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Prevalence and associated factors of poor glycemic control among type 2 diabetes patients in Bahir Dar city public referral hospitals, Ethiopia

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PREVALENCE AND ASSOCIATED FACTORS OF POOR GLYCEMIC
CONTROL AMONG TYPE 2 DIABETES PATIENTS IN BAHIR
DAR CITY PUBLIC REFERRAL HOSPITALS, ETHIOPIA

BY: TADELE KASSA (MD)

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COLLEGE OF MEDICINE AND HEALTH SCIENCES
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Title	PREVALENCE AND ASSOCIATED FACTORS OF POOR GLYCEMIC CONTROL AMONG TYPE 2 DIABETES PATIENTS IN BAHIR DAR CITY PUBLIC REFERRAL HOSPITALS, BAHIR DAR, North west ETHIOPIA
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Study Period	October1, 2025 to December 30,2025
Project Area	Bahir Dar City Public Referral Hospitals, Bahir Dar, Ethiopia

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Abstract

Background: Inadequate glycemic control is still significant obstacle in diabetes mellitus management and associated with increases risk of both acute and chronic complications. Even with improving in diabetes care, many people in low- and middle-income countries do not achieve the targeted glycemic goals. Knowing the prevalence and factors associated to poor glycemic control is crucial for improving diabetes management and decrease associated morbidity and mortality.

Objective: To determine the prevalence of poor glycemic control among type two diabetic mellitus and its associated factors who visit at public referral Hospitals in Bahir Bar city, Bahir Dar, Ethiopia, , 2026.

Methods: A Cross sectional study was conducted among type two diabetic patients who have followed up at public referral Hospitals in Bahir Bar city. The total sample size was 402. Systematic random sampling technique was used to select the study participant. Data was collected by interviewing patients and review chart. Data was collected by kobo tool box and exported in to excel and SPSS version 27 software. Both Bi-variable and Multi-variable regression analysis was used to identify factors associated with glycemic control. The result was presented in text and tables.

Result: The prevalence of poor glycemic control among type 2 diabetic patients was found to be 68.5% [63.76%, 72.94%]. Age ≥ 65 years (AOR=2.77 95%CI: 1.19, 6.45)), presence of comorbidities (AOR=2.18, 95%CI: 1.29, 3.61)), duration of illness >10 years (AOR=1.97, 95%CI: (1.07, 3.64)), drug poor adherence (AOR=2.48, 95%CI: (1.47-4.18)) and alcohol intake (AOR=2.32, 95%CI: (1.32, 4.08)) were factors associated with poor glycemic control.

Conclusion: The prevalence of poor glycemic control among study participants was high. Factors significantly associated with poor glycemic control included older age, longer duration of illness, poor medication adherence, presence of comorbidities and alcohol intake

Recommendations: counseling regarding to drug adherence and avoiding alcohol intake and more frequent regular follow up for high risk type two diabetic patients are recommended to reduce prevalence of poor glycemic control.

Keywords: Prevalence, Poor glycemic control, Factors, T2DM, Bahir Dare University, Bahir Bar city, Ethiopia

Lists of Acronyms and Abbreviations

ADA – American Diabetes Association

BMI - Body Mass Index

CI - Confidence Interval

DM - Diabetes Mellitus

FPG – Fasting Plasma Glucose

HbA1c - Hemoglobin A1C

IDF – International Diabetes Federation

FHRH- Felege Hiwot Referral Hospital

LMICs - Low- and Middle-Income Countries

MRCI–Medication Regimen Complexity Index

PGC - Poor Glycemic Control

RBS – Random Blood Sugar

T2DM - Type 2 Diabetes Mellitus

TGSH – Tibebe Ghion Specialized Hospital

WHO – World Health Organization

Table of Contents

Acknowledgements	I
Abstracts.....	II
Lists of Acronyms and Abbreviations.....	III
List of tables	VI
List of figures	VII
Introduction	1
1.1 Background.....	1
1.2 Statement of the Problem.....	2
1.3 Significance of the Study.....	3
2. Literature Review	4
2.1 Poor Glycemic Control	4
2.2 Prevalence of Poor Glycemic Control among T2DM	4
2.3 Factors associated with Poor Glycemic Control among T2DM.....	5
2.3.1 Socio-Demographic Factors	5
2.3.2 Clinical related conditions.....	6
2.3.3 Behavioral and self-care related Factors	7
2.4 Conceptual framework.....	9
3. Objectives	10
3.1 General Objective	10
3.2 Specific Objectives	10
4. Methods and materials.....	11
4.1 Study Area and Period	11
4.2 Study Design.....	11
4.3 Source Population.....	11
4.4 Study population.....	11
4.5 Eligibility criteria.....	11
4.5.1 Inclusion Criteria.....	11
4.5.2 Exclusion Criteria.....	12
4.6 Variables	12
4.6.1 Dependent Variables	12
4.6.2 Independent Variables	12
4.7 Operational definition.....	12

4.8	Sample size determination and sampling procedures	13
4.8.1	Sample sizedetermination.....	13
4.8.2	Sampling Technique	14
4.9	Data Collection Procedures	14
4.10	Data Quality Assurance	15
4.11	Data Processing and Analysis.....	16
4.12	Ethical Consideration.....	16
4.13	Dissemination and utilization of findings.....	16
5.	Result.....	17
5.1	Socio demographic characteristics the study participant.....	17
5.2	Clinical conditions	18
5.3	Diabetic self-care and behavioral related factors.....	20
5.4	Prevalence of poor glycemic control among T2DM	21
5.5	Factors associated with Poor Glycemic Control among Type 2 Diabetic patients.....	21
6.	Discussion	24
7.	Strength and limitation of the study	27
7.1	Strengths	27
7.2	Limitations	27
8.	Conclusion.....	27
9.	Recommendations	28
10.	References	29
11.	Annex	33
11.1	Annex I: English version of the questionnaires	33
11.1.1	Information Sheet and consent form	33
11.1.2	Data collection tools (questionnaires)	34
11.2	ANNEX II: Amharic version of the questionnaires'	37
11.2.1	የመረጃጽጽናየስምምነትቅጽበአማረኛ	37
11.2.2	የመረጃመሰብሰቢያጥያቄዎች.....	38
12.	Declaration	Error! Bookmark not defined.

List of tables

Table 1: sample size determination study to determine the prevalence of poor glycemic control and associated factors among T2DM patients attended at public referral hospitals of Bahir Dar city, North West Ethiopia, 2026	14
Table 2: Socio-demographic characteristics of the type two diabetic patients in Bahir Dar city public referral hospitals, North West Ethiopia, 2026(n=394)	17
Table 3: clinical condition related factors of the study participants in Bahir Dar city public referral hospitals, North West Ethiopia, 2026(n=394).....	18
Table 4: Biochemical parameters of the study participants in Bahir Dar city public referral hospitals, North West Ethiopia, 2026(n=394)	19
Table 5: behavioral and self-care related of the study participant in Bahir Dar city public referral hospitals, North West Ethiopia 2026(n=394).....	20
Table 6: Bi-variable and multivariable logistic regression analysis of Associated Poor Glycemic Control among Type 2 Diabetes Patient in public referral hospitals of Bahir Dar city, Ethiopia, 2026.....	22

List of figures

Figure 1: conceptual framework on factors associated with poor glycemic control among type two diabetic patients taken from different literature (6, 9, 15, 16, 25, 28, 37-41)	9
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1 Introduction

1.1 Background

One of the main difficulties in managing diabetes mellitus is inadequate glycemic control. Elevated blood glucose levels above recommended target, such as glycated hemoglobin (HbA1c) >7% or consistently elevated fasting glucose is poor glycemic control(1).Diabetes mellitus (DM) is one of the biggest health threats of recent times for the global nation(2).

Diabetes mellitus affects around 537 million adults aged 20 to 79 globally, accounting for one in every ten. This figure is expected to elevate to 643 million by 2030, and 783 million by 2045.

Diabetes mellitus affects more than three-quarters of people in low and middle-income countries, accounting for 6.7 million deaths in 2021, or one every five second(3).

Due to fast sociocultural changes, aging populations, urbanization, decreased physical activity, and unhealthy lifestyle and behavioral changes, type two diabetes mellitus accounts for 85% to 95% of all diabetes mellitus in westerns. This percentage is higher in low- and middle-income countries(3).

Diabetes mellitus affects 24 million people in Africa (1 in every 22 adults), with the number expected to increase to 55 million by 2045. It causes in the death of 416 thousand Africans by 2021(1).

Currently diabetes mellitus is increasing in Ethiopia as a result of nutritional changes, sedentary lifestyles, and urbanization. Approximately 1.9 million adults between the ages of 20 and 79 had diabetes, and another 2.9 million had poor glucose tolerance, which increases the chance of developing the disease(4).

Type two diabetes mellitus is a big global problem. It is defined by relative insulin insufficiency and insulin resistance, which results persistent hyperglycemia. To prevent complications like neuropathy, nephropathy, retinopathy, and cardiovascular disease, effective glycemic control is needed. However, in low- and middle-income countries like Ethiopia, where healthcare resources are limited, and achieving target glycemic control is very difficult(1, 5).

Overall, achieving glycemic control in diabetic patients is vital to monitor blood glucose levels effectively and minimize the chances of complications and mortality associated to diabetes(6). Inadequate control of blood glucose level markedly elevates the likelihood of immediate metabolic issues such as diabetic ketoacidosis and pronounced hypoglycemia, along with chronic micro and macro-vascular illness including nephropathy, retinopathy, neuropathy, ischemic heart

disease, and peripheral vascular disease. These effects significantly influence diabetes mellitus-related illness, death rates, and health-care expenses worldwide(7).

Multiple factors have led to poor glycemic management, such as age, duration of the illness, treatment regimen, patients' perception of health, education status, occupation, and adherence to medication(8).

1.2 Statement of the Problem

Diabetes mellitus results high public health problem within the healthcare system, as over 5% of the world population not yet diagnosed with diabetes mellitus(9). Type two diabetes mellitus is an increasing global public health issue, mainly in low and middle-income country(10).

Type two diabetes mellitus affects around 9.3% of world population (11, 12), and more than four million people die each year, with half of them die before reaching age of 70(13). Around 422 million people globally suffer for type two diabetes mellitus most of them live in low- and middle-income country. Type two diabetes mellitus is directly responsible for 1.5 million deaths annually(13). Based on international diabetes federation(IDF) report, type two diabetes mellitus will affect around 62 million populations by the end of 2045, and it makes seventh most common cause of death in 2030(3).

Many type two diabetic patients do not fulfill targets glucose level despite advancements in medical management, which accelerate the risk of micro-vascular and macro-vascular complications, persistent hyperglycemia, and increase healthcare expenses (7). According to studies, 34.4% of people had DM-related consequences. The most prevalent DM-related complications were retinopathy (26.7%), foot ulcers (17.1%), nephropathy (14.3%), and neuropathy (10.5%)(14).

A significant percentage of type two diabetic patients in Ethiopia have inadequate glycemic control, according to individual studies and systematic reviews. According to a recent systematic review and meta-analysis, 61.1% of Ethiopian type two diabetic patients had inadequate glycemic control (15). Some studies were conducted in the study area previously. But most of them were focused on total diabetic patients. Due to this, there is this knowledge gap undermines efforts to design targeted interventions and inform T2DM management strategies at the local level. As a result the aim of this study was to assess the prevalence and factors associated with poor glycemic control among type two diabetic patients attended in public referral hospitals of Bahir Dar city Ethiopia, 2026.

1.3 Significance of the Study

This study finding is important to provide context-specific evidence on poor glycemic control, which can assist FMOH and ARHB to expand access to patient education programs focusing on behavioral change, Strengthen community-based interventions targeting alcohol reduction and medication adherence in identified high-risk patient groups and modifiable risk factors.

This study finding is crucial for health professionals to improve clinical decision-making, enhancing patient counseling, promoting adherence to treatment and lifestyle modification.

Furthermore, this study finding source of information future longitudinal studies and evaluations of interventions at improving glycemic control and reducing diabetes-related morbidity and mortality specifically for type two diabetes patients.

2 Literature Review

2.1 Poor Glycemic Control

Elevated glycated hemoglobin (HbA1c) above the target ranges (often $\geq 7\%$) are the most common predictor of poor glycemic control, which is the major challenge in the management of diabetes mellitus(16).It is a strong indicator of diabetes's acute and chronic complications, such as retinopathy, nephropathy, neuropathy, and cardiovascular disease(9). Despite advancements in treatment, a large number of diabetic patients worldwide fail to achieve their glycemic goals, adding to the pressures on populations and the healthcare system.

2.2 Prevalence of Poor Glycemic Control among T2DM

According to the study conducted in Korea revealed that, the prevalence of poor glycemic control among type two diabetic patients was 48.1%(17). According to the study done in Malaysia showed that, the prevalence of poor glycemic control among type two diabetic patients was 66.4%(18). The study done in Iran showed that, the prevalence of poor glycemic control among type two diabetic patients was 56.8% (19). The study done in Saudi Arabia showed that, the prevalence of poor glycemic control among type two diabetic patients was 74.9%(20). According to a systematic review and meta-analysis done in low and middle income countries revealed the pooled prevalence of poor glycemic control among type two diabetic patient was 69%(21)

According to the study done in Cameroon showed that, the prevalence of poor glycemic control among type two diabetic patients was 71%(22). The study in Uganda showed that the prevalence of poor glycemic control among type two diabetic patients was 84.3% (23). According to the study done at Ghana showed the prevalence of poor glycemic control among type two diabetic patients was 59.3%(24). The study done in Tanzania revealed that, the prevalence of poor glycemic control among type two diabetic patients was 66.1% (25). The study done in Zambia showed that the prevalence of poor glycemic control among type two diabetic patients was 61.5% (26).

According to the systematic review and meta-analysis conducted in Ethiopia reported that approximately 61.9% of diabetic patients had poor glycemic control (9). According to the studies in low- to middle-income settings consistently demonstrate elevated rates of poor glycemic control, often exceeding 50% of patients assessed (9).

Study in Southern Ethiopia found that 82.4% of type two diabetic patients had poor glycemic control (6). While, another study done in Dire Dawa showed that the overall prevalence of poor glycemic control among type two diabetic patients was 45.2% (27). The study done in Jimma showed that the prevalence of poor glycemic control among type two diabetic patients was 58.1% (28). The study done in Hawasa comprehensive specialized hospital showed, the prevalence of poor blood glucose control among type two diabetic patients was 70% (29). According to the study conducted in Ayder comprehensive specialized hospital, the prevalence of poor glycemic control among type two diabetic patients was 61.9%(30). According to the study in Debre Tabor general hospital the prevalence of poor glycemic control among type two diabetic patients was 71.4%(31). According to the study done at Dessie the prevalence of poor glycemic control among type two diabetic patients was 73.5 % (32). The study done at Tikur Anbessa specialized hospital the prevalence of poor glycemic control among type two diabetic patients was 73.8% (5). The study done at Bahir Dar city referral hospital the prevalence of poor glycemic control among all diabetic patients was 66.2%(4)

2.3 Factors associated with Poor Glycemic Control among T2DM

2.3.1 Socio-Demographic Factors

The study in India showed that, educational status was significant factor for glycemic control among type two diabetic patients (33). The study done in Iraq showed that educational status was significantly associated with poor glycemic control among type 2 diabetic patients (34).

The study in Uganda showed that age >60 was significant factor for poor glycemic control among type two diabetic patients (23). According to the study done at Ghana showed that older age was significant factor for poor glycemic control among type two diabetic patients (24). The study in Burkina Faso revealed that, low level of formal education was significantly associated with poor glycemic control among type two diabetic patients (35)

A systematic review and meta-analysis study conducted in Ethiopia demonstrated that not attending a formal education and being over the age of 50 were important risk factors for poor glycemic control among those having type two diabetes(36). According to the study done at Tikur Anbessa specialized hospital older age was significant factor for poor glycemic control among type two diabetic patients(5). The study done in Dire Dawa showed being female was significant predictors of poor glycemic control among type two diabetic patients(37). The study

done in Debre Tabor hospital showed that educational status was significant factor for glycemic control among type two diabetic patients (31). The study done at Dessie compressive referral hospital showed that, lack of formal education was significant Factor associated with poor glycemic control among type two diabetic patients (32). The study done at Bahir Dar city public referral hospitals showed that lower educational status was significant factor associated with poor glycemic control among all diabetic patients(4).

2.3.2 Clinical related conditions

The study in India showed that, BMI was significant factor for glycemic control among type two diabetic patients (33). According to the study conducted in Korea revealed that, duration of diabetes mellitus for > 7 years and cholesterol ≥ 200 mg/dl were significantly associated with poor glycemic control among type two diabetic patients (17). Longer diabetic durations (5–10 years and >10 years) and being overweight were found to be strongly related with poor glycemic control in type two diabetic patients, according to a Saudi Arabian study(20). The study done in Iraq showed that dyslipidemia, cholesterol level ≥ 200 mg/dl, high TG and LDL level were significantly associated with poor glycemic control among type two diabetic patients (34).

According to the study done in Cameroon showed that, duration diabetes mellitus between 5 and 10 years was significantly associated with poor glycemic control among type two diabetic patients(22). According to the study done in Ghana showed that, duration of diabetes mellitus (> 10 years), insulin therapy, and comorbidities were factors significantly associated with poor glycemic control among type two diabetic patients(24). The study in Burkina Faso revealed that, obesity was the factors independently associated with poor glycemic control among type two diabetic patients (35).

According to the study done at Tikur-Anbessa specialized hospital,diabetes mellitus duration of > 10 years and insulin therapy were factors associated with poor glycemic control among type two diabetic patients (5).According to the study done in Dire Dawa, overweight, obese and duration of illness ≥ 10 years were significant predictors of poor glycemic control among type two diabetic patients(37). According to systematic review and meta-analysis study in Ethiopia showed that, longer duration of illness and having comorbidity were significant factors for poor glycemic control among type two diabetic patients(36). According to the study conducted in southern Ethiopia, having diabetic complications, duration of diabetes mellitus ≥ 7 years, insulin

and oral hypoglycemic agents, and dyslipidemia were significantly associated with poor glycemic control (6). The study done in Debre Tabor hospital, duration of diabetes mellitus was associated factors for glycemic control(31). The study done at Dessie compressive referral hospital showed that, obesity ,overweight ,high total cholesterol and diabetes mellitus duration of ≥ 10 years were significant Factors associated with poor glycemic control among type two diabetic patients(32). The study conducted at Bahir Dar city public referral hospital showed that longer duration of diabetes and high body mass index were factors significantly associated with poor glycemic control among diabetic patients(4).

2.3.3 Behavioral and self-care related Factors

According to the study conducted in Korea revealed that, alcohol drinking and lack of regular physical activity were significantly associated with poor glycemic control among type two diabetic patients(17). The study conducted in Saudi Arabia showed that, in-adequate physical exercise was significantly associated with poor glycemic control among type two diabetic patients(20). The study done in Iraq showed that, self-glycemic monitoring, diet, physical activity and adherence for diabetic medication were significant factors associated with glycemic control(34)

According to the study done in Cameroon showed that, non-adherence to treatment and diet were significant factor for poor glycemic control among type two diabetic patients (22). The study done in Tanzania revealed that, in-adhere for regular follow-up and alcohol intake were significant risk factor for poor glycemic control among type two diabetic patients(25). The study in Burkina Faso revealed that, poor adherence to anti-diabetic treatment was significantly associated with poor glycemic control among type two diabetic patients(35)

According to systematic review and meta-analysis study in Ethiopia showed that, low adherence to diabetes management was significant factor associated with poor glycemic control among type two diabetes(T2DM) patients(36). According to the study done at Tikur Anbessa specialized hospital, poor diet compliance and failure to set goals for glycemic control were factors associated with poor glycemic control among type two diabetic patients(5).According to the study done in Dire Dawa, smoking, self-glycemic monitoring ≤ 3 x/week, and poor adherence to diabetic medication were significant predictors of poor glycemic control among type two

diabetic patients (37). According to the study conducted in southern Ethiopia, lack of self-glucose monitoring and lack of physical exercise were significantly associated with poor glycemic control among type two diabetic patients(6).The study done in Debre Tabor hospital showed that, dietary adherence were associated factors for glycemic control among type two diabetic patients (31).Thestudy done at Bahir Dar city public referral hospital showed that, longer durations of diabetes and poor adherence toanti-diabetic drugs were factors significantly associated with poor glycemic control among all diabetic patients(4).

2.4 Conceptual framework

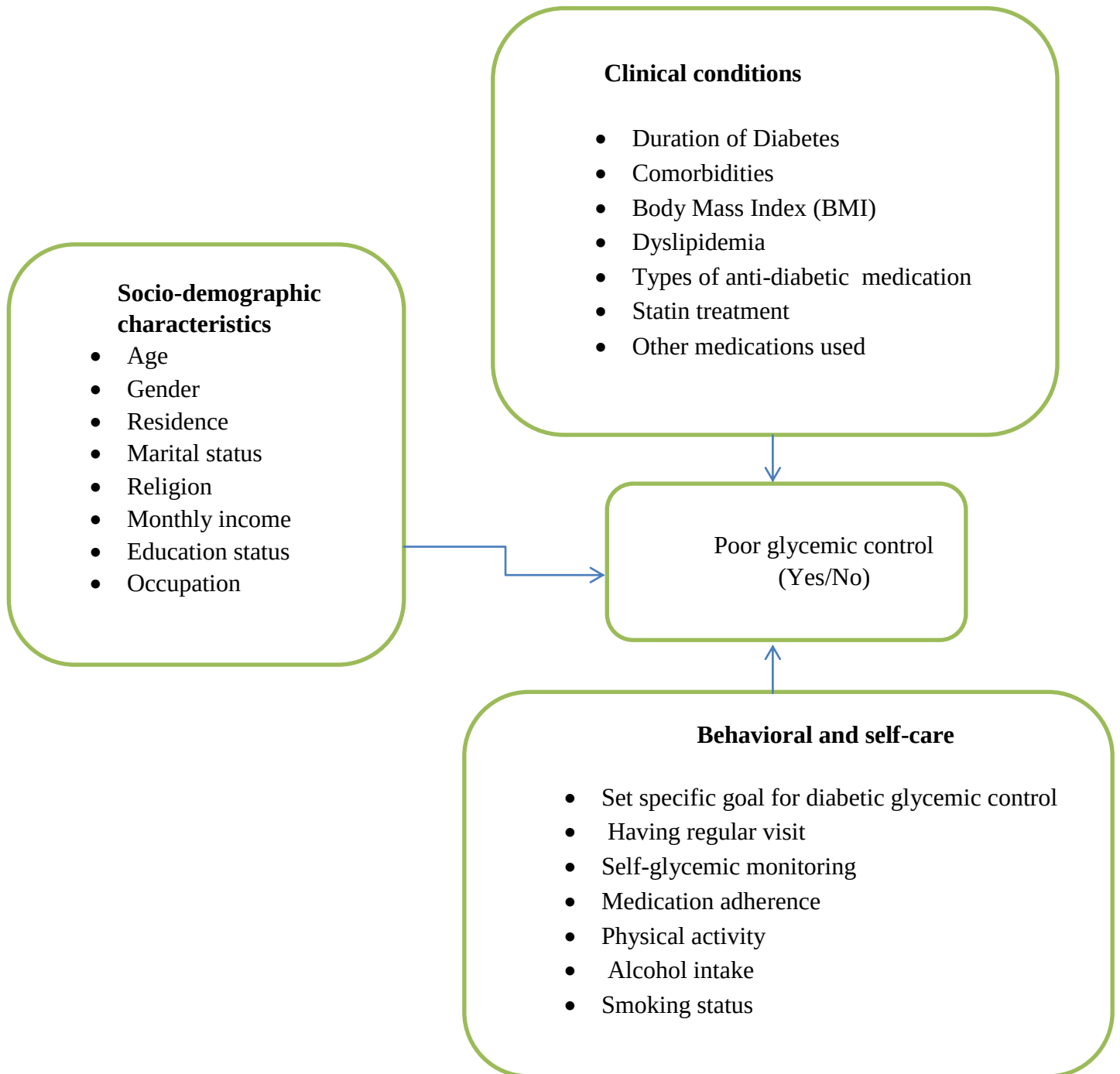


Figure 1: conceptual framework on factors associated with poor glycemic control among type two diabetic patients taken from different literature (6, 9, 15, 16, 25, 28, 37-41)

3 Objectives

3.1 General Objective

The aim of this study is to assess the prevalence and factors associated with poor glycemic control among type two diabetic patients attended in public referral hospitals of Bahir Dar city, Ethiopia, 2026.

3.2 Specific Objectives

To determine the prevalence of poor glycemic control among type two diabetic patients attended in public referral hospitals of Bahir Dar city, Ethiopia, 2026.

To identify factors associated with poor glycemic control among type two diabetic patients attended in public referral hospitals of Bahir Dar city, Ethiopia, 2026.

4 Methods and materials

4.1 Study Area and Period

This study was undertaken in TGSH and FHCSH, Bahir Dar, North-West Ethiopia. It is located 565 km from Addis Ababa, the capital city of Ethiopia. TGSH is a tertiary health care level and teaching hospital serving the population of Bahir Dar town and remote areas of northwest Ethiopia. The hospital provides a broad range of medical services to both inpatients and outpatients of all ages as linked. They also serve as a teaching hospital to several medical, nursing, midwifery, pharmacy, anesthesia, and medical laboratory and medicine students in both undergraduate and postgraduate programs. TGSH is the second-largest hospital in the nation, and it has around 500 inpatient beds in the four major departments (obstetrics and gynecology, medicine, pediatric, and orthopedic) and other specialty units (ear, nose and throat, dermatology, and ophthalmology). TGSH has over 100 specialists and sub-specialists in various areas of medical specialization. According to the chief executive officer's office report, the total population served by the hospital is around 5 million. FHCSH is referral hospital of North West Amhara. This study was conducted from October 1 – December 31, 2025.

4.2 Study Design

A cross sectional study design was used among type two diabetic patients attended in public referral hospitals of Bahir Dar city from October 1 – December 31, 2025.

Population

4.3 Source Population

All adult patients who were diagnosed with type two diabetes mellitus and had follow up at public referral hospitals of Bahir Dar city.

4.4 Study population

All adults with type two diabetes mellitus who have follow up at public referral hospitals of Bahir Dar city during the study period.

4.5 Eligibility criteria

4.5.1 Inclusion Criteria

Patients aged ≥ 18 years that had been on anti-diabetic treatment for at least six months were included in the study to ensure adequate duration for assessment of glycemic control.

4.5.2 Exclusion Criteria

Patients who were critically ill, pregnant women, having acute infection, CKD, anemia and those with incomplete medical records were excluded from the study. Participants with the above clinical condition were excluded, since HgA1C is significantly affected by the above clinical conditions. This increases the prevalence of the outcome variables.

4.6 Variables

4.6.1 Dependent Variables

Poor glycemic control (Yes/No)

4.6.2 Independent Variables

Socio-demographic Factors: Age, gender, residence, marital status, religion, monthly income, education status and occupation

Clinical related conditions: Duration of diabetes, comorbidities, body mass index (BMI), dyslipidemia, types of anti-diabetic medication, statin treatment and other medications used.

Behavioral and self-care related characteristics: set specific goal for glycemic control, having regular visit, self-glycemic monitoring, medication adherence, dietary adherence, physical activity, smoking status and alcohol intake

4.7 Term and Operational definitions

Type 2 DM: Patients diagnosed with type 2 diabetes mellitus by physician and document based on ADA diagnostic criteria ($FBS \geq 126\text{mg/dl}$ or $RBS \geq 200\text{mg/dl}$ with classic hyper glycaemia symptoms or $HbA1C \geq 6.5\%$)(1)

Good Glycemic Control: Glycemic control was deemed good if a patient's HbA1c value was $< 7\%$ (1)

Poor Glycemic Control: Glycemic control was considered poor if a patient's HbA1c value was $\geq 7\%$ (1)

Adherence to Medication: Adherence to medication was defined as the study participant taking all prescribed anti-diabetic medications over the past seven days (32)

Adherence to Exercise: Adherence to exercise was defined as the study participant engaging in moderate intensity physical exercise for more than three days per week, with each session lasting (32)

Adequate self-glycemic monitoring: adequate self-glycemic monitoring was defined as the study participant has glycemic monitoring > 3 times per week (32)

Alcohol intake:if patient reported consuming alcoholic beverage at least once per week for the past 30 days(42)

Dietary adherence: patients consider adherent to the dietary if they reported following recommended diabetic guideline consistently(1)

Comorbidity: The presence of other chronic diseases in addition to diabetic mellitus.

4.8 Sample size determination and sampling procedures

4.8.1 Samplesizedetermination

Sample size was determined by using a single population proportion formula. Byusing the first objective that is the prevalence poor glycemic control fromstudies done in Dessie comprehensive specialized Hospital was73.5 %(32), 95 % CI, 5% margin of error, and 10% design effect was used.

$$n = \frac{(Z_{\alpha/2})^2 p (1-p)}{d^2}$$
$$n = \frac{(1.96)^2 \cdot 0.735(1-0.735)}{(0.05)^2}$$
$$n=300$$

Where: n is the maximum sample size

$Z_{\alpha/2}$ is 1.96 (95% confidence level for two sides)

P=0.735 is the proportion of population

d is the margin of error which is 5

The sample size = 300

Sample size for second objective was determined by using double population formula using Epi-Info 7 soft were by using 95%CI,power 80%, exposed to unexposed ratio of 1, and the corresponding AOR of each significantly associated predictor variables

Table 1: sample size determination study to determine the prevalence of poor glycemic control and associated factors among T2DM patients attended at public referral hospitals of Bahir Dar city, North West Ethiopia, 2026

Variables	CI	Pow er	AOR	Exposed to unexposed ratio	% of un exposed	% exposed	Final Sample Size	P value	Ref.
Duration of illness	95%	80%	3.32	1	31.2	42.5	106	0.000	(32)
Obesity	95%	80%	5.32	1	42.6	14.6	62	0.001	(32)
Alcohol intake	95%	80%	2.00	1	65.8	60.2	365	0.014	(38)
Cholesterol level	95%	80%	7.79	1	20.9	52.7	42	0.000	(32)

Accordingly, the second objective takes the maximum sample size. Therefore the sample size was 365. By adding 10% design effect the final sample size was 402.

4.8.2 Sampling Technique

TGSH and FHCSH were selected purposely because those Hospitals are the largest and referral Public Hospital in Bahir Bar city, and most type diabetic patients were referred to those hospitals and the follow up were at referral hospital levels. A systematic random sampling technique was used to select study participants from diabetic register. The study participants were selected every 2 interval, and the first participant was selected randomly by using lottery method.

4.9 Data Collection Procedures

Structured interviewer administered data collection tool was used to collect data from the patient and medical records. Data collection began after informed consent obtained from all participants. Socio-demographic, behavioral, and clinical data were collected through face-to-face interviews using a pre-tested structured questionnaire derived from various literature sources (6, 9, 15, 16, 25, 28, 37-41). The data collection tools those containing socio-demographics, patient clinical conditions, and behavioral and diabetic self-care related characteristics and, measurable variables were collected from patients.

Weight measurements were taken using a digital scale accurate to 0.1 kg, and height was measured with a vertical measuring rod accurate to 0.1 centimeters. Participants were instructed to remove shoes, hair clips, and braids before being measured. They stood in the correct position as per standard protocol: feet together, flat on the ground, heels against the back plate, legs straight, buttocks and scapula against the backboard, and arms loosely at their sides(43).

Laboratory investigations included assessing serum HbA1c levels using the Wondfo HbA1c Rapid Quantitative Test, which employs sandwich fluorescence immunoassay technology known for its high sensitivity and specificity in quantifying HbA1c percentages in human blood(44)additionally, fasting blood sugar (FBS), and lipid profiles were analyzed using the BS-240 Clinical Chemistry Analyzer. Tests were calibrated and performed in line with the manufacturer's instructions, and stringent quality control measures were implemented. Standard Operating Procedures (SOPs) for each test were rigorously followed to ensure accuracy, reliability, and consistency in results.

4.10 Data Quality Assurance

The data collection tool was prepared in English and translated in local language Amharic for better understanding. A logical sequence, simplicity, and clarity of the questionnaire were done. Data collectors and supervisor were trained for 1day on how to fill the questionnaire properly. Pretest was conducted on 5% of randomly selected T2DM patients at Adisalem primary hospital prior to data collection, and minor adjustments were made based on feedback. During the data collection process, the questionnaires' were checked for their completeness and consistency by the principal investigator and one supervisor every day to correct any if it has faults.

Strict quality control procedures were followed during laboratory analysis. Daily quality control tests were conducted for each analyzses before sample analysis, and controls were carried out with every new lot of reagents or after maintenance.

Fasting blood samples were collected into pre-labeled SST and EDTA tubes, with their quality and quantity verified. Samples were processed promptly and transported to respective hospital laboratory. The results were accurately coded and thoroughly documented to ensure traceability and reliability throughout the study the investigator was export the collected data from kobo tool box to SPSS 27 software. Data cleanup was performed by running frequencies of each variable to check for clarity, completeness, and consistencies of data.

4.11 Data Processing and Analysis

The data were coded entered and cleaned using kobo tool box software and exported to SPSS version 27 software. A chi-square test of association was done for categorical data analysis. Bivariate and multivariate logistic regression analysis was used to determine factors of poor glycemic control. Model fitness was checked by using Hosmer and Lemeshow and level of significance found to be 0.38. Odds ratio, 95% CI, and P-value were used to describe the findings' significance. Variables with a p-value of ≤ 0.25 in the bivariate logistic regression was entered into the multivariate logistic regression analysis to identify possible confounding variables. Variables with a p-value of ≤ 0.05 with a 95% confidence interval and adjusted odds ratio (AOR) in multivariate logistic regression were considered as statically significant factors for the poor glycemic control. Finally, the results were presented in text and tables.

4.12 Ethical Consideration

Ethical clearance was obtained from Bahir Dar University College of Medicine and Health Science. The ethical letters were given to TGSH and FHCSH to get permission for the data collection process. Permission letter was obtained from both hospitals. The necessary explanation regarding the purpose of the study was informed to data collectors and concerned official bodies in the hospital. Confidentiality of the information was assured by not recording patients' names from the chart and privacy of the information was maintained. Patients with poor glycemic controls were linked to respective diabetic follow up clinics.

4.13 Dissemination and utilization of findings

The result of the study will be presented to Bahir Dar University College of Medicine and Health Science, Department of internal medicine. The findings will be disseminated to TGSH and FHCSH, Amhara Regional Health Bureau, and the concerned body. Furthermore, the findings will be also presented at different workshops, seminars, and research symposiums organized at local, national, and international levels. Finally, the findings will be published in an internationally reputable journal for access to every concerned body

5 Result

5.1 Socio demographic characteristics the study participant

Among the total of 402 study participants were selected for the study 394 (98%) diabetic patients were included in the study. The minimum and maximum age group of the participants was 32 and 85 years respectively. The mean and standard deviation of respondent's age were 55.93($\pm$ 11.60) respectively. Two hundred thirty-three (59.1%) of respondents were male, and 294(74.6%) were urban residents.

Table 2: Socio-demographic characteristics of the type two diabetic patients in Bahir Dar city public referral hospitals, North West Ethiopia, 2026(n=394)

Variables	Categories	Frequency (N)	Percent (%)
Age	18-44 years	51	12.9
	45-54 years	105	26.6
	55-64 years	107	27.2
	$\geq$ 65 Years	131	33.2
sex	Male	233	59.1
	Female	161	40.9
Place of residence	Rural	100	25.4
	Urban	294	74.6
Religion	Orthodox	289	73.4
	Muslim	88	22.3
	Others(protestant, catholic)	17	4.3
Marital status	Single	29	7.4
	Married	310	78.7
	Divorced	37	9.4

	Widowed	18	4.6
educational status	No formal education	144	36.5
	Primary	54	13.7
	Secondary	88	22.3
	Higher education	108	27.4
Occupation	Governmental employee	55	14.0
	Non-governmental employee	46	11.7
	Merchant	54	13.7
	House wife	62	15.7
	Daily labor	47	11.9
	Farmer	130	33.0
Averagemonthly Family income in ETB	<5000	104	26.4
	5000-10000	192	48.7
	>10000	98	24.9

5.2 Clinical conditions

Among all participants the duration of illness <5 years were 173 (43.9%), and 214 (54.3%) of the participants had comorbidities. From those participants 263 (66.8%) used oral hypoglycemic agent, 349 (88.6%) used statin treatment, and 149 (37.8%) were used medications other than anti diabetics. Among those study participants 196 (49.7%) participant were having BMI <25.

Table 3: clinical conditions of T2DM patients in Bahir Dar city public referral hospitals, North West Ethiopia, 2026(n=394)

Variables	Categories	Frequency(N)	Percent (%)
Duration of illness	<5 years	173	43.9

	5-10 years	82	20.8
	>10years	139	35.3
	Insulin agent only	29	7.4
Treatment regimens	Oral hypoglycemic control	263	66.8
	Insulin +oral hypoglycemic control	102	25.9
Statin treatment	No	45	11.4
	Yes	349	88.6
Other Medications	No	245	62.2
	Yes	149	37.8
Comorbidities	No	180	45.7
	Yes	214	54.3
BMI	<25	196	49.7
	25-29.9	142	36.0
	>=30	56	14.2

5.3 Biochemical parameters

Two hundred thirty five (59.6%) of participants total cholesterol level were <200mg/dl. Two hundred seventy nine (70.8%) of the participants LDH level were less than 60 mg/dl and 364(92.4%) of LDL level were less than 130mg/dl. Among study participants 275(68.5%) were HgbA1C>=7% and 198(50.3%) were FBS >=126mg/dl.

Table 4: Biochemical parameters of T2DM patients in Bahir Dar city public referral hospitals, North West Ethiopia, 2026(n=394)

Variables	Categories	Frequency(N)	Percent (%)
Total cholesterol level	<200mg/dl	235	59.6
	>=200mg/dl	159	40.4
HDL	<60	279	70.8

	>=60	115	29.2
LDL	<130 mg/dl	364	92.4
	>=130mg/dl	30	7.6
HgbA1C	<7%	119	31.5
	>=7%	275	68.5
FBS	<126mg/dl	196	49.7
	>=126mg/dl	198	50.3

HbA1c Glycated Hemoglobin, HDL High Density Lipoprotein, LDL Low Density Lipoprotein, FBS Fasting Blood Sugar

5.4 Diabetic self-care and behavioral related factors

From all participants the 247(62.7%) were set specific goal, and 228(57.9%) of the participants were used self-glycemic monitoring. From those participants 359(91.1%) having regular follow up at health facility, and 254(64.5%) was not adherent to its prescribed medication. Two hundred fifty one (63.7%) participants reported non adherent to diet, 216 (54.8%) participants were having in-adequate physical activity. Among those study participants 127(32.2%) were taking alcohol, and only 30(7.6%) participants were smoking cigarette.

Table 5: behavioral and self-care related of the study participant in Bahir Dar city public referral hospitals, North West Ethiopia, 2026(n=394)

Variables	Categories	Frequency(N)	Percent (%)
Set specific goal for glycemic control	No	247	62.7
	Yes	147	37.3
Self-glycemic monitoring	Inadequate	228	57.9
	Adequate	166	42.1
Having regular follow up at health facility	No	35	8.9
	Yes	359	91.1
Drug adherence	Yes	140	35.5
	No	254	64.5

Reasons for drug in adherence	Lack of access to facility	37	9.4
	Difficulties	54	13.7
	Lack of time	44	11.2
	Culture	41	10.4
	Lack of support	78	19.8
Dietary condition	Non adherent	251	63.7
	Adherent	143	36.3
Physical activity	Inadequate	216	54.8
	Adequate	178	45.2
Alcohol drinking	No	267	67.8
	Yes	127	32.2
	No	364	92.4
Smoking	Yes	30	7.6

5.5 Prevalence of poor glycemic control among T2DM

The prevalence of poor glycemic control among type 2 diabetic patients was found to be 68.5% [63.76%, 72.94%].

5.6 Factors associated with Poor Glycemic Control among Type 2 Diabetic patients

The odds of having poor glycemic control among patients with aged ≥ 65 years was 2.77 times higher compared to patient's age 18-44 years (AOR=2.77 95%CI: (1.19-6.45)). The odds of poor glycemic control among patient with having comorbidities were two times higher compared to patients without comorbidities (AOR=2.18, 95%CI: (1.29-3.68)). The odd of poor glycemic control among patients with >10 years duration of illness were two times higher compared to <5 years of duration of illness (AOR=1.97, 95%CI: (1.07-3.64)). The odd of poor glycemic control among patients with self-discontinued of medication were 2.48 times higher compared to without

self-discontinuation of diabetic medication (AOR=2.48, 95%CI: (1.47-4.18)). The odd of poor glycemic control among patients with alcohol drinking were 2.32 times higher compared its counter parts (AOR=2.32, 95%CI: (1.32-4.08))

Table 6: Bi-variable and multivariable logistic regression analysis of Associated Poor Glycemic Control among Type 2 Diabetes Patient in public referral hospitals of Bahir Dar city, Ethiopia, 2026

Variables	Categories	Poor Glycemic control		COR(95%CI)	AOR (95%CI)
		No N (%)	Yes N (%)		
Age	18-44 years	22(5.6)	29(7.4)	1	1
	45-54 years	40(10.2)	65(16.5)	1.23(0.63-2.43)	1.40(0.63-3.11)
	55-64 years	36(9.1)	71(18.0)	1.50(0.76-2.97)	1.55(0.67-3.58)
	>=65 years	26(6.6)	105(26.6)	3.06(1.52-6.18)	2.77(1.19-6.45)
Education status	No formal education	33(8.4)	111(28.2)	2.50(1.45-4.30)	0.87(0.46-1.649)
	Primary	16(4.1)	38(9.6)	1.76(0.88-3.54)	1.84(0.80-4.24)
	Secondary	29(7.4)	59(15.0)	1.51(0.84-2.71)	1.63(0.82-3.23)
	Higher education	46(11.7)	62(15.7)	1	1
Average monthly family income in ETB	<5000	22(5.6)	82(20.8)	2.68(1.44-4.98)	1.74(0.79-3.96)
	5000-10000	61(15.5)	131(33.2)	1.56(0.93-2.55)	0.87(0.46-1.65)
	>10000	41(10.4)	57(14.5)	1	1
Duration of illness	<5 years	70(17.8)	103(26.1)	1	1
	5-10 years	22(5.6)	60(15.2)	1.85(1.04-3.29)	1.83(0.94-3.54)

	>10 years	32(8.1)	107(27.2)	2.27(1.38-3.74)	1.97(1.07-3.64)
Comorbidities	No	71(18.0)	109(27.7)	1	1
	Yes	53(13.5)	161(40.9)	1.99(1.29-3.05)	2.18(1.29-3.68)
BMI	<25	72(18.3)	124(31.5)	1	1
	25-29.9	41(10.4)	101(25.6)	1.43(0.90-2.28)	1.15(0.62-2.15)
	>30	11(2.8)	45(11.4)	2.36(1.16-4.88)	2.10(0.92-4.81)
Total cholesterol level	<200	79(20.1)	156(39.6)	1	1
	>=200	45(11.4)	114(28.9)	1.28(0.83-1.99)	1.10(0.60-2.01)
Drug adherence	Yes	65(16.5)	75(19.0)	1	1
	No	59(15.0)	195(49.5)	2.86(1.84-4.46)	2.48(1.47-4.18)
self-glycemic monitoring	Inadequate	55(14.0)	173(43.9)	2.24(1.45-3.45)	1.34(0.79-2.27)
	Adequate	69(17.5)	97(24.6)	1	1
Dietary conditions	Non adherence	68(17.3)	183(46.4)	1.73(1.12-2.68)	1.06(0.63-1.80)
	Adherence	56(14.2)	87(22.1)	1	1
Physical activity	In adequate	63(16.0)	153(38.8)	2.24(1.45-3.45)	1.34(0.78-2.27)
	Adequate	61(15.5)	117(29.7)	1	1
Alcohol intake	No	97(24.6)	170(43.1)	1	1
	Yes	27(6.9)	100(25.4)	2.11(1.29-3.46)	2.32(1.32-4.08)

6 Discussion

In the present study, the prevalence of poor glycemic control among type 2 diabetic patients was found to be 68.5% [63.76%, 72.94%] indicating that more than two-thirds of the study participants failed to achieve recommended glycemic targets. This finding demonstrates that poor glycemic control remains a major challenge in the management of type 2 diabetes mellitus and represents a substantial risk for the development of diabetes-related complications.

This study finding is comparable with findings from several studies conducted in Ethiopia, which documented high levels of poor glycemic control among type 2 diabetic patients. This finding is in line with the study conducted in Tanzania 66.1% (25), systematic review and meta-analysis done in low and middle income countries 69%(21), Hawasa comprehensive specialized hospital 70% (29), Adam Hospital Medical College reported that 64.1% (45), and in Debre Tabor general hospital 71.4%(31). These studies showed that, achieving optimal glycemic control was the major challenge across various populations in sub-Saharan Africa, likely due to shared barriers such as limited access to healthcare resources, inadequate patient education, and suboptimal adherence to treatment regimens.

This study finding is higher than the study done in Korea 48.1%(17), in Iran 56.8% (19), in Southwest Ethiopia 59.2%(46) and systematic review and meta-analysis conducted in Ethiopia (61.1%) of type 2 diabetic patients had poor glycemic control. The slightly higher prevalence observed in the current study may be attributed to differences in study settings, patient characteristics, access to diabetes care services, and variations in treatment adherence and lifestyle practices.

This study finding is lower than the study conducted in Uganda 84.3% (23), in Southern Ethiopia 82.4% (6), in Dessie 73.5 % (32) and, Tikur Anbessa specialized hospital 73.8% (5). This study discrepancy may be due to, differences in patient populations and referral patterns, variation in outcome measurement methods and variation in patient clinical and behavioral characteristics.

In this study, we found that age ≥ 65 years was significantly associated with poor glycemic control. This finding of this study was consistent with previous studies in Uganda (23), in Ghana (24), systematic review and meta-analysis in Ethiopia(15), in Addis Ababa (5) and, in West Shewa Zone (38). The possible reason for this consistency is age-related declines in β -cell function and progressive insulin resistances are well-recognized physiological processes that impair glucose regulation and complicate diabetes management over time. Additionally, older adults are more likely to have accumulated a longer duration of diabetes, multiple comorbid conditions, and reduced physical activity all of which exacerbate challenges in maintaining target glycemic levels. Social determinants may further worsen glycemic outcomes in elderly patients. Older adults often face barriers such as diminished self-care ability (e.g., physical limitations, lower health literacy), reduced adherence to medication and lifestyle recommendations, and greater dependency on caregivers for disease management. These patterns have been reported in diverse Ethiopian settings where low educational status and poor diabetes knowledge were associated with inadequate glycemic control, especially in older age groups (47).

In this study, presence of comorbidities was found to be a significant factor associated with poor glycemic control among patients with T2DM. This finding is consistent with studies conducted in systematic review and meta-analysis in Ethiopia(36), in southern Ethiopia (6), and in Dessie (32). This consistency may be comorbidities increase the complexity of diabetic management and negatively affect treatment outcomes.

The present study finding showed that having duration of diabetes mellitus greater than 10 years was significantly associated with poor glycemic control among T2DM. This study finding is consistent with studies conducted in Ghana (24), systematic review and meta-analysis in Ethiopia(41), in Dire Dawa (37), in Dessie(32), and in Debre Tabor hospital(31). The consistency may be due to, the duration of diabetes increases; progressive β -cell dysfunction and insulin resistance reduce the body's ability to maintain normal glycaemia, even with treatment.

In our study finding, self-discontinuation of anti-diabetic medication as a significant factor associated with poor glycemic control among T2DM. This finding is consistent with studies conducted in Iraq (34), in Cameroon (22), in Burkina Faso (35), systematic review and meta-analysis study in Ethiopia (36) and, in Dire Dawa(37). The consistency may be due to,

discontinuation of prescribed therapy leads to ineffective treatment. In Ethiopia, self-discontinuation of medication may be associated with financial constraints, limited access to medicines, fear of side effects, perceived improvement in symptoms, and inadequate patient education in low-income country.

In this study alcohol drinking was a significant factor associated with poor glycemic control among patients with T2DM. This finding is consistent with studies conducted in Iraq(17), in Tanzania(25) and, in Dessie(32). This consistency may be due to, alcohol interferes glucose metabolism by impairing hepatic gluconeogenesis and insulin sensitivity, which leads to both hyperglycemia and hypoglycemia, particularly among patients using insulin or oral hypoglycemic agents(48).

7 Strength and limitation of the study

7.1 Strengths

This study has several strengths.

First, the study was conducted in multiple public referral hospitals, which increases the representativeness of the study populations. Including participants from more than one center improves the external validity and generalizability of the finding.

Second, the study focused on modifiable risk factors associated with poor glycemic control such as medication adherence, physical activity, dietary practice and life style-related behaviors provides practical and actionable evidences

Third, the study findings are highly relevant to local context. Therefore, the finding can serve as baseline information for health care providers, hospital administrators and policymakers to develop appropriate strategies and improve diabetic managements..

7.2 Limitations

Despite of its strength, this study has some limitations that should be consider while interpreting the finding.

First, the study employed across sectional study design.as a result; it can't establish causal relationship between comorbidities and poor glycemic control. The findings demonstrate only associations.

Second, some variable were based on participants self-report information, such as dietary practice, physical activity, and medications adherence. Therefore, the study may be subjected for recalling biases.

Third, the study may affected by social desirability. Participant may over reported socially acceptable behavior such as good adherent for the medications or education statusand under reported undesirable behaviors like, Smoking history, alcohol intake, chewing khat and monthly income.

Despite these limitations, structured questionnaires', trained data collector and assurance of confidentiality was implemented to minimize the impact of these biases

8 Conclusion

The prevalence of poor glycemic control among study participants was high. Factors significantly associated with poor glycemic control included older age, longer duration of illness, poor medication adherence, presence of comorbidities and alcohol intake.

9 Recommendations

For Healthcare Providers

- ✓ Give special attention to older patients and those with long duration of diabetes through closer monitoring and individualized treatment plans.
- ✓ Strengthen screening and management of comorbid conditions to reduce their impact on glycemic control.
- ✓ Routinely assess medication adherence and provide counseling to improve compliance.
- ✓ Give advice to patients to reduce alcohol intake and counseling into routine diabetes care.

For Health Facilities

- ✓ Establish structured follow-up systems for high-risk groups, including elderly patients and those with multiple comorbidities.
- ✓ Integrated behavioral counseling services, such as adherence support and alcohol reduction counseling, into diabetes clinics.

For Policymakers

- ✓ Expand access to patient education programs focusing on long-term diabetes management and behavioral change.
- ✓ Strengthen community-based interventions targeting alcohol reduction and medication adherence.

For Future Research:

- ✓ Further longitudinal studies to better understand causal relationships between these factors and glycemic control.

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11 Annex

11.1 Annex I: English version of the questionnaires

11.1.1 Information Sheet and consent form

Information sheet

Title of the research: The aim of this study is to assess the prevalence and factors associated with poor glycemic control among T2DM patients attended in public referral hospitals of Bahir Dar city Ethiopia, 2026.

Name of Principal Investigator Dr. Tadele Kassa (Resident)

Phone number: +251923393994

Email: drtade.kd@gmail.com

Name of the Organization: Bahir Dar University College of medicine and health science department of internal medicine

Sponsor for the project: Bahir Dar University.

Purpose of the Research Project: To assess the prevalence and factors associated with poor glycemic control among T2DM patients attended in public referral hospitals of Bahir Dar city Ethiopia, 2026.

Benefits: No direct benefit for one is included in this research.

Risk: There is no risk because no need to take any type of medication for the research purpose

Confidentiality: The names of patients were not written in the format. All information's were kept strictly confidential and were used only for the study purpose

Consent form

My name is _____. I am a health professional at Tibebe Ghion Specialized Hospital. I am assigned as a data collector. The principal investigator wants to conduct a study to assess the prevalence and factors associated with poor glycemic control among T2DM patients attended in public referral hospitals of Bahir Dar city Ethiopia, 2026. If you voluntarily participate in the study we will continue the interview, and if you are not voluntarily close the interview.

Are you voluntary? 1. Yes 2. No

11.1.2 Data collection tools (questionnaires)

Instruction: Please read the question as well as circle for the given number choice or tick the box to those closed-ended questions and write the answer for the open-ended questions.

Date...../...../.....

Name of Data collector...../signature.....

Name of supervisor...../signature.....

MRN

Part I: Socio-demographic Characteristics of the study participant		
No.	Questions	Coding category
101	Age	----- in years
102	Residence	a) Urban b) Rural
103	Religion	a) Orthodox b) Muslim c) Others
104	Marital status	a) Single b) Married c) Widowed d) Divorced
105	Educational status	a) Unable to read and write b) Primary education c) Secondary education d) College and above
106	Occupation	a) Farmer b) Government employer c) Private employer d) Merchant e) Daily labor f) House wife

		g) Other.....
107	Average family monthly income	In ETB birr
108	Weight	-----kg
108	Height	-----in cm
110	BMI	 In kg/m ²

Part II: clinical condition related factors of the study participant

201	Durations of diabetes	in years
202	Current diabetic medication	a) Oral hypoglycemic agent b) insulin c) oral hypoglycemic agent and insulin
203	Other medication	a) Yes b) No
204	Statin treatment	a) Yes b) No
205	Comorbidities	a) Yes b) No
206	Total cholesterol	mg/dl
207	HDL	mg/dl
208	LDL	mg/dl
209	HgbA1C	%
210	RBS	mg/dl
211	FBS	mg/dl

Part IV: Behavioral and self-care related characteristics of the study participant

301	Set specific goal	a) Yes b) No
-----	-------------------	-----------------

302	Self-glycemic monitoring	a) Adequate b) In adequate
303	Having regular follow up at health facility	a) Yes b) No
304	Drug adherence	a) Yes b) No
305	Reason for drug in adherence	
306	Dietary condition	a) adherent b) non adherent
307	Physical exercise	a) Adequate b) Inadequate
308	Alcohol intake	a) Yes b) No
309	Smoking cigarette	a) Yes b) No

11.2 ANNEX II: Amharic version of the questionnaires'

11.2.1 የመረጃ ገጽ እና የስምምነት ቅጽ በአማርኛ

የመረጃ ገጽ

የጥናቱ ርዕስ:- በባህር ዳር ከተማ፣የህዝብ ሪፈራል ሆስፒታሎች ውስጥ በሚታከሙ የሁለተኛው አይነት ስኳር ታካሚዎች ላይ ያለውን ዝቅተኛ የደም ስኳር ቁጥጥር ስርጭት እና ከዝቅተኛ የደም ስኳር ቁጥጥር ጋር የተያያዙ ምክንያቶችን ለመገምገም፣ በኢትዮጵያ፣ 2026

የጥናቱ ባለቤት ስም፡ዶ/ርታደለካሳ (የውስጥደዌ ረዚደንት)

ስልክቁጥር፡ +251923393994

ኢሜይል፡ drtade.kd@gmail.com

የድርጅቱ ስም፡የባህር ዳር ዩኒቨርሲቲ የህክምናና የጤና ሳይንስ ኮልጅ የውስጥ ደዌ ሕክምና ክፍል
የፕሮጀክቱ ስፖንሰር፡ባህር ዳር ዩኒቨርሲቲ.

የጥናቱዓላማ፡- በባህር ዳር ከተማ፣የህዝብ ሪፈራልሆስፒታሎች ውስጥ በሚታከሙ የሁለተኛው አይነት ስኳር ታካሚዎች ላይ ያለውን ዝቅተኛ የደም ስኳር ቁጥጥር ስርጭት እና ከዝቅተኛ የደም ስኳር ቁጥጥር ጋር የተያያዙ ምክንያቶችን ለመገምገም፣በኢትዮጵያ፣ 2026

ጥቅሞች፡በዚህጥናት ውስጥ በመካተቱ በተናጠል ምንም አይነት ቀጥተኛ ጥቅም የለውም
አደጋ፡- ምንም አይነት አደጋ የለም ፤ምክንያቱ ምለምርምር አላማ ምንም አይነት መድሃኒት መውሰድ አያስፈልግም .፤ነገር ግን የሁለተኛው አይነት የስኳር ታካሚዎች ላይ ያለውን የደም ስኳር ቁጥጥር ሁኔታ ብቻ ይመለከታል.

ምስጢራዊነት፡ የታካሚዎች ስም አይጻፍም.፤እንዲሁም ሁሉም መረጃዎች ጥብቅ ሚስጥራ እና ለጥናቱ ዓላማ ብቻ ጥቅም ላይ ይውላሉ .

የስምምነት ቅጽ

ስሜ _____ ነው. እኔ በጥበብ ግዮን ስፔሻላይዝድ ሆስፒታል ውስጥ የጤና ባለሙያ እና መረጃ ሰብሳቢ ነኝ፡፡ጥናቱ የሚያጠነጥ ነው በባህር ዳር ከተማ፣የህዝብ ሪፈራል ሆስፒታሎች ውስጥ በሚታከሙ የሁለተኛው አይነት ስኳር ታካሚዎች ላይ ያለውን ዝቅተኛ የደም ስኳር ቁጥጥር ስርጭት እና ከዝቅተኛ የደም ስኳር ቁጥጥር ጋር የተያያዙ ምክንያቶችን ለመገምገም ነው፡፡

11.2.2 የመረጃ መሰብሰቢያ ጥያቄዎች

መመሪያ፡ እባክዎን የማረጋገጫ ዝርዝሩን ያንብቡና የምርጫ ቁጥሮች የሚፈልጉትን ክብብ፣ በሰላም

የተቀመጡ ጥያቄዎችን ለሰላም ምልክት ያድርጉ እና ክፍት የሆኑትን ጥያቄዎች መልሱን ይፃፉ፡

ቀን/...../.....

የመረጃ ሰብሳቢው ስም/ፊርማ -----

የሱፐርቪዘር ስም /ፊርማ -----

የካረቱ-----

ክፍል አንድ፡ የጥናት ተሳታፊዉ/ዋ ማህበራዊ እና ኢኮኖሚያዊ መረጃን በተመለከተ		
ተ.ቁ	መጠየቅ	ኮድ
101	አድሜኒዎን-----	-----
102	የመኖሪያ ቦታ	1. ከተማ 2. ገጠር
103	እምነት	1. አርቶዶክስ 2. ሙስሊም 3. ሌላ
104	የጋብቻ ሁኔታ	1. ያላገባ/ች 2. ያገባ/ች 3. ባልየሞተባት/ሚስቱ የሞተችበት 4. አግብታ የፈታች/የፈታ
105	የትምህርት ሁኔታ	1. ማንበብና መፃፍ የማትችል/የማይችል 2. የመጀመሪያ ደረጃ 3. ሁለተኛ ደረጃ 4. ኮሌጅ /ዩኒቨርሲቲ

106	የስራሁኔታ	1. ገበሬ 2. የቤትእመቤት 3. የመንግስትሰራተኛ 4. የግልተቀጣሪ 5. ነጋዴ 6. ጉልበትሰራተኛ 7. ሌላ
107	ወርሀዊየቤተሰብገቢ	ቡብር
108	ክብደት	-----በኪ.ግ
109	ቁመት	-----በሳ.ሜ
110	የክብደትናቁመትጠቅሚ	ኪ.ግ/ሜ ²
ክፍልሁለት፡የጥናትተሳታፊዎች/ዋክሊኒካዊሁኔታዎችእናተዛማጅምክንያቶችንበተመለከተ		
201	ስኳርአለብዎከተባሉምንያህልጊዜ ሆነዉ?	በዓመት
202	አሁንሚወስዱተየስኳርመድሃኒት ምንድንነዉ?	1. አንሱሊን 2. የሚዋጥየስኳርመድሃኒት 3. የሚዋጥየስኳርመድሃኒትእናኢንሱሊን
203	ሌላሚወስዱትመድሃኒትአለ?	ሀ) አዎ ለ) አይ
204	የስብመቀነሻመድሃኒትይወስዳሉ?	ሀ) አዎ ለ) አይ
205	ተጓዳኝበሽታአለብዎት?	ሀ) አዎ ለ) አይ
206	ጠቅላላየኮሌስትሮልመጠን	ሚ.ግ/ዴ.ሊ.
207	ኤልዲኤል	ሚ.ግ/ዴ.ሊ.
208	ኤችዲኤል	ሚ.ግ/ዴ.ሊ.
209	ሄሞግሎቢንኤዋንሲ	%

210	የደምስኳርመጠንከስምንትሰአትያ ምበኋላ	ሚ.ግ/ደ.ሊ.
211	የደምስኳርመጠንከምግብበኋላ	ሚ.ግ/ደ.ሊ.
ክፍል III : የጥናትተሳታፊዉ/ዋባህሪእናራስንመንከባከብበተመለከተ		
ተ.ቁ	መጠይቅ	ኮድ
301	ለስኳርቁጥጥርግብአስቀምጣዋል?	ሀ) አዎ ለ) አይ
302	የደምዎንየስኳርመጠንበሳምንትምንያህ ልጊዜይለካሉ?	-----
303	ጤናተቋምወስጥመደበኛክትትልያደርጋሉ	ሀ) አዎ ለ) አይ
304	የጤናባለሙያሳያማክሩየስኳርመድሃኒት ዎንአቋረጠዉያውቃሉ?	ሀ) አዎ ለ) አይ
305	መድኃኒትዎንላለመዉሰድዎምክንያደሉ ዎት?	ሀ) መርሳት ለ) የመድኃኒትየጎንዮሽጉዳቶች ሐ) መድኃኒቶችንለመግዛትገንዘብማጣት መ) መድኃኒቱንለመዉሰድአለመቻል ሠ) ስለጠቀሜታውግንዛቤማጣት ረ) ሌላ: _____
306	አመጋገብዎንእንዴትይገልፁታል?	ሀ)ጤናማእናሚዛናዊ ለ) ከፍተኛስኳርእናካርቦሃይድሬት ሐ) ወጥነትየሌለው
307	አዘውትረውበቂየአካልብቃትእንቅስቃሴ ያደርጋሉ?	ሀ) አዎ ለ) አይ
308	አልኮልይጠጣሉ ?	ሀ) አዎ

		ለ) አይ
309	ሰጋራያጨሳሉ?	ሀ) አዎ ለ) አይ

12 Declaration

I, the undersigned, declared that this is my original work, has never been presented in this university, and that all the resources and materials used for the research, have been fully acknowledged.

Principal Investigator

Name: **Dr. Tadele Kassa (Year III medical resident)**

Signature: _____

Date: 25.07.2018 E.C

Advisors

1. Name: **Dr WudassieMelak. (Internist and Gastroenterologist)**

Signature: _____

Date: _____

2. Name: **Mr. Getasew Tesfa. (MSc PhD fellow)**

Signature: _____

Date: 24-07-2018 E.C

