV: Self-care recommendations

1.Which of the following has your health care team (doctor, nurse, dietitian, or diabetes educator) advised you to do? Please check all that apply:

a. Follow a low fat eating plan☐

b. Follow a complex carbohydrate diet ☐

c. Reduce the number of calories you eat to lose weight ☐

d. Eat lots of food high in dietary fiber ☐

e. Eat lots (at least 5 servings per day) of fruits and vegetables ☐

f. Eat very few sweets (for example desserts, non diet sodas, candy bars) ☐

g. Other (specify): _______________

h. I have not been given any advice about may diet by my health care team ☐

2.Which of the following has your health care team (doctor, nurse, dietitian or diabetes educator) advised you to do? Please check all that apply:

a. Get low level exercise (such as walking) on a daily basis ☐

b. Exercise continuously for at least 20 minutes at least 3 times a week ☐

c. Fit exercise into your daily routine (for example, take stairs instead of elevators park a block away and walk) ☐

d. Engage in a specific amount, type, duration, and level of exercise ☐

e. Other (specify) : _________________________

f. I have not been given any advice about exercise by my health care team ☐

3.Which of the following has your health care team (doctor, nurse, dietitian, or diabetes educator) advised you to do? Please check all that apply:

a. Test your blood sugar using a drop of blood from your finger and color change ☐

b. Test your blood sugar using a machine to read the results ☐

c. Test your urine for sugar ☐

d. Other (specify): _____________________

e. I have not been given any advice about my blood or urine sugar level by my health care team. ☐

4.Which of the following medications for your diabetes has your doctor prescribed? Please check all that apply:

a. An insulin shot 1 or 2 times a day ☐

b. An insulin shot 3 or more times a day ☐

c. Diabetes pills to control my blood sugar level ☐

d. Other (specify): ________________________

e. I have not been prescribed either insulin or pills for my diabetes

5.At your last doctor's visit, did anyone ask about your smoking status?

No ☐ Yes ☐

6. If you smoke, at your last doctor's visit, did anyone counsel you about stopping smoking or offer to refer you to a stop smoking program?

No ☐ Yes ☐

7. When did you last smoke a cigarette?

a. More than two years ago or never smoked ☐

b. One to two years ago ☐

c. Four to twelve months ago ☐

d. One to three months ago ☐

e. Within the last month ☐

f. Today ☐

Thank you very much for giving this valuable information & your precious time!

ANNEX F: Glycemic control and self-care practice Amharic version questionnaire

ጥያቄዎችና መልሶች

ተ.ቁ	ክፍል I: ማህበራዊና ስነ ሕዝብ አወቃቀር ባህሪዎች ተያያዥ መረጃዎች	የምላሽ ምደባ	መልሰ(ኮድ)
1	የመልስ ሰጪዎች ፆታ	ወንድ ሴት	1 2
2	እድሜ (በአመት)		---------
3	የጋብቻ ሁኔታዎ ምንድ ነው?	ያገቡ ያላገቡ አግብተው የፈቱ የትዳር አጋራቸው የሞተባቸው ሌላ ካለ ይግለጹ ----------------------	1 2 3 4 5
4	የመኖሪያ በታዎ የት ነው? -	ከተማ ገጠር	1 2
5	የመጨረሻው የትምህርት ደረጃዎ ምንድ ነው?	ማንበብና መፃፍ የማይችሉ ክፍል 1-8 9-12 ኛ ክፍል ኮሌጅ እና ከዚያ በላይ	1 2 3 4
6	የአሁኑ ሥራዎ ምንድ ነው?	ገበሬ የመንግስት ሰራተኛ ነጋዴ የቤት እመቤት ስራ የለም ሌላ ይግለጹ	1 2 3 4 5 6
7	ሃይማኖትዎ ምንድን ነው?	ፕሮቴስታንት ኦርቶዶክስ ሙስሊም ሌላ ካለ ይግለጹ --------------	1 2 3 4
8	ብሔርዎ ምንድ ነው?	ዳውሮ ኦሮሞ አማራ ሌላ ካለ ይግለጹ --------	0 1 2 3
9	በየወሩ ምን ያህል ገቢ ያገኛሉ? (በኢትዮጵያ ብር)		---------
10	ከቤትዎ እሰከ ሆሰፒታል ድረሰ የለው ርቀት በኪሜ		----------
	ክፍልII፡ ከስኳር በሽታ ጋር የተዛመዱ ጥያቄዎች		
1.	የስኳር በሽታ ቆይታ(በአመት)		----------

2	በቤተሰብዎ ውስጥ የስኳር ህመምተኛ አለ?	አዎ የለም አላውቅም	1 2 3
3 4 5	ክብደት በኪሎ ግራም ቁመት በሜትር ቢ ኤምአይ (የሰውነት ብዛት ማውጫ)		________ ________ --------------
6.	ከጾም በኋላ የደም ስኳር መጠን; ሦስት ጉብኝት		------------- ________ -------------
7.	በአሁኑ ጊዜ ምን ዓይነት መድሃኒት እየወሰዱ ነው?	መድሃኒት አልወስድም የሚዋጥ መድኃኒት ኢንሱሊን የሚዋጥ መድኃኒትና ኢንሱሊን	1 2 3 4
8.	በህክምና የተረጋገጠ በስኳር ህመም ምክንያት የመጣ የተወሳሰበ ችግር (ስኳር ህመም ኮምፕልከሽን) አሌዎት?	ምንም የተወሳሰበ ችግር የለም 1 የተወሳሰበ ችግር 2ና በላየ የተወሳሰበ ችግር	1 2 3
9.	የስኳር በሽታ ዓይነት	ዓይነት I ዓይነት II ሌላ ካለ ይግለጹ -------	1 2 3
10.	ተጨማሪ በሽታ ሰለ መኖር	የለም 1 2 እና ከዚያ በላይ	1 2 3
11.	በአሁን ጊዜ በቤትዎ የደም ግሉኮስ መጠን የሚለካ መሳሪያ አለዎት?	አዎ የለም	1 2
12.	ህመሙ ሲጀመር የነበርዎት እድሜ		-------
13.	የክትትል ቀጠሮን የከብራሉ	አዎ አላከብርም	1 2

ክፍል III: ስኳር ህመም የግል እንክብካቤ ተግባራት መጠይቅ

ከዚህ በታች የተዘረዘሩት ጥያቄዎች ባለፉት ሰባት ቀናት ውስጥ ስለ ስኳር ህመምዎ የግል እንክብካቤ ተግባራትን በተመለከተ ምን እንደሚመስል የሚጠይቁ ናቸው። ሆኖም ግን ባለፉት 7 ቀናት ውስጥ ታመው ከነበሩና እራስዎ በራስዎ መንከባከብ ካልቻሉ ተጨማሪ 7 ቀናት ወደኋሊ በመሄድ ጤነኛ በነበሩበት ጊዜ ያደረጉት እንክብካቤ ሁኔታ መውሰድ ይችላሉ።

	አመጋገብን በተመለከተ	**የቀናት ብዛት አማራጭ መልሶች**								**መልሰ**
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	
1	ባለፉት 7 ቀናት ውስጥ ምን ያህል ቀን/ናት ነው ጤነኛ አመጋገብ እቅድ የነበርዎት?									
2	በአማካኝ ባለፈው ወር ምን ያህል ቀን/ናት በሳምንት ውስጥ ይህን የአመጋገብ እቅድዎን ይከተላሉ?									

3	ባለፉት 7 ቀናት ውስጥ ምን ያህል ቀን/ናት 5 እና ከዚያ በላይ ጊዜ አትክልትና ፍራፍሬ ተመግበዋሉ?									
4	ባለፉት 7 ቀናተ ውስጥ ምን ያህል ቀን/ናት ከፍተኛ የስብ መጠን ያለው ምግብ ይመገባሉ፣ /ለምሳላ ቀይ ሥጋ ወይም በስብ የተሞላ የእንስሳት ተዋጾኦ?/ (ፆም ከመጀመሩ በፍት ያለው ጊዜ ወሰደዋሉ)									
5	ባለፉት 7 ቀናት ውስጥ ምን ያህል ቀን/ቀናት ነው ሀይል ሰጪ ምግብ በአንድ ቀን ውስጥ በእኩል በማመጣጠን የወሰዱ?									
	የአካል እንቅስቃሴ ማድረግ በተመለከተ									
1	ባለፉት 7 ቀናት ውስጥ ምን ያህል ቀን/ናት ለ30 ደቂቃ ያክል የአካል እንቅስቃሴ ተሳትፈዋሉ (ሁሉም እንቅስቃሴ፣ ወክን ጨምሮ፣ ጠቅላላ ደቂቃ)?									
2	ባለፉት 7 ቀናት ውስጥ ምን ያክል ቀን/ናት በተወሰኑ የአካሌ እንቅስቃሴ ተሳትፈዋሉ? ይህም ቤት ውስጥና ስራ ቦታ ከሚያረጉት እንቅስቃሴ ውጭ									
	የደም ስኳር መጠን ምርመራና ክትትልን ማድረግ በተመለከተ									
1	ባለፉት 7 ቀናት ውስጥ ምን ያክል ቀን/ናት የስኳር መጠን መርመራ አካሂደዋሉ (ቤትም ከቤት ውጭም)?									
2	ባለፉት 7 ቀናት ውስጥ ምን ያክል ቀን/ናት የጤና ባለሙያዎ በነገርዎት ብዛት ልክ የስኳር መጠን ምርመራ ያካሂዳሉ?									
	እግርና የእግር ጣቶች እንክብካቤን በተመለከተ									
1	ባለፉት 7 ቀናት ውስጥ ምን ያህል ቀን/ናት እግሮትዎና የእግርዎ ጣቶች መሀል ፍተሻ ያረጋሉ?									
2	ባለፉት 7 ቀናት ውስጥ ምን ያህል ቀን/ናት የጫማዎ ውስጥ ክፍል ምልከታ /ፍተሻ ያረጋሉ?									
3	ባለፉት 7 ቀናት ውስጥ ምን ያህል ቀን/ናት ነው እግርዎትን የታጠቡት?									
4	ባለፉት 7 ቀናት ውስጥ ምን ያህል ቀን/ናት ነው እግሮችዎን የዘፈዘፉት?									
5	ባለፉት 7 ቀናት ውስጥ ምን ያህል ቀን/ናት ነው ከታጠቡ በኋሊ እግሮችዎና የእግሮችዎን ጣቶች መሃል በለስላሳ ፎጣ እንዲደርቅ የሚያደርጉት?									
	መድኃኒት አወሳሰድ ልምድ በተመለከተ									
1	ባለፉት 7 ቀናት ውስጥ ምን ያህል ቀን/ናት ነው የታዘዘልዎትን መድኃኒት በትክክል የወሰዱት?									
2	ባለፉት 7 ቀናት ውስጥ ምን ያህል ቀን/ናት ነው የታዘዘልዎትን መርፌ በትክክል (መጠን፣ ጊዜ፣ ሰአት) የወሰዱት?									
3	ባለፉት 7 ቀናት ውስጥ ምን ያህል ቀን/ናት ነው የታዘዘልዎትን ክኒን በትክክል (መጠን፣ ጊዜ፣ሰአት) የወሰዱት?									
	አልኮልና ሲጋራ ማጨስን በተመለከተ									
1	ባለፉት 7 ቀናት ውስጥ ሲጋራ አጭሰዋል? ለአንድ ጊዜም ቢሆን?									
2	ባለፉት 7 ቀናት ውስጥ አልኮል ጠጥተዋል?									

ክፍል IV: ስለ ግል እንክብካቤዎ ምክሮችን በተመለከተ

1	ወደ ጎን ከተዘረዘሩት ውስጥ በጤና ባለሙያ ተግባራዊ እንድደረጉ የተመከሩ የትኞቹ ናቸው (የተመከሩትን ሁሉ ይምረጡ)	1. ዝቅተኛ የስብ መጠን ያለው አመጋገብ 2. ኮምፕለክስ ካርቦ ሀይድሬት ምግብ መመገብ 3. ክብደትን ለመቀነስ የካሎሪ መጠን መቀነሰ 4. ፋይበር መጠናቸው ከፍተኛ የሆኑት ምግቦች ማዘውተር 5. መጠኑ ከፍተኛ የሆነ አትክልትና ፈራፈሬ /በቀን እስከ 5 ጊዜ/ መመገብ 6. መጠኑ ዝቅተኛ የሆነ ጣፋጭ ምግቦች መውሰድ 7. ለላ ካለ ይጥቀሱ 8. ምንም አይነት ምክር አላገኘሁም	
2	ከዚህ በታች ከተዘረዘሩት ውስጥ በጤና ባለሙያ ተግባራዊ እንዲያደርጉ የተመከሩት የትኞቹ ናቸው (የተመከሩትን ሁለ ይምረጡ)	1. በየቀኑ ዝቅተኛ ደረጃ የአካሌ እንቅስቃሴ ማድረግ 2. ቀጣይነት ባለው ቢያንስ በሳምንት ሶስት ጊዜ ለ20 ደቂቃ የአካል እንቅስቃሴ ማድረግ 3. በእለት ተእለት ተግባራት ውስጥ የአካል እንቅስቃሴ ማካተት 4. በመጠን፣ በአይነት፣ ጊዜ፣ ደረጃ ውስን የሆነ የአካል እንቅስቃሴ ራስህን መጥመድ 5. ለላ ካለ ይጥቀሱ 6. ምንም አይነት ምክር አላገኘሁም	
3	ከዚህ በታች ከተዘረዘሩት ውስጥ በጤና ባለሙያ ተግባራዊ እንዲያደርጉ የተመከሩት የትኞቹ ናቸው (የተመከሩትን ሁለ ይምረጡ)	1. ከለር ቻርት በመጠቀም ጠብታ ደም ተጠቅሞ ስኳርን ሰለ መለካት 2. ግሉኮሜትር በመጠቀም በደም የስኳር መጠን መለካት 3. በሽንትዎ ስኳር መኖሩን መመርመር 4. ለላ ካለ ይጥቀሱ 5. ምንም አይነት ምክር አላገኘሁም	
4	በአሁኑ ጊዜ ምን ዓይነት መድሃኒት እየወሰዱ ነው?	1. የኢንሱሊን መርፈ በቀን 1 ወይንም 2 ጊዜ ሰለ መውሰድ 2. ኢንሱሊን መርፈ በቀን 3 እና ከዚያም በሊይ ጊዜ ሰለ መውሰድ 3. የስኳር መጠን ለመቆጣጠር የስኳር ህመም መድኃኒት ክኒን መውሰድ 4. ለላ ካለ ይጥቀሱ 5. ምንም አይነት ምክር አላገኘሁም	
5	ባለፈው የህክምና ቀጠሮወ ጊዜ ስለ ሲጋራ ማጨስ የጠየቅዎት ጤና ባለሙያ አለ?	0. የለም 1. አለ	
6	ሲጋራ የሚያጨሱ ከሆነ ባለፈው ህክምና ቀጠሮ ጊዜ ስለ ሲጋራ ማጨስ ማቆም የመከርዎ ሰው አለ? ወይም ይህን ጉዳይ የሚመለከተው ኦፉሰር ወደ ሲጋራ ማጨስ ማቆም ፕሮግራም ሪፈር ያደረግዎት አለ?	0. የለም 1. አለ 2. ሲጋራ አላጨስም	
7	ለመጨረሻ ጊዜ ሲጋራ ያጨሱት መቼ ነው?	1. ከ2 ዓመት በሊይ በፉት ወይም አጭሴ አላቅም 2. ከ1 እስከ 2 ዓመት በፉት 3. ከ4 እስከ 12 ወራት በፉት 4. ከ1 እስከ 3 ወራት በፉት 5. በባለፈው ወር ውስጥ 6. ዛሬ	

ይህንን ጠቃሚ መረጃ እና ውድ ጊዜዎን ስለሰጡን በጣም እናመሰግናለን!

ANNEX G: Dawrogna version information sheet

Pilgi xeelaa huuphe kaaraa- barena oytha meeziya ne bare suutha sukaariya kaali xeeliya maara

Pilgi xeeliyaa uraa sunthaa: Buzayo Axinaapo

Oothisiya keetha sunthaa-Adisaaba Yunberestiyaa

Pilgi xeela maadiya keetha sunthaa-Wolaytha Soodo Yunberestiyaa

Geluwaa: Ha marajaa woraqatay Tarcha kumentha Aspidaaliyasi giigeeda ፡፡ Ha woraqataw huuphe gaasu kilina uteeda xaafo keethaw, oosha zaaruwa shiishuwaa gaasuwa qoncisanaw ne pilgi xeeluwa doomanasa.

Pilgi xeelaw waana yewuwa huuphe gaasuwa: - barena oytha meeziya ne bare suutha sukaariya kaali xeeliya maara pilganasi ne beeteeda pacatethan zenbite biletha zaaruwa immanasa.

Ogiyaa-Ha ooshay qalaaliya ne suuriya. Ereteeda Narsiyaa hiilanchata go etiide zaaruwa shiishusa, Asatu eenota dumayi erusaa, Uba maatayika naageteedawa erisusa ne eeno goowape guyiyan zaaruwa shiishussa.
Yashatuwa: -Zaaruwa shiishiya ogiyan ayi agadayka baawa.
Goaa- barena oytha meeziya ne bare suutha sukaariya kaali xeeliya maara detha dumayusa ne beeteeda pacatuwan zempiide halchuwa giigisanaydan maadusa.

Xuura naaguwa: beetiya asa sunthay koncanaw dandayena, qasi xuuray naageteedawa

Oochiya asaa-Ha pilgi xeelay paxatetha saynisiyaa kollegiyaan, yelisusa hiilanchatuwa ne narsatuwa timirte keethan kaali xeeliya bordiyaan xeeleti dhiisheteeda. Pilgi xeelana gaketeeda yewuwane poluwa maaraa loythi eranaw koyoope hirkina konceteeda maabaratuwa silkiyaan shociide haasayisanaw dandayiita.

1. Zallaqaa Aragaa (Koyro digiriyaa, Laa etha digiriyaa, Maadiya Piropeseriyaa)-Adisaaba Yunberestiyaan, Paxatetha saynisiyaa kollegiyaan, Narsatuwaa ne Yelisiya hiilanchatuwa timirte keethan. Silkii: +25111478796

2. Bokka Dugaasa (Koyro digiriyaa, Laa etha digiriyaa Adisaaba Yunberestiyaan, Paxatetha saynisiyaa kollegiyaan, Narsatuwaa ne Yelisiya hiilanchatuwa timirte keethan. Silkii: +251913132398-
3. Buxaayo Axinaapa: Wolayitha Soodo Yunberestiyaan. Silkii+251979836012

Eenota- Wursethan pilgi xeeliywantu marajaa oyqiyaawantupe ne hara maatay de eya uraape maaduwa demanayda udisiya hinte ooso keethan koshiyaa uray eenota imanaada udisanaw ashketethan ooshetite.

ANNEX H: Dawrogna version consent

Tarcha kumentha aspidaaliya gidon de eya sukaariya harganchatu barena oytha meeziya ne bare suutha sukaariya kaali xeeliya maara eranaw giigeeda oosha

Sarotaa

Ta sunthay ____________________ ha wodiyan Addisaaba yunberestiyaan yalagatu paxatesha narsingiya tamaariya. Ha pilgi xeelaw huuphe gaasu Tarcha kumentha aspidaaliya gidon de eya sukaariya harganchatu barena oytha meeziya ne bare suutha sukaariya kaali xeeliya maara eranasa.

Heweka beetiya zaaaruwan zempiide heera asa paxatetha laamanaw maadee. Hewa eranaw zaaruwa imanayda ooshetita. Qas hinte eenota oocheto, hinte agaazu nuuna loythi maadee. Hinte sunthay oosha woraqatan xaafetena, qas hinte zaaruwa xuuray kare kesena.

Ha ooshaw zaaruwa iman hinte qohetikita, qas hinte zaaranaw koyena oosha olli aadhanaw dandayiita. Oosha kunthanaw tamane icheshuwape laatamuwa daqiiqa gakanaw wursee.

Eenota

Hinte akeeda kumentha maraja maaran barena oytha meeziya ne bare suutha sukaariya kaali xeeliya maarana gaketeeda ooshatuwa zaaride nuuna wodiya aathitento galateeto. Ha pilgi xeela beetanaw hintew eenota de ee?

1. Eeno goope kaali de eya ooshako aadhite

2. Atto goope hara asaako aadhite

Markatethan ereteeda simiimiya

Oosha zaaruwa shiishiyawantu malla_____ Sunthaa______________ Paramaa______ Galasa________

Ereteedawe: kaali xeeliya---------- Paramaa_________

Oosha malla payduwaa ____

De eyaa saa: Katamaa woy shaako katamaa _______ Woradaa ________Akametiya kardiya payduwa------

ANNEX I: Glycemic control and self-care practice Dawrogna version questionnaire

Ooshatuwa ne zaaratuwa

Q.M	Shaakuwa I: Asatuwane heerana gaketeda ooshatuwa	Zaaruwa shaakuwa (hinte zaaruwa kababite)	Malla(z aaruwa)
1	Mattuma	Attumawa Machawa	1 2
2	Yeleta laytha		-------
3	Geluwa yewu new ayee?	Geledawa Gelibenawa Geli bilawaa Hayquwan shaketawa Haray de oope odite ----------------------	1 2 3 4
4	Haqan de eetee? -	Kataman Gaxaryan	1 2
5	Wursetha tamaaro dethay hintew ayee?	Xaafuwa ne nababuwa erenawa 1-8 tha kifiliya 9-12 tha kifiliya Kollejiyaa ne bolla	1 2 3 4
6	Ha e wodiyan hintew kiitay ayee?	Goshancha Kawo oosancha Zal ancha Golle gido aayato Oosu baynawa Haray de oope odite …………….	1 2 3 4 5
7	Amanu hintew ayee?	Misooniya Ortodoksiya Islaamaa Haray de oope odite --------------	1 2 3
8	Hintew qomu ayee?	Dawruwaa Oromuwa Amaara Haray de oope odite --------	0 1 2 3
9	Agenan aapu shaluwa demiite? (Tophiya Biran)		-------
10	Hinte golle pe Aspidaali gakanaw de eya haakotethay apune? (Klo metryan)		--------
	Shaakuwa II፡ Sukaarya hargiyaana gaketa ooshatuwa		
1.	Sukaariya hargiya gam uwaa		-------

2	Hinte gollen sukaariya harganchay de ee?	Ee baawa Erike	1 2 3
3 4 5	Bolla deexotetha (Kilo graamyan) Adusatetha (Santi meetiryan) Bolla kumentha		_________ ----------
6.	Mela uluwan lakayeteda suutha sukaariya(Wursetha heezu yuusan)	Yuusa itta Yuusa laa a Yuusa heeza	_________ ------------
7.	Ha e aya dhaliya akide eetee?	Dhaliya akike Mitetiyawa Insuliiniya narpiya Mitetiyawa ne insuliiniya narpiya	1 2 3 4
8.	Haakimiyan ereteeda suakaariya hargi aheeda metu hinte bollan de ee?	Ayne baawa Iti metuwaa Laa uwa ne bolla metuwaa	1 2 3
9.	Sukaariya hargiya qomuwa	Qomuwaa I Qomuwaa II Haray de oope odite -------	1 2 3
10.	Guja hargii de u saa	Baawa Itta Laau wa ne bolla	1 2 3
11.	Hae wodiyan hinte gollen suutha sukariya lakayiya miishay de ee?	Ee Baawa	1 2
12.	Sukaari beetode hinte laythay aapune		-----
13.	Yuusa qaxaruwa bonchiitee?	Ee Bonchike	1 2

Shaakuwa III: Sukaariya sakuwan barena oykusa wogaa na gaketa oosha

Hirkina de eyaa ooshatu sukaariya harganchatu aadheeda laapu galas an barena wooti oyqedinonto oochiyawanta. Gidopeatin aadheeda saamintant saketeedita gidoope guye laapu galasa biide hinte paxa gideeta wodiya go etanaw dandayiita.

	Muusa na gaketowan	Galasatuwa								Zaaru wa
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	
1	Aadheeda laapu galas an woysa wodiya maarana dee ya muusa kaaledite?									
2	Gishuwan adheeda laapu galas an aapu galasa ha muusa maara kaalitee?									

3	Aadheeda laapu galas an aapu galasa atikiltiyaa ne pirapriya guutha giina ichesuwa ne bolla meedite?										
4	Aadheeda laapu galas an aapu galassa modho quma meedite Leemiso zo o ashuwa woy modhu kumeeda mehiyaape beetiya qumaa?/ Xooma pe kase de eya wodiya go etite)										
5	Aadheeda laapu galas an aapu galasa wolqa imiya quma yigi go eteedite?										
	Bolla qaatha na gaketeeda oosha										
1	Aadheeda laapu galas an aapu qama hatamu daqiqas bolla qaatha udeedite (uba qaatha, hemethana gujiide)?										
2	Aadheeda laapu galas an aapu qama itti itti bolla qaathan beetedite? Heweka golli giduwani ne oosuwa san udiya qaatha gidenan										
	Bare suutha sukariya barew lakayiya ne kaaliya maara										
1	Aadheeda laapu galas an aapu qaniya hinte suutha sukaariya xeeleedite (Soype soype karenka)?										
2	Aadheeda laapu galas an aapu qaniya paxatetha hiilanchatu odo maaran hinte suutha sukaariya xeeleedite?										
	Gediya ne gediya bradhiya oytha na gaketowan										
1	Aadheeda laapu galas an aapu qama gediya ne gediya biradhatuwa garsa giduwa xeeleedite?										
2	Aadheeda laapu galas an aapu qama hinte caama garsa giduwa xeleedite?										
3	Aadheeda laapu galas an aapu gama hinte gediya meeceedite?										
4	Aadheeda laapu galas an aapu qama hinte gediya muukeedite?										
5	Aadheeda laapu galas an aapu qama hinte gediya meecetowape guyiyan biradhiya giduwa awsa curkan quceedite?										
	Dhaliyaa akuwa maara meezetusa na gaketowan										
1	Aadheeda laapu galas an aapu qama dhalatuwa paxatetha hiilanchatuwan odeto maaran suure akeedite?										
2	Aadheeda laapu galas an aapu qama narpiyan imetiya dhalatuwa odeto maaran suure (geesan, wodiyani ne saatiyan) akeedite?										
3	Aadheeda laapu galas an aapu qama mitetiya dhalatuwa odeto maaran suure (geesan, wodiyani ne saatiyan) akeedite?										
	Usha ne tambuwa na gaketowan										
1	Aadheeda laapu galas an tambuwa usheedite? Itti kaala gidoopeka?										
2	Aadheeda laapu galas an usha usheedite?										

Shaakuwa IV: Barena oytha maaran imetiya maquwa na gaketawan

1	Miye bakana utowantupe hinte maqetowantu haqawante? (Hinte maqetowa ubaa doorite)	1. Modhu darena qumaa muusaa 2. Kompleks karbohaydireetiyaa muusaa 3. Bolla deexotetha qanasanaw kaloriya guuthusa 4. Fayberiyaa loythi oyqiya quma uba wode muusaa 5. Atikiltiya darii oyqiya quma echeshu qama gakanaw muusa 6. Loqloquwa darena qumaa muusa 7. Haray de oope odite 8. Ayne maquwaa demabeyke	
2	Miye bakana utowantupe hinte maqetowantu haqawante? (Hinte maqetowa ubaa doorite)	1. Uba wode guutha bolla qaatha udussa 2. Polo guutha giina itti gewan heezu tara laatamu daqiiqas bolla qaatha udussa 3. Qaman qaman osetiya osuwan bola qaatha gujusa 4. Geesan, malani ne wodiyan zawateeda bolla qaathan barena beetisusa 5. Haray de oope odite 6. Ayne maquwaa demabeyke	
3	Miye bakana utowantupe hinte maqetowantu haqawante? (Hinte maqetowa ubaa doorite)	1. Qalamiya woraqatan suutha xokisiide sukaariya xeelusa 2. Gulukometiriya miishan suutha sukaariya xeelusa 3. Sheeshape sukaariya xeelusa 4. Haray de oope odite 5. Ayne maquwaa demabeyke	
4	Ha e wodiyan hintew immetu dhali haqawee?	1. Insuliiniya narpiya galas an itti woy laa u tara 2. Insuliiniya narpiya galas an heezu tara ne bolla 3. Mitetiyaa dhaliyaa 4. Insuliiniya narpiyaa ne mitetitiya dhaliyaa	
5	Adheeda yuusan tambuwa usha na gaketo oosha hintena oosheeda paxatetha hiilanchay de ee?	Baaawa De ee	
6	Tambuwa ushiita gidoope, aadheeda yuusan tambuwa usha esanada oy tambuwa usha esisiya uraa na gatheeda paxatetha hiilanchay de ee?	Baawa De ee Tambuwa ushike	
7	Tambuwa ushiita gidoope, Wursetha wodiyas tambuwa ayde usheeditee?	1. Laa u laythape kasena woy usha erike 2. Ituwape biide la u laythape kase 3. Oyduwape biide tamane laa u agaenape kase 4. Ituwape biide heezu agenape kase 5. Aadheeda agena garsan 6. Hachche	

Hawa misatiya zaaruwa ne hinte al o wodiya immo gishaw darii galatay!