ADDIS ABABA UNIVERSITY COLLEGE HEALTH SCIENCE
SCHOOL OF NURSING AND MIDWIFERY

Glycemic Control Level and Its Associated Factors among Adult Cancer Patients with Comorbid Type II Diabetes in Public Cancer Care Centers in Addis Ababa, Ethiopia, 2023.

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THIS THESIS RUSALT TO BE SUBMITTED TO ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCE SCHOOL OF NURSING AND MIDWIFERY AS PARTIAL FULFILLMENT FOR THE REQUIREMENT FOR MASTERS OF SCIENCE DEGREE IN CLINICAL ONCOLOGY NURSING.

January 2023,

Addis Ababa, Ethiopia

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Abbreviations and Acronyms

ADT -Androgen Deprivation Therapy

BMI- Body mass index

CI- Confidence interval

DKA- Diabetic ketoacidosis

DM- diabetes mellitus

ECOG-Eastern Cooperative Oncology Group

ESCC- Esophageal Squamous Cell Carcinoma

FBS- Fasting blood sugar

HbA1c- HemoglobinA1c

HrQOL- health related quality of life

IDF- international diabetic federation

NMIBC -Non-Muscle Invasive Bladder Cancer

NSCLC- non small cell lung cancer

OGTT- Oral Glucose Tolerance Test

OS – overall survival

PC – prostatic cancer

T2DM- Type **2** diabetes mellitus

UKPDS - United Kingdom prospective studies of Diabetes

WHO - World Health Organization

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ABSTRACT

Background: The two main causes of fatalities worldwide are cancer and DM they are more common and dramatically increasing. Currently, those with cancer co-morbid with DM have higher rates of morbidity and early death than cancer patients without DM. However the most and essential means to control complications of Diabetes Mellitus is controlling serum glucose level, to the best of our knowledge there is no study conducted in Ethiopia to identify aspects of the problem.

Objectives: The purpose of the study is to determine the glycemic control level and its associated factors among adult cancer patients with comorbid type II diabetes in public cancer care centers in Addis Ababa, 2023.

Methods: **Methods**: In Tikur Anbesa Hospital and St. Paul's Hospital Millennium Medical College (SPHMMC), a cross-sectional study design was used. Each study area, participants were selected by convenient sampling technique. Data was filled kobo toolbox and exported to SPSS program version 26.0 for analysis. The degree of association between dependent and independent variables were assessed using binary logistic regression analysis. The odds ratio (OR) with a 95% confidence interval (CI) and a P-value of 0.05 was used to evaluate statistical significance. Finally, result of the study presented in the form of text, tables and figures.

Result - This study included 120 participants in total. The majority 75(62.0 %) of them were female patients. Most 30(25%) study participants were diagnosed and treated for Hematologic cancer, followed by gynaecological cancer 26(21.7%). Regarding fasting blood glucose level, more than half 68 (56.7%) of the study participants were hyperglycaemic (FBG >130mg/dl) and only 38(31.7%) study participants checked their HgA1C values in the last 6 months. Treatments of DM, Forget to include fruits in the dietary plan and Educational status (illiterate) was related to good glycemic control practice. Patients who were illiterate were 3.1 times more likely to have a good glycemic control practice than patients who were educational status was below diploma (AOR = 3.68, 95% CI: 1.24-10.94, P=0.02) and patients who forgot to include fruits in their dietary plan were 64% less likely to be good glycemic control practice (AOR= 0.36, 95% CI: 0.12-1.06, p=0.03).

Conclusion- The glycemic control level in adult cancer patients was poor even if most of the study participants got dietary education for the management of diabetic mellitus. Education level and forgetting to include fruits in their diet were factors linked to good glycemic control levels.

Keywords: glycemic control; Associated factors; Type-2 Diabetes Mellitus, Addis Ababa University, SPHMMC,AddisAbaba,Ethiopia.

1. INTRODUCTION

1.1. Background

Patients with cancer who develop diabetes mellitus have a worse prolonged duration of Relative to those without diabetes, persons with diabetes have a lower overall life expectancy and are more likely to get sick, get hospitalized, or both. (1) Chemotherapy customers with diabetes and cancer have a higher chance of getting glycemic control problem (2) (3). An estimated 20% of cancer patients have diabetes mellitus as their underlying condition, making them more susceptible to acquiring new onset diabetes mellitus and its consequences (4) (5).

A metabolic disorder related to diabetes mellitus (DM) that has chronic hyperglycemia as a result of defects in insulin secretion, insulin action, or both may have a number of etiologies (5). One of the most prevalent non-communicable illnesses, DM has a considerable impact on the health of a significant portion of the global population (6)**.**

American cancer society stated that cancer is the second leading cause of death worldwide and 10 million deaths in 2020 were attributed to cancer. Low-and-middle-income countries shoulder most of the cancer burden. In 2020, out of nearly 10 million cancer-related deaths worldwide, 70% were in low-and-middle-income countries (7).

Diabetics have a greater probability of developing a number of solid and hematologic malignancies, such as non-Hodgkin's lymphoma and cancers of the liver, pancreas, colon, kidney, bladder, endometrium, and breast (8). Numerous lately conducted investigations and meta-analyses have found that cancer patients had a six-fold higher prevalence of diabetes than the general population (1) (9) (10)**.** Glycemic control practice can positively or negatively affect the overall survival of the patient with cancer (12). The study findings from Taiwan also show that individuals with diabetes mellitus (DM) who had a mean HbA1c level below 9% were more likely to die from any cause or from a non-PC cause than non-DM participants. (11).

Cancer is becoming the primary concern in sub-Saharan Africa since the prevalence is expected to rise by more than 92% between 2020 and 2040 (7). According to a 2015 research, In Ethiopia, it's anticipated that 21,563 males will have cancer and 42,722 occurrence cancer cases diagnosed in women (11).

Diabetes increases the risk of cancer, particularly malignancies of the pancreas, breast, colon, lung, and prostate (12) (13). The association between glycemic control and outcomes in cancer patients with diabetes throughout the survival period has only been briefly studied. These few studies' findings consistently show that diabetes raises the chance of cancer recurrence, death, and symptom severity in cancer patients (14) (8). A healthy balance between nutritional consumption, exercise, and medication administration is necessary to keep blood glucose levels at levels that prevent complications related to diabetes. To achieve this balance, individuals with diabetes must actively and effectively collaborate with their healthcare providers and adjust their medication and other treatment options in accordance with their daily blood glucose profiles (15).

1.2. Statement of the Problem

Cancer and diabetes are two of the leading causes of death in the world today and their incidence continues to increase where individuals with diabetes are at higher risk for developing cancer, specifically cancers of the breast, colon, lung, prostate, and pancreases (16). In 2019, it was estimated that 463 million individuals are suffering from diabetes, and it is the number of patients is anticipated to increase to 578 million by 2030 and 700 million by 2045 (17). Cancer type and the use of any glucose-lowering drug appear to have different effects on the relationship between glycemic control and cancer risk (18).Patients with cancer who are also diabetic are more likely to experience lower glycemic control throughout chemotherapy (1). Patients with cancer are more likely to get newly diagnosed diabetes mellitus and hyperglycemia, and 20% of those who have cancer are thought to have diabetes mellitus as a preexisting condition despite Uncertainty exists regarding the connection between chemotherapy and glycemic management. (19). Infections, hospital stays, and the intensity of suffering can all be worsened by poor management of glycemic levels and may shorten their lives
(16) (20).

It is essential to maintain good glycemic control when treating cancer patients with DM because concurrent chemotherapy or corticosteroid use affects serum glucose levels and escalates the risks of infection, hospitalization, and even premature death as a result (20).

Cancer patients' prognoses were worsened by the presence of the diabetic complications metabolic disorder, hemodynamic problems or unconsciousness. (20Although it is well known

that controlling hyperglycemia benefits diabetes patients, the level of glycemic control that patients maintain is insufficient, and there are many different factors that can contribute to poor glycemic control, including those that are related to the patient and the healthcare provider (21)**.** Compared to cancer patients without diabetes, people with co-morbid diabetes and cancer had higher morbidity and early death rates. (21).

Diabetes patients with cancer who have poor glycemic control run the risk of having a poorer standard of life due to a higher risk of death and recurrence as well as worsening symptoms. In addition to in general health-related quality of life (HrQOL), cancer patients who have diabetes additionally indicated lower physical activity and vitality than cancer patients without diabetes (12).

However, we have no research evidence concerning the practice of glycemic control and associated factors among cancer patients with comorbid type 2diabetes in Ethiopia. The intent of this research is to determine the glycemic control level and identify associated factors with glycemic control level among cancer patients with comorbid diabetes attending in Addis Ababa cancer care centers.

1.3. Significance of the Study

This study is important area of research that has significant implication for researchers, healthcare institutions, policy makers, and patients

For researchers studying this research can help to expand our understanding glycemic control practice in cancer patients with type 2 DM. It can also help identify areas for further research and guide the development of new intervention and treatments.

For health care institutions, guide them for development of clinical guide lines and protocols for the management of these patients.

For policy maker, the study this research can inform the development of policies and initiatives to improve the care and outcomes of these patients. It can also help to identify areas for investment and allocate resources to address the needs of these patients. The finding of this research will provide information on the magnitude and associated risk factors in poor glycemic control of diabetic with cancer patients. It will have an input for health care providers for improving care given for DM with cancer patients. Since studies are lacking in the area, it will also have public health contribution by providing information for further study in this topic.

2. LITERATURE REVIEW

2.1. Introduction

The main killers in the world are cancer and diabetes mellitus (DM), and both diseases are becoming progressively more prevalent. Compared to cancer patients without DM, people with greater morbidity for cancer with coexistence as well as untimely death rates (22). Cardiovascular disease-related mortality made to be the leading cause of death for those with T2DM; however, the main cause of T2DM-related death has shifted, with malignancies now outpacing vascular illnesses, according to data from an epidemiological analysis of linked primary care records in England (21).

Cancer is one of the most common diseases worldwide with approximately 18.1 million cases and 9.6 million cancer deaths in 2018 (5). The same study shows that Lung and breast cancer accounted for over 2.1 million instances each, or 11.6% of all cancer cases in 2018, followed by colorectal cancer (1.8 million cases), prostate cancer (1.3 million cases), stomach cancer (1.0 million cases), and colorectal cancer (1.8 million cases). Even though there are numerous studies conducted on the glycemic control there is scarcity of data on cancer patients with comorbid DM.

2.2.Effects of glycemic control among cancer patients

Diabetes patients are more likely to develop cancer, according to epidemiological data, and both hyperglycemia and hypoglycemia can worsen prognosis and cause complications for diabetic patients receiving cancer treatment (23).

In USA, Increased preoperative HbA1c was linked to not completing neoadjuvant treatment and surgery as well as a tendency to have a greater chance of metastatic spread, according to a study (24).

Study carried out on esophageal squamous cell carcinoma (ESCC) prognosis from Japan identified 30(4.8%) of poor glycemic control among 64 (10.3%) patients with comorbid DM. When compared to patients who had normal glycemic control, those with inadequate glucose control had worse overall and disease-specific survival rates. A study showed that inadequate glucose control has higher likelihood of all (HR 1.72 (95% CI 1.02–2.88) and disease-specific (1.65 (95% CI 0.89–3.08)

Mortality (25).

A recent systematic review (17) found that prevalence of poor glycemic control ranged between 45.2% and 93% while another systematic review and meta-analysis study found HbA1c increase with the start of androgen deprivation therapy (ADT) (26). There is also another systemic review that clarified that Blood sugar, FBG, and HbA1c levels have no impact on a patient's chance of surviving pancreatic cancer (27). Study conducted in Korea revealed that Patients with non-muscle invasive bladder cancer had a shorter progression-free survival rate when their baseline and post-operative glycemic control were poor (28).

Interval walking less blood sugar OGTT area and considerably better postprandial glycemic control, according to a clinical experimental study carried out in Denmark on 39 sedentary (150 minutes of weekly moderately rigorous exercise) patients with stage I to III colorectal cancer (29). Retrospective study from Taiwan reported that poor glycemic control is associated with poor prognosis in patients with both DM and newly diagnosed non-muscle invasive bladder cancer (NMIBC). Another study from the same country also described that poor glycemic control (HbA1c ≥7.0%) increases the risk of subsequent bladder cancer recurrence (30) and study obtained from China expressed Patients with advanced non-small cell lung cancer NSCLC have lower survival rates when their glycemic levels are disturbed, whereas their overall survival (OS) increases when their HbA1c is less than 6.6% (31). Cancer patient with diabetes comorbidity gradually develop other life threatening complications like obesity. Case-control study done in USA pointed out that there was no glycemic change among squamous cell carcinoma for both with and without type T2DMIn addition, HbA1c reduced with time in DM patients ($p = 0.04$), and their 5-year overall survival rate fell to 61%, compared with 78% in patients without DM ($p = 0.004$). And finally, The mean blood sugar measurements of patients with DM (153.4 mg/dl) and patients without DM (109.8 mg/dl) throughout the year following SCC were substantially different, whereas patients with DM had a greater body mass index (BMI) (mean [SD], 29.7 [6.94] vs 28.0 [4.17] kg/m2; $p = 0.041$) (32).

Similarly, according a study among patients with comorbid DM, mean HbA1c Within the initial year following a cancer diagnosis showed slight difference among patients with ovarian cancer and uterine cancer (6.8% vs 7.2%). Patients with diabetes mellitus (DM) experienced mean glucose levels that were higher than those without (130.3 vs. 113.8 mg/dl). There was a time effect for ovarian cancer as well; the 3-year overall survival (OS) for the DM group was 60% compared to 55% for the non-DM group (median follow-up, 25 months); patients with DM had

higher glucose levels for uterine cancer 1 year after diagnosis than patients without DM (147 vs 106 mg/dl); and there was also a time effect for uterine cancer. (33).

Opposing to above findings, another ten year prospective cohort study conducted found Colorectal cancer survivors had a non-significant 1% lower probability of reaching the target and a non-significant 0.3 /mol higher mean HbA1c compared to patients without a history of cancer, but there was no clinically significant difference in the probability of reaching the target HbA1c between these groups of patients (34).

A five year case-control study from USA identified 5-year overall survival rates were 56% (95% CI: 42-68%) for DM patients and 57% (95% CI: 43-69%) for non-DM patients ($p = 0.62$), and the researchers came to the conclusion that neither DM nor colorectal cancer had an influence on glycemic control (35). However a study from the same country on metastasis breast cancer (36) expressed diabetes and hyperglycemia were associated with worse overall survival (OS) among a cohort of longer-term survivors.

According to a South Korean study comparing colon cancer patients with and without diabetes, those with uncontrolled diabetes had significantly lower median and overall survival rates than those with well-controlled diabetes who had a high relative risk of mortality (RR=4.58). According to the researchers of the present research (37), patients with diabetic colon cancer need to have a HbA1c of 7.8% or below in order to have the best glycemic control.

2.3. Factors affecting of glycemic control among cancer patients with comorbid T2DM

Even though the mechanism for direct relationship between cancer and DM is unknown (38), Cancer treatments like chemotherapy and corticosteroids can have an impact on a patient's blood sugar level. Patients' propensity to prioritize their cancer care at the expense of their diabetes management can exacerbate this effect, When these phenomena are considered collectively, the likelihood that Diabetes will worsen the prognosis for cancer patients (16).

In USA, there was study which found in older patients receiving intense AML treatment while hospitalized higher mean blood glucose levels and greater glycemic variability were linked to worse remission probabilities and shorter overall survival (39). A study from China found that good glycemic control was positively correlated with almost all appropriate self-management behaviors (40). Another study from the same the USA identified long-term poor glycemic control was substantially linked with having diabetes for a longer period of time, being under 35, and using 15 or more drugs (41).

Among DM alone focused exceptional studies, systemic review which was conducted on DM patients alone listed out education level, gender, body mass index, and obesity are all modifiable variables that impact glycemic control, with the exception of gender and length of T2DM, fasting glucose level, and hypertension, which are considered clinical factors (17). A study conducted in India revealed efficient health promotion upgrades knowledge, attitudes, and behaviors, especially in relation to dietary management and lifestyle changes, which improves glycemic control and can slow the progression of diabetes and prevent complications down the path (42). Another study from India found a strong relationship between poor glycemic control in T2DM and gender (female), age, high-density lipoprotein level, duration of diabetes, and type of medication (43).

Patients with higher levels of baseline HbA1c, older adults, obesity participants, active smokers, patients without exercise, patients with comorbidities, patients with more than one OHA, patients receiving insulin treatment, patients from lower tier hospitals, were less likely to achieve the glycemic control, blood (44). Studies conducted in Malaysia found higher self-efficacy scores, shorter duration of diabetes, age, duration of diabetes mellitus and smaller waist circumference were significantly associated with good glycemic control (30, 31).

A study done in Uganda revealed that type 2 diabetes patients frequently have poor glycemic control. It was found that Age was an additional risk component for the patient, and that participants aged 25 to 60 years (AOR=4.48, 95%CI: 1.56 to 14.50, p-value=0.009) and those over 60 years (AOR=4.28, 95%CI: 1.18 to 15.58, p-value=0.03) had worse glycemic control than younger participants aged 18 to 24 years (47).

According to a study from Tunisia, 38% of patients had poor medication adherence, which was linked to poor glycemic control. The percentage of patients with poor glycemic control was also rising with age. In addition, patients with the disease for longer than 20 years after diagnosis had a significantly higher percentage of poor glycemic control. Deficits in health insurance, the use of multiple oral hypoglycemic medications, obesity, a normal body mass index, and non-adherence to diabetic medication are all connected to insufficient glycemic control (48).

A research represent in northern Ethiopia found that participants' knowledge of glycemic control was strongly influenced by their marital status and job placement, that considers glycemic control-related characteristics, marital status, educational attainment, and an occupation were all strongly correlated with glycemic control attitudes and behaviors (49). Another cross sectional study in Southwest Ethiopia found magnitude of poor glycemic control level, 63.8%. Additionally, there are statistically significant variables including low monthly income (COR=3.682, P=0.010), absence of consistent follow-up (COR=3.456, P=000), absence of parental involvement (COR=2.885, P=0.002), educational status (COR=3.656, P=0.002), and diabetes' longer duration (COR=1.820, P=0.003) (50). According to research done in western Ethiopia, age, activity, education level, length of therapy, smoking, and age were all strongly correlated with poor glycemic control in individuals with diabetes(51).

2.4. Conceptual framework

In this conceptual framework, using literatures used in above review (21-51), socio-demographic factors, behavioral factors and clinical factors are considered to be associated to glycemic control level. Furthermore, socio-demographic characteristics are possibly influence or related to behavioral factors where, the later could probably related clinical factors.

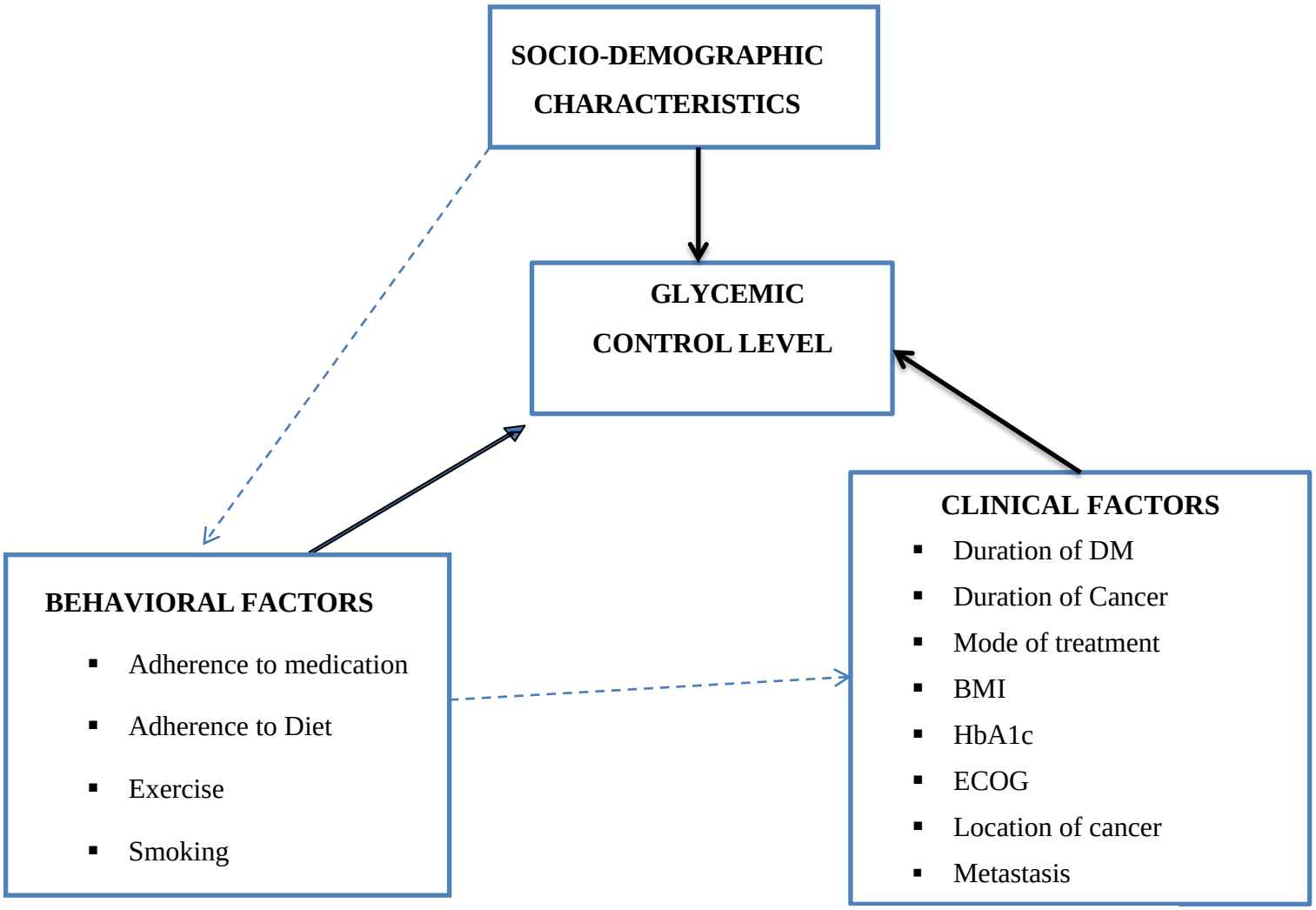

Figure 1; Conceptual framework to glycemic control level and its associated factors among adult cancer patients with comorbid type ii diabetes in public cancer care centers in Addis Ababa.

3. OBJECTIVES

3.1. General objective

General objective of this study is to determine the glycemic control level and associated factors among adult cancer patients with comorbid type-2 Diabetes at cancer care centers in Addis Ababa, Ethiopia.

3.2. Specific objectives

Specific objectives of this study will be;

- To assess glycemic control level among adult cancer patients with comorbid type-2 Diabetes at public cancer care centers in Addis Ababa, Ethiopia.
- To identify factors associated with glycemic control level among adult cancer patients with comorbid type-2 Diabetes Mellitus at public cancer care centers in Addis Ababa, Ethiopia.

4. METHODS AND MATERIAL

4.1. Study area and study period

The Saint Paul's Hospital Millennium Medical College (SPHMMC) and Black Lion Hospital (BLH) in Addis Abeba were chosen as the study's locations because they are both public, publicly funded cancer treatment facilities. SPHMMC is one of the specialized and teaching hospital located in the northwestern part of Addis Ababa a capital city of Ethiopia. Its catchment population is over 5 million making it one of the largest referral centers in the country. As a tertiary center, it receives severely ill patients, which cannot be managing in other hospitals from every corner of the country. The hospital employs more than 2800 clinical, academic, administrative, and other support staff members in addition to about 250 faculty members. More than 700 beds are available for inpatient care, and the hospital serves 1200 outpatients and emergency patients daily on average. BLH is one of the tertiary and teaching hospital in Ethiopia which is located in lideta Sub-city

and dominantly provides cancer screening and treatment for cancer patients. Since its establishment by the Ethiopian government in partnership with the International Atomic Energy Agency in 1997, the oncology unit of BLH has served as the country's primary cancer referral facility. It has an outpatient unit that serves both new and returning patients, as well as a 19-bed in-patient unit for those who must remain in the hospital for their treatment.

4.2. Study period

The study was conducted from February 2023 G.C up to Mar 2023 G.C.

4.3. Study design

In this study cross sectional study design was used.

4.4. Description of Population

4.4.1. Source population

Source population of this study was all cancer patients who had been having clinical follow up at cancer hospitals.

4.4.2. Study population

Adult cancer patients with concurrent type-2 Diabetes at governmental public hospitals (SPHMMC and BLH) made up the study population.

4.4.3. Inclusion criteria

Any type of cancer patients who obtained follow-up care at BLH and SPHMMC, who has been diagnosed with type 2 diabetes mellitus, those who were greater than or equal to 18 years old, cancer patients who have sufficient laboratory profiles and those who have been diagnosed with type 2 DM greater than or equal to six months.

4.4.4. Exclusion Criteria

Those who were critical and with severe condition and those who were not be volunteered to respond.

4.5. Sampling Methods

4.5.1. Sample size calculation

Using a single population proportion calculation, the sample size for this study was calculated at a 95% confidence level using 50% as the proportion of glycemic control level and a 5% margin of error (d=0.05).

Sample size (n)

$$n = \frac{(Z_{\alpha/2})^2 * p\,(1-p)}{d^2}$$

$$n = \frac{(1.96)^2 * 0.5\,(1-0.5)}{(0.05)^2}$$

$$= 384$$

Accordingly, we get final sample size of 384 and since source population is less than 10,000, correction formula (n= n/1+ (n-1)/N) were employed. Using total population of recent cancer with comorbid type 2 diabetic patients 1180 and considering 10% non-response rate, the final required sample size became 318.

4.5.2. Sampling procedure

Sampling technique and procedure of this study followed the following steps: first all adult cancer patient with comorbid type 2 diabetes from both study area (Black Lion hospital oncology unit and Saint Paul's Hospital Millennium Medical College (SPHMMC) were considered. 2nd, based on the eligible criteria mentioned in the above inclusion criteria‟ part, irrelevant participants were excluded from the sample frame and the rest were be proceeded to the next procedure.. Finally, from each study area, participants were selected by convenient sampling technique.

4.6. Operational definitions

Glycemic control: patients were categorized based on American Diabetic Association (ADA) recommendation in to two groups (53).

- Good glycemic control: fasting blood glucose of 70-130 mg/dl.
- Poor glycemic control: fasting blood glucose of <70mg/dl and >130mg/dl.
- Fasting blood sugar: blood glucose measured from venous blood after at least 8 hours of overnight fasting.

4.7. Study variables

Independent variables

Socio-demographic factors

- Age
- Sex
- Marital status
- Work status
- Religion
- Education level
- Residency
- Income

Clinical factors

- Duration of DM
- Duration of Cancer
- Mode of treatment
- BMI
- HbA1c
- ECOG
- Location of cancer
- Metastasis

Dependent variable

- Glycemic control level

4.8. Data collection procedure

Interviewer-administered questionnaire was pretested and composed of a structured questionnaire used. It was contain close-ended questions administered to collect data of glycemic control practice among cancer with comorbid T2D patient and its associated variables. After reviewing literatures used in this document, questionnaire of glycemic control practice and its associated factors were prepared from review of articles used in the literature review. Questions used in this research are consisting of six parts. The first part is sociodemographic data, the second designed for health and treatment characteristics, the third part is concentrated on glycemic control practice questions, the fourth and fifth part were intended to assess associated factors toward glycemic control practice and the last part is a checklist for extracting patient laboratory data. Entire questionnaire were prepared by the English language and then translated to Amharic by language expert as most participants can listen and understand Amharic. Six (6) data collectors took training for 3 days on how to collect the data, about duration, where to collect, saving data and concerns about confidentiality. During data collection, completeness of each questionnaire (whether or not each and every question has been completely answered) was checked daily.

4.9. Data quality control

Data collectors attended a three-day training course on way of collection of the data, duration to collect it, where to collect it, privacy issues, how to use instructions and checklists, and how to save data. As part of the data collection process, collected data was checked daily in accordance with relevant checklists and guidelines. Prior to the actual data collection, the questionnaire was tested with 5% of the SPMMC hospital participants to ensure that the questions were appropriate for the respondents. Questions were modified for some inappropriateness.

4.10. Data analysis

Data was filled kobo toolbox and exported to SPSS program version 26.0 for analysis. The raw data was examined with attention to prevent the loss of important data using the computer password. The process of data cleaning was repeated, this time checking the frequency of each variable to ensure that the data was accurate and that no values were missing. Variables were recoded prior to data analysis in order to facilitate analysis. To determine the relationship between independent variables and glycemic control level, bivariate analysis was used. To find the independent indicators of glycemic control level among cancer patients, multivariate logistic regressions were used. To identify the statistical significance of the relationships between the variables, odds ratios (OR) with 95% confidence intervals (CI) and p-values 0.05 were used. The results of the study are then laid out in text, tables, and graphics.

4.11. Ethical consideration

Permission was sought from the appropriate authority before distributing the questionnaire to the respondents in the manner described below. First, a letter of ethical clearance was gotten from the nursing department at Addis Abeba University. The final support letter was then acquired and approved by the research directorate office of the study area. By withholding respondents' names and keeping their identities a secret, the confidentiality of the data was guaranteed. Written consent was obtained after convincing the respondent who raised the confidentiality concern that the participant was voluntarily filling out the questionnaire and that they had the right to withdraw at any time during the process. Participants received assurances that no harm would be done while the research was being conducted.

4.12. Dissemination of the result

The result of this study presented and defended at the Addis Ababa University department of Nursing and Midwifery. Furthermore, it also distributed to research directorate office of SPHMMC. It presented on different meetings, national conferences and workshops. Then after, it was prepared as manuscript to be published on reputable journals.

5. Results

5.1. Socio-demographic characteristics of study participants

This research included 120 study participants in total; took part in this study; 75 of them, or 62.0%, were female patients. Regarding the age distribution, the study participants' median age was 58 years and ranged from 23 to 85 years, and most 39(32.5%) participants were in the 60-69 years age group. The largest proportion (60.8%) of the study participants were married and 72(60.0%) were Orthodox Christians. Near half of the study participants were illiterate 56 (46.7 %) and 26.7% were self-employed. And more than half of them 80(55.7 %) live in the urban area of the country (Table 1).

Table1 1: Socio-demographic characteristics of the study participants

Variables		Frequency	Percentage
Sex	Female	75	62.0
	Male	45	37.5
Age in years (median age 58 years, ranging from 23-85 years	<40 years	15	12.5
	40-49 years	20	16.7
	50-59 years	28	23.3
	60-69 years	39	32.5
	>70 years	18	15.0
Marital status	Married	73	60.8
	Widowed	28	23.3
	Divorced	8	6.7
	Others	11	9.2
Educational Level	Illiterate	56	46.7
	Degree and above	26	21.7
	Below diploma	23	19.2
	College diploma	15	12.5
Religion	Orthodox	72	60.0

	Muslim	21	17.5
	Protestant	15	12.5
	Others*	12	10.0
Occupations	Self-employed	32	26.7
	Unemployed	31	25.8
	Housewife	28	23.3
	Government employed	20	16.7
	Other**	9	7.5
Residency	Urban	80	55.7
	Rural	40	33.3

Others = single and separated, others*= catholic and wakefeta, others**= Pension, Farmer, Retired.

5.2. Diseases related and clinical factors of cancer

Most 30(25%) study participants were diagnosed and treated for Hematologic cancer, followed by Gynaecological cancer 26(21.7%). According to Eastern Cooperative Oncology Group (ECOG) measurement a significant proportion of participants' Their level of functioning in terms of their physical abilities, daily activity, and capacity for self-care was ECOG-1 100(83.3) and 33 (27.5%) of study participant disease had metastasis to different sites of the body. In terms of treatment history, the majority of the study participants received chemotherapy 87(72.5 %) followed by surgery 15(12.5%), and half 61(50.8%) of them lived about 2-5 years after diagnosis of cancer (Table2)

Table 2 1 Diseases related and clinical factors of cancer of study participants

Variables		Frequency	Percentage
Disease location (tumour site)	Hematologic cancer	30	25
	Gynaecological cancer	26	21.7
	Breast cancer	22	18.3
	Colorectal cancer	14	11.7

	Pancreatic cancer	7	5.8
	Prostate cancer	6	5.0
	Gastric cancer	5	4.2
	Lung	5	4.2
	Others	5	4.1
Metastasis of cancer	No	87	72.5
	Yes	33	27.5
Duration since diagnosis of cancer	< 2years	31	25.8
	2-5 years	61	50.8
	>5 years	28	23.3
ECOG Status	1	100	83.3
	2	19	15.8
	3	1	0.8
Types of Treatment	Chemotherapy	87	72.5
	Surgery	15	12.5
	Radiotherapy	9	7.5
	Others*	9	7.5

Others= head and neck cancer, osteosarcoma, Others*= Chemotherapy + radiotherapy, Surgery + chemotherapy,

5.3. Diseases related and clinical factors of diabetic mellitus.

Regarding fasting blood glucose level, more than half 68 (56.7%) of the study participants were hyperglycaemic (FBG >130mg/dl) and only 38(31.7%) study participants checked their HgA1C values in the last 6 months. Nearly half of the study participants 66(55.0%) had taken oral hypoglycaemic agents followed by Insulin 28(23.3%). More than half 69(57.5%) of the study participant's BMI was in the normal weight (18.5-24.9 kg/m^2) range and only 24 (20.0%) had performed regular exercise. In this study, 52(43.3%) had experienced a

one-time hypoglycaemic attack in the last 6 months followed by two times 29(24.2%) hypoglycaemic attacks (Table 3)

Table 3 1: Diseases related and clinical factors in Diabetic Mellitus patients of study participant

Variables		Frequency	Percentage
Fasting blood glucose	Hypoglycaemia	1	0.8
	Normal	51	42.5
	Hyperglycaemia	68	56.7
HgA1C values in the last 6 months	No	82	68.3
	Yes	38	31.7
Types of Treatment	Insulin + Oral hypoglycaemic agent	15	12.5
	Following dietary plans as recommended	11	9.2
	Insulin alone	28	23.3
	Oral hypoglycaemic agent	66	55.0
Body mass index (BMI)	Underweight	12	10.0
	Normal weight	69	57.5
	Overweight	29	24.2
	Obese	10	8.3
Hypoglycaemic attacks experienced in the last 6 months.	One time	52	43.3
	Two times	29	24.2
	Three times	22	18.3
	More than three times	17	14.2
Regular exercise	No	96	80.0

Yes	24	20.0

5.4. Glycemic control Level

As per the American Diabetic Association (ADA) recommendation, 57.5 (58%)

Of study participants had poor glycemic control level in this study.

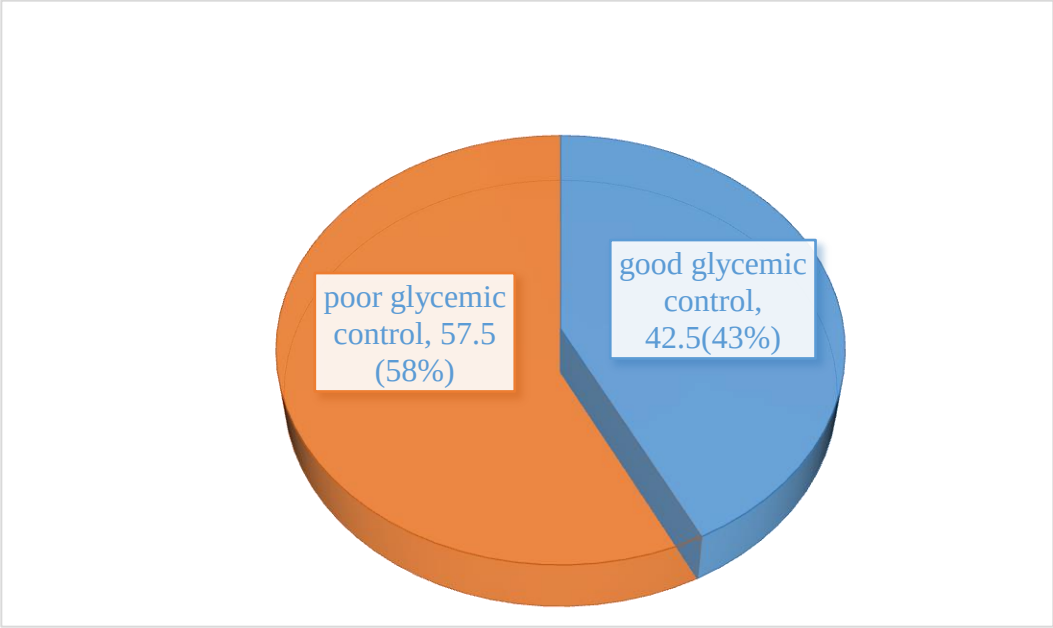

Figure 2; Glycemic control level of adult cancer patients with comorbid type II diabetes the study participants at public cancer care centers, Addis Ababa, 2023.

5.5. Factors associated with good glycemic control level

Bivariate analysis

In the bivariate analysis, nine of the 22 variables studied showed an association with good glycemic control practice with $p < 0.2$. Then, of the nine variables used for multivariate logistic regression analysis, five of which were binary variables (attending diabetic education, forgetting to include fruits in diet, making food choices when eating, regular exercise, and HgA1C); and the rest four variables are multi-categorical variable (Educational level, religion, treatment of Cancer, and treatment of diabetics).

Multivariate logistic regression analysis

Only two variables out of the nine that were employed in the multivariate logistic regression analysis—were shown to be connected with good glycemic control level. By stepwise multivariate logistic regression techniques, with the hierarchical regression technique serving as cross-validation. Patients who were illiterate were 3 times more likely to practice good glycemic control than patients whose educational status was below a diploma (AOR = 3.68, 95% CI: 1.24-10.94, P=0.02), and patients who neglected to include fruits in their diet were 64% less likely to practice good glycemic control (AOR= 0.36, 95% CI: 0.12-1.06, p=0.03).

Table 4 1: *Factors associated with good glycemic control level in adult cancer patients with comorbid type II diabetes.*

Variables	Category	Glycemic control practice		COR of 95% CI	AOR of 95% CI	p-value
		Good	Poor			
Educational level	Below diploma	9	14	1	1	0.07
	College diploma	9	6	1.45(0.54 -3.89)	1.21(0.43-3.39)	0.2
	Degree and above	6	20	0.62(0.19-1.98)	0.67(0.21-2.20)	0.51

	Illiterate	27	29	3.103(1.08-8.89)	3.68(1.24-10.94)	**0.02***
Religion	Catholic	4	3	1	1	0.46
	Muslim	6	15	1.13(0.18-6.94)	2.54(0.30-21.13)	0.39
	Orthodox	30	42	3.75(0.92-15.23)	4.61(0.89-23.81)	0.07
	Wakefeta	2	3	2.10(0.67-6.53)	2.54(0.68-9.48)	0.17
	Protestant	9	6	2.25(0.28-17.76)	4.74(0.41-54.78)	0.21
Attending DM education	Never	41	54	1	1	0.38
	One time	6	12	5.20(0.57-47.69)	5.21(0.46-58.57)	0.18
	Three times and above	1	1	2.9(0.9-9.28)	1.81(0.44-7.56)	0.41
	Two times	3	2	1.37(0.61-3.08)	1.96(0.69-5.48)	0.20
Treatments of cancer	Chemotherapy	36	51	1	1	0.61
	Others*	4	5	0.71(0.22-2.25)	0.55(0.15-2.11)	0.39
	Radiotherapy	6	3	0.63(0.11-3.41)	0.29(0.04-2.23)	0.23
	Surgery	5	10	0.25(0.04-1.44)	0.33(0.04-2.71	0.30
Treatments of DM	Insulin + oral hypoglycemic agent	11	4	1	1	0.09
	Dietary plan	3	8	0.22(0.064-0.77)	0.18(0.03-1.09)	0.06
	Insulin	12	16	1.63(0.39-6.71)	3.75(0.51-27.75)	0.12
	oral hypoglycemic agent	25	41	0.81(0.331-1.99)	0.65(0.21-2.03)	0.46
Forget to	No	46	53	1	1	

include fruits in the dietary plan	Yes	5	16	0.36(0.12-1.06)	0.27(0.08-0.87)	**0.03***
Made food choices during eating	No	1	5	1	1	
	Yes	50	64	3.91(0.44-34.51)	5.44(0.27-109.35)	0.27
Regular exercise	No	44	52	1	1	
	Yes	7	17	0.49(0.185-1.28)	0.67(0.19-2.41)	.543

6. Discussion

The aim of this study was to evaluate glycemic control practice and its associated factors among adult cancer patients with comorbid Type II Diabetes. Diabetes enhances the possibility of infections and being hospitalized in cancer patients, and requiring reductions or cessations of chemotherapy (54). just certain studies looked at the connection between glycemic control and cancer patients' outcomes, whether or not they have diabetes (58). In Ethiopia also there are no studies conducted as my knowledge and it is the first study to evaluate the state of glycemic control practice in cancer patients by measuring fasting blood glucose was considered an important diagnostic tool for assessment of glycemic control practice in cancer patients.

Cancer patients are more likely than the overall population to have diabetes, and its prevalence raises the possibility that these patients will have worse outcomes (58, 56, 57) In this study, the findings showed that almost more than half (57.7%) of the study participants had poor glycemic control (FBG ≥ 130) which was similar with studies commenced in UK and it indicates that poor glycemic control in breast and colorectal cancer can increase mortality compared with good control (60). This might be due to Patients' levels of glycemic control may be affected by cancer therapies like chemotherapy and corticosteroids, and this effect may be exacerbated by patients' propensity to prioritize their cancer care over diabetes management. On the other hand, only 38(31.7%) study participants checked their HgA1C values in the last 6 months; this might be one of the reasons to have poor glycaemic control practices. When compared to patients with good glycemic control, those with poor glycemic control had worse overall and disease-specific survival rates (60). Other study

conducted in USA also indicates that Independent of obesity, hyperglycemia has been linked to a higher risk of developing various cancers (62). As a result, monitoring blood glucose levels was crucial since diabetes increases the risk of infection in individuals whose immune systems had already been reduced by chemotherapy. a healthy balance between dietary intake, exercise, and medication administration is necessary to maintain blood glucose at normal levels and prevent complications associated with diabetes (58). In this study, 93.3% of study participants got dietary education to control the hyperglycaemic event during the cancer treatment and 95.0% of study participants had food choices when less probably to be good glycemic control practice eating out. Due to this comorbidity, maintaining glycemic control during treatment may be an important factor in improving survival. To achieve this balance, persons with diabetes and their healthcare providers must work together actively and effectively, and medication and other treatment components must be modified in accordance with daily blood glucose profiles (59). Good glycemic control level was correlated with low educational attainment (illiteracy). In comparison to patients with educational levels below a diploma, patients with illiteracy were 3.1 times more likely to practice adequate glycemic control (AOR = 3.68, 95% CI: 1.24-10.94, P=0.02).Patients who forgot to include fruits in their dietary plan were negatively correlated with good glycemic control practice and patients who forgot to include fruits in their dietary plan were 64% Unlikely to be an effective glycemic control method (AOR= 0.36, 95% CI: 0.12-1.06, p=0.03). This might be due to patients who had no good dietary plan or who had not maintained their dietary plan having the chance to eat foods that may increase blood glucose.

7. Conclusion

The glycemic control level in adult cancer patients was poor even if most of the study participants got dietary education for the management of diabetic mellitus. Factors associated with good glycemic control practice were educational level and forget to include fruits in their dietary plan.

8. Recommendation

The following recommendations were forwarded.

1. The health office stake holder should work to create awareness about good glycemic control and Diabetes and cancer patients' glycemic state should be managed as part of their treatment strategy.
2. Health care providers: - to impart nutritional knowledge, encourage the inclusion of fruits in the patient's diet, and modify medication and other treatment elements in accordance with the patient's daily blood glucose profiles.

9. Limitations of the Study

The study's findings may not be generalizable to a wider group of cancer patients in the nation who also have comorbid type 2 diabetes due to the lower sample size, to start. Second, the use of fasting blood glucose to gauge the degree of glycemic control (HbA1c was not used for every study participant), as HbA1c does not accurately reflect the degree of glycemic control over a three-month period.

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11.Annexes

Annex 1: Subject Information sheet (English version)

As part of the requirements for master's degree in Addis Ababa University, I have to carry out this research study. This study is concerned with Assessment of glycemic control practice and associated factors among adult cancer patients with comorbid type ii diabetes in public cancer care centers in Addis Ababa, Ethiopia, 2023.

You are being invited to take part in this research. Before you decide to do so, it is important you understand why the research is being done and what it will involve. Please take time to read if you can read or listen to me if you don't want to read when I read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading or listening this.

If you do decide to take part you will be able to keep a copy of this information sheet and you should indicate your agreement to the consent form. You can still withdraw at any time. If you take a part in the study, you will be asked to share your knowledge, attitude and practice according already prepared question. All questions of this research are face to face questions which you are expected to answer all questions by yourself.

There are no other commitments or lifestyle restrictions associated with participating. Participating in the research is not anticipated to cause you any disadvantages or discomfort. The potential physical and/or psychological harm or distress will be the same as any experienced in everyday life. Whilst there are no immediate benefits for those people participating in the study, it is hoped that this work will have a beneficial impact on identifying glycemic control practice and its associated factors for cancer patients with type 2 Diabetes Mellitus in Addis Ababa. Results of this study will be globally published to share to others. If you have any complaints about the research in the first instance you can contact any member of the research team. If you feel your complaint has not been handled to your satisfaction you can contact the Addis Ababa University, office of research and community service using given address.

All the information that we collect about you during the course of the research will be kept strictly confidential. You will not be able to be identified or identifiable in any reports or publications. Any data collected about you will be stored in a form protected by passwords and other relevant security processes and technologies. Data collected may be shared in an anonymized form to allow reuse by the research team and other third parties. These anonymized data will not allow any individuals or their background to be identified or identifiable.

This research is funded by researcher Addis Ababa University.

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Addis Ababa, Ethiopia

School: Addis Ababa University; E-mail: …... Phone no: ++251911073778

Thanks a lot for taking a part in this research

Annex 2: Subject Information sheet (Amharic version)

አባሪዎች 2 የ አማሪኛ መረጃ

በአዲስ አበባ ዩኒቨርሲቲ ለማስተርስ ዲግሪ ከሚያስፈልጉት መስፈርቶች አንዱ ይህንን የምርምር ጥናት ማካሄድ አለብኝ። ይህ ጥናት በአዲስ አበባ፣ ኢትዮጵያ፣ 2023 ውስጥ በሕዝብ የካንሰር እንክብካቤ ማዕከላት ውስጥ ዓይነት II የስኳር በሽታ ባለባቸው የጎልማሶች የካንሰር በሽተኞች የድም ስኩር ቁጥጥር አ ግምገማ እና ተያያዥ ምክንያቶችን ይመለከታል።

በዚህ ጥናት ላይ እንድትሳተፉ ተጋብዘዋል። ይህን ለማድረግ ከመወሰንዎ በፊት ጥናቱ ለምን እየተካሄደ እንደሆነ እና ምን እንደሚያካትቱ መረዳት አስፈላጊ ነው። የሚከተለውን መረጃ በጥንቃቄ ሳነብ ማንበብ ካልፈለጋችሁኝ ለማንበብ ወይም ለመስማት ከቻላችሁ ለማንበብ ጊዜ ወስዳችሁ ከፈለጋችሁ ከሌሎች ጋር ተወያዩ። ግልጽ ያልሆነ ነገር ካለ ወይም ተጨማሪ መረጃ ከፈለጉ ይጠይቁን። ለመሳተፍ መፈለግዎን ወይም አለመፈለግዎን ለመወሰን ጊዜ ይውሰዱ። ይህንን ስላነበቡ ወይም ስላዳመጡ እናመሰግናለን።

ለመሳተፍ ከወሰኑ የዚህን የመረጃ ወረቀት ቅጂ መያዝ ይችላሉ እና ስምምነትዎን በፍቃድ ቅጹ ላይ ማመልከት አለብዎት። አሁንም በማንኛውም ጊዜ ማውጣት ይችላሉ። በጥናቱ ውስጥ ይሳተፉ, አስቀድመው በተዘጋጀው ጥያቄ መሰረት የእርስዎን እውቀት, አመለካከት እና ልምምድ እንዲያካፍሉ ይጠየቃሉ. የዚህ ጥናት ሁሉም ጥያቄዎች ፊት ለፊት የሚቀርቡ ጥያቄዎች ሲሆኑ ሁሉንም ጥያቄዎች በራስዎ እንዲመልሱ የሚጠበቁ ናቸው።

ከመሳተፍ ጋር የተያያዙ ሌሎች ቁርጠኝነት ወይም የአኗኗር ዘይቤ ገደቦች የሉም። በምርምርው ውስጥ መሳተፍ ምንም አይነት ጉዳት ወይም ምቾት ያመጣል ተብሎ አይጠበቅም። ሊከሰት የሚችለው አካላዊ እና/ወይም ስነልቦናዊ ጉዳት ወይም ጭንቀት እንደማንኛውም በዕለት ተዕለት ኑሮ ውስጥ ካለ ልምድ ጋር ተመሳሳይ ይሆናል። በጥናቱ ላይ ለሚሳተፉ ሰዎች አፋጣኝ ጥቅማጥቅሞች ባይኖሩም ይህ ሥራ በአዲስ አበባ ውስጥ ዓይነት 2 የስኳር በሽታ ላለባቸው የካንሰር ሕሙማን የ ድም ስኳር ቁጥጥር አሰራርን እና ተያያዥ ምክንያቶችን በመለየት ላይ ጠቃሚ ተጽእኖ ይኖረዋል ተብሎ ይጠበቃል። የዚህ ጥናት ውጤቶች ለሌሎች ለመካፈል በአለም አቀፍ ደረጃ ይታተማሉ። በመጀመሪያ ደረጃ በምርምር ላይ ቅሬታዎች ካሉዎት ማንኛውንም የምርምር ቡድን አባል ማግኘት ይችላሉ። ቅሬታዎ በእርስዎ እርካታ እንዳልተስተናገደ

ከተሰማዎት አዲስ አበባ ዩኒቨርሲቲ፣ የምርምር እና የማህበረሰብ አገልግሎት ቢሮ በተሰጠዎት አድራሻ ማግኘት ይችላሉ።

በጥናቱ ወቅት ስለእርስዎ የምንሰበስበው መረጃ በሙሉ በሚስጥር ይጠበቃል። በማናቸውም ሪፖርቶች ወይም ህትመቶች ውስጥ ሊታወቁ ወይም ሊታወቁ አይችሉም. ስለእርስዎ የሚሰበሰብ ማንኛውም መረጃ በይለፍ ቃል እና ሌሎች ተዛማጅ የደህንነት ሂደቶች እና ቴክኖሎጂዎች በተጠበቀ ቅጽ ውስጥ ይከማቻል። በምርምር ቡድኑ እና በሌሎች ሶስተኛ ወገኖች እንደገና ጥቅም ላይ እንዲውል ለማድረግ የተሰበሰበው መረጃ ስም-አልባ በሆነ መልኩ ሊጋራ ይችላል። እነዚህ ስም-አልባ መረጃዎች ማንኛቸውም ግለሰቦች ወይም አስተዳደጋቸው እንዲታወቅ ወይም እንዲታወቅ አይፈቅድም።

ይህ ጥናት በአዲስ አበባ ዩኒቨርሲቲ የካንኮሎጂ ነርሲንግ ሁለተኛ ዲግሪ ተማሪ በሆነው በተመራማሪዋ አዲስዓለም ጌታቸው (ቢኤስሲ) በራሱ የገንዘብ ድጋፍ የተደረገ ነው።

ለበለጠ መረጃ ወይም ስለዚህ ምርምር ማብራሪያ ለማግኘት አድራሻዎች

ተመራማዋ፡ አዲስዓለም ጌታቸው.; ኢ-ሜል ----------; ስልክ ቁጥር: ----------

የተመራማሪው አማካሪ፡ ፍቃዱ አጋሀ (PHD); ኢመይል፡……; ስልክ ቁጥር፡ … .....;አዲስ አበባ፣ ኢትዮጵያ…

አዲስ አበባ፣ ኢትዮጵያ

ትምህርት ቤት: አዲስ አበባ ዩኒቨርሲቲ; ኢሜል፡..... ; ስልክ ቁጥር፡ +251911073778

በዚህ ጥናት ውስጥ ስለተሳተፉ በጣም እናመሰግናለን!

Annex 3: Informed consent (English version)

I……agreed to participate in the research study so called, Assessment of glycemic control practice and associated factors among adult cancer patients with comorbid type ii diabetes in public cancer care centers in Addis Ababa, Ethiopia.

The purpose and nature of the study has been explained to me in writing and I am participating voluntarily. So, I would like to express my permission to be responded.

I understand that I can withdraw from the study, without repercussions, at any time, whether before it starts or while I am participating.

Are you willing to participate? Please encircle the number according to your wish!

1. Yes = continue 2. No = thank you

Participant‟s Signature----------Date ------/---/ ----------Signature ____/___/____

Data collector‟s name ----------Date ------/---/----------Signature ____/___/_____

Respondent ID no: _____

Thank you for your purposive participation and listening!

Annex 4: Informed consent (Amharic version)

አባሪዎች ለ. የ አማሪኛ ቅጂ የስምምነት ቅጽ

የጥናቱ አላማ እና ባህሪ በጽሁፍ ተብራርቶልኝ በፍቃደኝነት እየተሳተፍኩ ነው። ስለዚህ ምላሽ እንድሰጥ ፈቃዴን መግለጽ እፈልጋለሁ።

ከመጀመሩ በፊትም ሆነ በምሳተፍበት ጊዜ፣ ምንም አይነት ውጤት ሳያስከትል፣ ከጥናቱ መውጣት እንደምችል ተረድቻለሁ።

ለመሳተፍ ፈቃደኛ ነህ? እባኮትን እንደፍላጎትዎ ቁጥር ምለከተ ያድረጉ!

1. አዎ = ቀጥል 2. አይ = አመሰግናለሁ

የተሳታፊ ፊርማ ---------- ቀን ------/---/ ---------- ፊርማ ____/__/_____

የመረጃ ሰብሳቢው ስም ---------- ቀን---------- ፊርማ ___/__/_____

የ ተሳታፊ መታወቂያ ቁጥር፡- _____

ስላሳዩት አወንታዊ ተሳትፎ እና ማዳመጥ እናመሰግናለን!

Annex 5: Questionnaire (English version)

Part 1: socio-demographic characteristics

s. no	Questions	Alternatives/choices of response
101	Age	age in completed years---------
102	Sex	1. Male 2. Female
103	Education level	1. Illiterate 2. Below diploma 3. college diploma 4. degree and above
104	What is your religion?	1. Orthodox 2. Catholic 3. Protestant 4. Muslim 5. Other (Specify)……
105	What is your marital status now?	1. single 2. Married 3. Widowed 4. Divorced 5. Separated 6. Other……

106	What is your occupation?	1. Unemployed 2. Government/private employee 3. Self employed 4. Other……
107	Where is your residency?	1. Urban 2. Rural
108	What is your monthly income	_____(in birr)

Part 2: Health and treatment characteristics

201	What type of cancer do you have?	_____
202	Is your cancer is metastasized	1. Yes 2. No
203	How many years back were you diagnosed by health professional to have cancer?	- ----------years.
204	How many years back were you diagnosed by health professional to have diabetes?	- ----------years.
205	How many hypoglycemic attacks have you been experienced in last six month?	1 .One time 2.Two time 3.Three time 4.more than three attacks
206	Have you ever got dietary education?	1. Yes 2. No
207	How many times in last year have you attended the diabetes education?	1. One time 2. Two time 3. Three time and above

208	What is optimum blood sugar level you should achieve to prevent diabetes related complication?	1. ..... mg/dl 2. I don‟t know
209	Which treatment type you are following currently for your cancer?	1. Chemotherapy 2. Radiotherapy 3. chemoradiation 4. surgery
210	Which drug regimen you are following currently for your Diabetes?	1. Oral anti diabetic agents alone 2. Insulin alone 3. Both Insulin and oral anti diabetic agents 4. Following dietary plan as Recommended

Part 3: glycemic control practice

301	Do you forget to plan the meals you eat ahead?	1. Yes 2. No
302	Did you miss your dietary plan yesterday?	1. Yes 2. No
303	Over the past two weeks, were there any days when you did not take your dietary plan properly?	1. Yes 2. No
304	Do you sometimes forget to comply your dietary plan with everyday life?	1. Yes 2. No
305	Did you have feelings of dietary deprivation?	1. Yes 2. No
306	Did you forget to include fruits in your vegetables, food daily?	1. Yes 2. No

Part 4: behavioral and social condition

401	Did you make food choice when eating out	1. Yes 2. No
402	Do you have regular exercise?	1. Yes 2. No
403	If yes to question number 402, can you mention type of your exercise (s)	_____

Part 5: Diet related factors

501	Do you find difficulty of food selection in your daily meals?	1. Yes 2. No
502	Do you sometimes skip your meal?	1. Yes 2. No
503	Do you get nutrition education?	1. Yes 2. No
504	Do you sometimes fast?	1. Yes 2. 2. No

Part 6: Checklist to review patient's medical record

601	Patient ECOG performance states scale	1. grade 0 2. grade 1 3. grade 2 4. grade 3 5. grade 4 6. grade 5
602	Last three fasting blood sugar	_____mg/dl
603	Had HbA1c value in last six months?	1. Yes 2. No
604	If yes for Q 603 value of HbA1c	_____mg/dl
605	Weight	
606	Height	
607	BMI	

Annex 6: Questionnaire (Amharic version)

የእንግሊዝኛ ቅጂ መጠይቅ

ክፍል 1: ማህበራዊ-ስነ-ሕዝብ ባህሪያት

ተ.ቁ	ጥያቄዎች	አማራጮች / የምላሽ ምርጫዎች
101	ዕድሜ	
102	Sex	
103	የትምህርት ደረጃ	1. ያለተማረ 2. የመጀመሪያ ደረጃ ትምህርት ቤት 3. ሁለተኛ ደረጃ ትምህርት ቤት 4. የኮሌጅ ዲፕሎማ 5. ዲግሪ
103	ሃይማኖትዎ?	1. ኦርቶዶክስ 2. ካቶሊክ 3. ፕሮቴስታንት 4. ሙስሊም 5. ሌላ (ይግለጹ) …….
104	አሁን የጋብቻ ሁኔታዎ ?	1. ያለገባ 2. ያገባ 3. መበለት 4. የተፋታ 5. ሌላ …….

105	ሥራህ ምንድን ነው?	1. ሥራ አጥ 2. የመንግስት/የግል ሰራተኛ 3. በራስ ተቀጣሪ 4. ሌላ
106	የመኖሪያ ቦታዎ የት ነው?	1. ከተማ 2. ገጠር
108	ወርሃዊ ገቢህ ስንት ነው።	(በብር)

ክፍል 2: የጤና እና የሕክምና ባህሪያት

201	ምን አይነት ካንሰር አለዎ?	_____
202	ካንሰርዎ ተስራቸቶለ?	1. አዎ 2. አይደለ
203	ከስንት አመት በፊት በጤና ባለሙያ ካንሰር እንዳለብዎት ታወቀ?	---- ዓመታት።
204	ከስንት አመታት በፊት በጤና ባለሙያ የስኳር በሽታ እንዳለቦት ታወቀ?	----- ዓመታት።
205	ባለፉት ስድስት ወራት ውስጥ ምን ያህል ጊዚ የ ድም ስኩር ማንሰ አጋጥመውዎታል?	1. 1 አንድ ጊዜ 2. ሁለት ጊዜ 3. ሶስት ጊዜ 4. ከሦስት በላይ
206	የአመጋገብ ትምህርት አግኝተህ ታውቃለህ?	1. አዎ 2. አይደለ

207	ባለፈው አመት ውስጥ ስንት ጊዜ የስኪር ትምህርትን ተከታትለዋል?	1. አንድ ጊዜ 2. ሁለት ጊዜ 3. ሶስት ጊዜ 4. ከሦስት በላይ
208	ከስኪር በሽታ ጋር የተዛመዱ ችግሮችን ለመከላከል ምን ያህል ጥሩ የደም ስኪር መጠን ማግኘት አለብዎት?	_____mg/dl
208	በአሁኑ ጊዜ ለካንሰርዎ የትኛውን የሕክምና ዓይነት እየተከተሉ ነው?	1. ኪሞቴራፒ 2. የቸረረ ሕክምና 3. ኪሞሬዲሽን 4. ቀዶ ጥገና
209	በአሁኑ ጊዜ ለስኪር ህመምዎ የትኛውን መድሃኒትእየተከተሉ ነው?	1. የሚዋጥ መድኃኒቶች ብቻ 2. ኢንሱሊን ብቻ 3. ኢንሱሊን እና የሚዋጥ መድሃኒቶች 4. 4. በተመከረው መሰረት የአመጋገብ እቅድን መከተል ብቻ

ክፍል 3: ብ ድም ውስጥያለ የስኪር ቁጥጥር ልምምድ

301	የሚበሉትን ምግቦች አስቀድመው ማቀድ ይረሳሉ?	1. አዎ
		2.አይደለም
302	ባለፉት ሁለት ሳምንታት ውስጥ የአመጋገብ እቅድዎን በትክክል ያልወሰዱባቸው ቀናት ነበሩ?	1.አዎ 2.አይደለም
304	አንዳንድ ጊዜ የአመጋገብ ዕቅድዎን ከዕለት ተዕለት ሕይወት ጋር ማክበርን ይረሳሉ?	1.አዎ 2.አይደለም
305	አትክልቶች ና ፍራፍሬዎችን በየቀኑ ይምግብ?	1. አዎ 2.አይደለም

ክፍል 4: ባህሪ ሁኔታ

401	መደበኛ የአካል ብቃት እንቅስቃሴ አለዎ?	3. አዎ 2.አይደለም

ክፍል 5፡ ከአመጋገብ ጋር የተያያዙ ምክንያቶች

501	በዕለት ተዕለት ምግብዎ ውስጥ የምግብ ምርጫን አስቸጋሪ ይሆንብዎታል?	1. አዎ 2. 2.አይደለም
503	የአመጋገብ ትምህርት ያገኛሉ?	8. አዎ
		2.አይደለም
504	አንዳንድ ጊዜ ትጾማለህ?	8. አዎ 2.አይደለም

ክፍል 6፡ የታካሚውን የህክምና መዝገብ ለመገምገም የማረጋገጫ ዝርዝር

601	የታካሚ የ ECOG አፈጻጸም ሁኔታ ልኬት	1. grade 0 2. grade 1 _____ 3. grade 2 4. grade 3 5. grade 4 6. grade 5
602	የመጨረሻዎቹ የጾም የደም ስኳር ምጥን	_____mg/dl
604	ባለፉት ስድስት ወራት ውስጥ የHbA1c ምጥን ነበረው?	1.አዎ 2.አይደለም
605	ክብደት	
606	ቁመት	
607	BMI	

Annex7: Approval

ADDIS ABABA UNIVERSITY
COLLEGE HEALTH SCIENCE SCHOOL
DEPARTMENT OF NURSING AND MIDWIFERY

I, the undersigned MSc student, declare that I have submitted my original work on a title "Assessment of glycemic control practice and its associated factors among adult cancer patients with comorbid type II diabetes in public cancer care centers in Addis Ababa, 2023" for the examination.

Submitted by:

		7/6/2023
Addisalem getachew, Bsc		
Name of student	Signature	Date

This thesis work has been submitted for examination with my approval as an advisor.
Approved by:

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Name of Co-Advisor	Signature	Date
Yosief		7/6/2023
Name of examiner	Signature	Date

STATEMENT OF DECLARATION

By my signature below, I declare and affirm that this thesis is my own work. I have followed all ethical principles of scholarship in the preparation, data collection, 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.

This thesis is submitted in partial fulfillment of the requirement for a graduate degree from Addis Ababa University at College of Health Sciences, School of Nursing and Midwifery. The thesis is deposited in the Addis Ababa University Digital Library and is made available to the local, national, and international scientific communities. I solemnly declare that this thesis has not been submitted to any other institution anywhere for the award of any academic degree, diploma or certificate.

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