



ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCE SCHOOL OF MEDICINE
DEPARTMENT OF INTERNAL MEDICINE

**EFFECT OF CHRISTIAN ORTHODOX FASTING ON GLYCEMIC AND
BLOOD PRESSURE CONTROL AMONG TYPE 2 DIABETIC PATIENTS
IN TIKUR ANBESSA SPECIALIZED HOSPITAL, ADDIS ABABA,
ETHIOPIA, 2024**

**INVESTIGATOR: DR Fasika Gintamo (MD, INTERNAL MEDICINE
RESIDENT)**

**ADVISOR: DR PAULOS EFREM (CONSULTANT INTERNIST AND
ENDOCRINOLOGIST)**

November, 2024

Addis Ababa, Ethiopia

ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCE SCHOOL OF MEDICINE
DEPARTMENT OF INTERNAL MEDICINE

EFFECT OF CHRISTIAN ORTHODOX FASTING ON GLYCEMIC AND BLOOD
PRESSURE CONTROL AMONG TYPE 2 DIABETIC PATIENTS IN TIKUR ANBESSA
SPECIALIZED HOSPITAL, ADDIS ABABA, ETHIOPIA, 2024

INVESTIGATOR: DR FASIKA GINTAMO (MD, INTERNAL MEDICINE RESIDENT)

ADVISOR: DR PAULOS EFREM (CONSULTANT INTERNIST AND
ENDOCRINOLOGIST)

A RESEARCH THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY COLLEGE OF
MEDICINE AND HEALTH SCIENCE, DEPARTMENT OF INTERNAL MEDICINE FOR
THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR CERTIFICATION OF
SPECIALTY IN INTERNAL MEDICINE

November, 2024

Addis Ababa, Ethiopia

Declaration

I, Fasika Gintamo, do hereby declare that this research thesis is a result of the works of my own making except where due is made in a review of previous literature in the content and by my knowledge, has never been submitted for any prior academic award or qualification in this Institution.

Fasika Gintamo : Signed : _____ Date: _____

Email: fasiconeba@gmail.com

Phone: +251 91 097 5267

Approval of thesis submission

I hereby certify that I have read this thesis prepared under my direction and recommend that it can be accepted as fulfilling the thesis requirement.

Name of Thesis Advisor _____ Signature _____ Date _____

Name of Head of Department _____ Signature _____ Date _____

Acknowledgment

I want to thank Addis Ababa University's Department of Internal Medicine first and foremost for providing me with this chance. Additionally, I would like to express our sincere appreciation to my advisor Dr. Paulos for his thorough direction, inspiration, and helpful criticism during the proposal creation. I would like to thank the study participants for spending their time to fill the research questioners.

Table of content

Acknowledgment	1
Table of content	ii
List of table	iii
List of figure	Error! Bookmark not defined.
Acronyms/abbreviations	iv
Abstract	v
1. Introduction	6
1.1 Background.....	6
1.2 Statements of the problem.....	2
1.3 Significant of the study	3
2. Literature review	4
2.1 Overview of fasting on glycaemic control and blood pressure control	4
2.2 Trend of glycaemic control and blood pressure control	5
2.3 Conceptual Framework	7
3. Objectives	8
3.1 General objective	8
3.2 Specific objectives	8
4. Methods	9
4.1 Study area and period.....	9
4.3 populations	9
4.4 Eligibility	10
4.5 Sample Size Determination	10
4.7 study variables	11
4.14. Data quality assurance.....	12
4.15. Ethical Consideration	12
4.16. Plan for Dissemination the Result.....	13
5. Result.....	13
6. Discussion.....	17
7. Strength and limitations	18

8. Conclusions and recommendations.....	18
---	----

List of table

Table 1: Socio-demographic characteristics of type 2 diabetic patients at Tikur Anbessa Specialized Hospital, 2024(n=68).....	13
Table 2: Diabetic related Clinical information of diabetic patients at Tikur Anbessa Specialized Hospital, 2024(n=68).....	14

List of figures

Figure 1: Effect of Christian Orthodox Fasting On Glycemic Control and Blood Pressure Control, 2024(10,37).....	7
Figure 2: Trends in mean FBS before fasting, mid-fasting, and at the end of fasting among patients with type 2 diabetes at TASH,2024.....	15
Figure 3: Changes in Mean Systolic and DBP in pre- post fasting in Patients with type 2 diabetes at TASH, 2024.....	18

Acronyms/abbreviations

BP: Blood pressure

DM–Diabetes Mellitus

ETB–Ethiopian Birr

HCPs–Health Care Providers

IDF–International Diabetic’s Federation

IGT–Impaired Glucose Test

PI–Principal Investigator

WHO–World Health Organization

OF–Orthodox religious fasting

Abstract

Introduction: Type 2 diabetes mellitus (T2DM), frequently complicated by hypertension, poses significant challenges in low-resource settings. Structured fasting, a religiously relevant practice in regions like Ethiopia, remains understudied for its metabolic benefits and risks.

Objective: To assess the effect of Christian orthodox fasting on glycemic and blood pressure control among type 2 diabetic patients in Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, 2024.

Methods: Institutional based : observational longitudinal study was conducted from August 7 to August 22, 2024, at Tikur Anbessa Specialized Hospital in Addis Ababa, Ethiopia. Seventy patients who had been fasting during the Assumption fast and attended the outpatient clinic were selected using convenience sampling. Data were entered into SPSS version 26 for cleaning and analysis. A paired t-test assessed the significance of differences between the means of two sets of data.

Result: This study was conducted on 68 patients with type 2 diabetes, with a mean age of 56.5 years and 52.9% of participants being male. The study demonstrated that mean fasting significantly reduced fasting blood glucose by 19.56 mg/dL ($p=0.001$). Glycemic control within the target range of 80–130 mg/dL improved from 67.6% to 91.2% after fasting. Mean blood pressure also improved, with systolic blood pressure decreasing by 9.19 mmHg and diastolic blood pressure by 9.44 mmHg ($p=0.001$). Additionally, the proportion of patients exceeding hypertensive thresholds (SBP >130 mmHg, DBP >80 mmHg) declined by 19.2% and 38.3%, respectively, after fasting.

Conclusion and recommendation: Fasting significantly improved glycemic control and blood pressure management. It should be incorporated into diabetes management with personalized protocols and monitoring. Multicenter trials with diverse cohorts and long-term follow-up are needed to validate sustainability and refine protocols.

Keywords: Type 2 diabetes, fasting, glycemic control, blood pressure, Ethiopia.

1. Introduction

1.1 Background

Religious fasting is a significant period of spiritual growth and may impact physical health. The Coptic Orthodox Church mandates dietary restrictions and fasting for 220-250 days annually. While studies on the relationship between fasting and health have been conducted, Orthodox Christianity fasting has limited research. Orthodox Christianity has three principal fasting periods. Among these, the 40-day fast preceding Christmas excludes the consumption of meat, dairy products, and eggs. Additionally, the 55-day Lenten fast leading up to Easter follows similar dietary restrictions. Furthermore, the 15-day Assumption Fast in August adheres to the same dietary guidelines as Lent. It is a stringent abstinence period with no food or drink encouraged for those who can tolerate it. The church traditionally observes a time of abstinence from midnight until sunset(2).

Fasting can take various forms, including time-restricted eating (TRE), periodic fasting (PFT), and alternate-day fasting (ADF). PFT allows for up to 24 hours of fasting on particular days of the week, with ad libitum food consumption on the other days. ADF allows for flexible food intake and fasting days throughout the week, with some protocols recommending no food intake on fast days. These alternative dietary approaches are gaining popularity globally due to their ability to improve human health(3).

Diabetes mellitus is a global public health issue resulting from elevated blood glucose levels due to the inability of the pancreas to produce or properly use insulin(4,5). The World Health Organization aims to reduce premature mortality from non-communicable diseases by one-third by 2030(6). DM is a silent disease that has been highlighted as one of the world's fastest-growing risks to public health(7).

Fasting for extended periods contradicts established diabetic treatment practices.

To prevent hyperglycemia and hypoglycemia, it is important to manage nutritional consumption, exercise regularly, and coordinate with medical treatments to reduce blood

glucose levels. Combining fasting with glucose-lowering drugs might complicate diabetic care, especially in terms of hypoglycemia. Medical opinion is mixed on whether it is safe, especially for those with well-controlled diabetes(8).

Orthodox religious fasting (OF) has been proven to have a positive effect on dyslipidemia, lowering total cholesterol and LDL-C levels in Orthodox populations without comorbidities. This is most likely due to lifestyle changes connected to OF that extend beyond eating patterns. (9).

To successfully manage the risk of long-term diabetic complications, good glycemic management is essential. Poor glycaemic control in diabetes patients is a major public health issue and the greatest risk for the development of diabetic complications. Diabetes mellitus that is uncontrolled causes micro- and macro-vascular complications. Furthermore, many difficulties are the result of poorly managed diabetes is a leading cause of disability, untimely death, and poor quality of life(10,11).

1.2 Statements of the problem

Diabetes prevalence is increasing globally, reaching 10% in Western-adopting countries like China and India (12). Diabetes, causing 4.9 million deaths and 11% of global health costs, is expected to become the seventh leading cause of mortality by 2030, disproportionately affecting underdeveloped countries(13,14). Diabetes, a chronic condition, is increasing globally, particularly in underdeveloped countries due to factors like increased lifespan, obesity, unhealthy diets, sedentary lifestyles, and urbanization(15,16).

Fasting, a voluntary abstinence from food has been linked to increased longevity and health benefits. Religious fasting (RF), a nutritional model aiming for soul and body purgation, has gained popularity worldwide. Studies suggest RF positively prevents cardiovascular disease, type 2 diabetes, and obesity(17).

Diabetes prevalence is expected to rise globally, impacting health resources in undeveloped Sub-Saharan Africa, burdening diabetics and their families, and exacerbated by life-threatening diseases like malaria and tuberculosis(18,19).

Egypt will face nine million diabetes cases by 2025, requiring preventive measures and improved patient education to reduce disease-related problems and complications. Physical

activity and dietary changes contribute to diabetes development(20). Ethiopia's diabetes prevalence increased from 3.5% in 2011 to 4.36% in 2013, with 34,262 deaths and 1.39 million undiagnosed cases in 2013 (21).

Over nutrition, obesity, urbanization, and hygiene changes may increase the risk of developing diabetes in Ethiopia. To prevent and control the disease, health education and increased awareness among DM patients are necessary(22). Ethiopia faces increasing chronic diseases, particularly diabetes, requiring effective prevention and therapeutic strategies to improve treatment success and disease consequences(23,24).

Age, body mass index, waist-to-hip ratio, blood pressure, fasting plasma glucose, glycated hemoglobin, lipid profiles, albuminuria, smoking and family history of diabetes, gender, type of DM, duration of illness, medication type, and a negative attitude toward DM were the most common risk factors for DM complications. To identify these risk factors, investigating the level of knowledge and practice of DM patients is important. This identification leads to the baseline for health education planning and performances(12).

Fasting patients frequently have to adapt their eating choices, daily physical activity, and sleeping patterns owing to physiological shifts and homoeostatic changes. Fasting can have an impact on lipid profiles, body weight, and blood glucose management in individuals with Type 2 diabetes, necessitating medication modifications. The usage of drugs during the day may contradict fasting principles. Some patients fast owing to religious beliefs, while others are exempt from fasting due to chronic illnesses, pregnancy, or breastfeeding(25).

1.3 Significant of the study

Determining the effect of Christian orthodox fasting on glycemic and blood pressure control among type 2 diabetic patients is an important starting point to show the health effects of Orthodox Christian fasting on type 2 DM patients, and for designing and implementing a health education program. The current study is significant since it determines the impacts of fasting on glycemic control and blood pressure control among diabetic patients. Ethiopian Orthodox Christians fast every Wednesday and Friday, as well as for prolonged periods during Lent, Christmas, and Assumption. This fasting method combines energy restriction and TRE by skipping meals and following a fasting diet.

Investigating the impact of Christian Orthodox fasting on glycemic control and blood pressure management among type 2 diabetes patients at Tikur Anbessa Specialized Hospital

is of paramount clinical and public health significance. Many individuals adhering to the Christian Orthodox faith, including those with chronic metabolic disorders such as diabetes, actively participate in religious fasting during designated periods. Orthodox fasting entails complete abstinence from food and beverages from midnight until sunset, a practice deeply rooted in ecclesiastical tradition. Given the physiological demands of diabetes management, understanding the implications of this fasting regimen on glycemic control and blood pressure regulation is essential for optimizing patient care. This study aims to provide evidence-based insights into the metabolic adaptations associated with Orthodox fasting, thereby providing tailored medical guidance for diabetic patients participating in this religious practice.

2. Literature review

2.1 Overview of fasting on glycaemic control and blood pressure control

Hypertension and type 2 diabetes are prevalent chronic conditions with overlapping risk factors such as obesity, dietary habits, and insulin resistance. The relationship between hypertension and T2D is intricate due to the shared risk factors and the utilization of distinct medications. Elevated blood pressure heightens the risk of developing type 2 diabetes by approximately 80% for every 20 mmHg rise in systolic blood pressure. Common antihypertensive medications like thiazide diuretics and β -blockers are associated with an increased incidence of new-onset type 2 diabetes, whereas angiotensin-converting enzyme inhibitors and angiotensin II receptor blockers do not have this effect (26).

Hypertension and diabetes are major public health issues globally, with coexisting diseases affecting glycemic and cardiovascular outcomes. Lifestyle, dyslipidemia, family history, and race are all risk factors. Complications may be microvascular or macrovascular. Inadequate glycemic management leads to diabetes-related diseases and complications, raising medical expenses and shortening life expectancy. Improving glycemic control can help patients live longer, have a better quality of life, and avoid diabetes complications(27).

Proper blood pressure and blood glucose control can significantly reduce cardiovascular outcomes, making it a crucial clinical and public health concern. Care for hypertension and diabetes is ineffective compared to affluent nations, causing significant health harm and economic loss. This also raises issues about the treatment results of blood pressure and blood

glucose in comorbid individuals, including if they are less well-controlled than those with either illness alone(28).

Diabetes prevalence in Ethiopia is increasing, with 4.9 million people aged 20-79 living with this condition and 26.9% suffering from impaired glucose tolerance. Poor control of glycemic, blood pressure, and lipid levels is linked to the development of complications like diabetic retinopathy and nephropathy. However, patients with T2DM with poor lipid, blood pressure, and glycemic control are at higher risk for cardiovascular complications(29).

Lifestyle modifications are the most effective method to avoid or postpone the onset of diabetes. To help prevent diabetes and its consequences, persons should: maintain a healthy body weight, engage in at least 30 minutes of moderate activity each day, consume a healthy diet low in sugar and saturated fat, and avoid smoking(30).

2.2 Trend of glycaemic control and blood pressure control

Diabetes became the first non-communicable disease declared an epidemic by the World Health Organization(31). Global reports show that Population-based interventions targeting modifiable risk factors can reduce diabetes incidence and lower blood pressure and cardiovascular risk variables with strong hints for direct proof(32). According to India's research results, high undiagnosed diabetic mellitus cases and inadequate information contribute to premature death, costly complications, and financial burden(33).

A study involving 1592 records from Middle Eastern and Asian countries found that 12 studies, including 5554 participants, showed a significant decrease in HbA1c and FBG levels after fasting compared to pre-fasting levels. The quality of the retrieved studies ranged from 83% to 17%. However, the difference in body weight in fasting patients after fasting versus pre-fasting was non-significant(34).

A systematic review and meta-analysis of 14 studies found that religious fasting practices reduce certain biomarkers of cardiometabolic disease risk factors. Observing fasting during Ramadan and Orthodox Christian fasting was associated with decreased systolic blood pressure and reduced total cholesterol (35).

The study investigates the effects of Christian fasting on type 2 diabetes patients among Egyptian Coptic Orthodox Christians, Fasting among Orthodox Christians has been shown to improve the health of patients with type 2 diabetes, as well as some benefits for non-

diabetics(1). Another study in Tripoli, Libya found that fasting can affect lipid profiles, body weight, and blood glucose control in people with type 2 diabetes. The study discovered that the mean values for males and females significantly decreased after fasting (43).

Research done at Hawassa University in Ethiopia discovered that fasting patients exhibited a higher increase in HDL-c (7.78%) compared to the non-fasting group (3.85%), yet this disparity did not reach statistical significance (3.9%; 95% CI: -1.3 to 9.2, $p=0.138$). Some abnormal parameters demonstrated a decreasing trend in the final week of fasting in contrast to baseline values, including SBP (from 100 to 73.1%), FBS (from 96.1 to 76.9%), TC (from 53.8 to 15.4%), and TC/HDL-c ratio (from 65.4 to 57.7%). There were no observed changes in other lipid profiles such as TG, LDL-c, and HDL-c during the last week of fasting compared to baseline abnormalities (36).

A study conducted at Police Referral Hospital in Ethiopia found that out of 414 participants, with successful interviews conducted for 361 individuals, among these, 57.1% successfully reached their target blood pressure levels, while only 19.4% of those with hypertensive and diabetics achieved the recommended BP target. Merely 39.3% of participants had an FPG level below 130mg/dl. Notably, 24.1% controlled both BP and FPG levels. Ultimately, the research concluded that the percentage of type 2 diabetes patients attaining target blood pressure, fasting plasma glucose levels, or both fell short of optimal levels (29).

A cross-sectional study conducted at Tikur Anbessa Specialized Hospital in Addis Ababa assessed glycemic control among outpatient type 2 diabetes patients. The results revealed poor glycemic control in a majority (56.9%) of participants, with only a small fraction (26.2%) achieving good control. High fasting blood glucose was prevalent, affecting over half the patients. The finding highlights a significant challenge in managing type 2 diabetes among the studied population (37).

2.3 Conceptual Framework

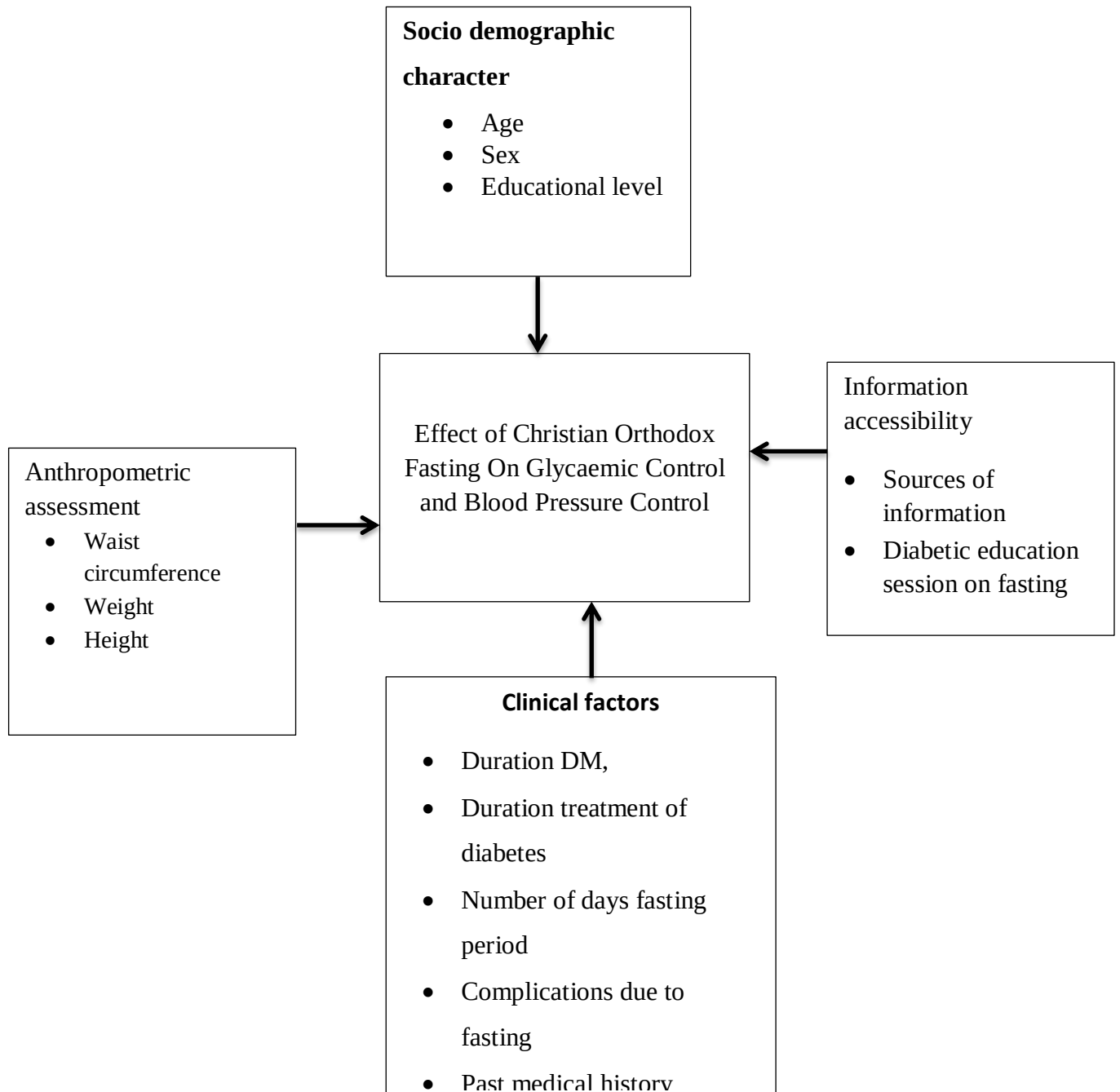


Figure 1: Effect of Christian Orthodox Fasting On Glycemic Control and Blood Pressure Control, 2024(10,37).

3. Objectives

3.1 General objective

To assess the effect of Christian Orthodox fasting on glycemic control and blood pressure regulation among type 2 diabetic patients in Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, in 2024.

3.2 Specific objectives

- Determine the Effect of Christian Orthodox fasting on glycemic control among type 2 diabetic patients in Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, in 2024.
- Determine the Effect of Christian Orthodox fasting on blood pressure control among type 2 diabetic patients in Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, in 2024.

4. Methods

4.1 Study area and period

The study was conducted in Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia. Addis Ababa is the capital city of Ethiopia, and according to the 2007 national census, the city has a total population of 6.6 million. Addis Ababa consists of a population of 3384,569 as per the 2007 population enumeration, with a yearly growth rate of 3.8%. This number, which has been expanded from the initially published 2,738,248 figure, gives off the impression of being to a greater extent underestimated (38,39). The School of Medicine in Addis Ababa has been a key institution for medical training since 1972. The hospital, which was the largest referral hospital in Ethiopia, was transferred to the School in 1998 and has since become a university teaching hospital. It is the main teaching hospital for clinical and preclinical training of most disciplines and offers specialized clinical services not available in other public or private institutions. Besides other services, chronic care for diabetic patients is one of the clinics that provide services to patients at these hospitals. The research was conducted from August 7 to August 22, 2024.

4.2 Study design

An observational longitudinal study was used

Pre-post study design: Each participant serves as their control, with measurements taken before fasting (baseline) and after fasting (follow-up).

4.3 populations

4.3.1 Source population

All Christian orthodox diabetic patients who have follow-ups at outpatient clinics at Tikur Anbessa Specialized Hospital.

4.3.2 Study population

All Christian orthodox diabetic patients who were fasting for Assumption Christian fasting, volunteered to participate in the study and attending the out patient clinic at Tikur Anbessa Specialized Hospital, during the data collection period.

4.4 Eligibility

• Inclusion Criteria:

- Adults (≥ 18 years) diagnosed with type 2 diabetes mellitus (T2DM).
- Christian Orthodox believers who were fasting for Assumption fast .
- Willingness to participate and provide informed consent.

• Exclusion Criteria:

- Type 2 DM patients those who use insulin for treatment
- Type 1 DM patient or other secondary causes of diabetes
- Patients with severe complications (*e.g* diabetic ketoacidosis, end-stage renal disease).
- Pregnant or lactating women.
- Christian Orthodox believers who were not fasting for Assumption fast .
- Patients are on medications that significantly alter blood glucose or blood pressure (*e.g.*, steroids).

4.5 Sample Size Determination

A total of 70 participants were recruited from the outpatient diabetes clinic at Tikur Anbessa Specialized Hospital.

4.6 Sampling techniques and procedure

This study employed a convenience sampling technique to recruit participants from the Tikur Anbessa Specialized Hospital (TASH) Diabetes Clinic. Convenience sampling was chosen for its practicality and accessibility, allowing for the inclusion of type 2 diabetic patients who regularly visited the clinic and adhered to Christian Orthodox fasting.

Before the fasting period, patients attending the TASH diabetes Clinic for routine follow-up were approached and informed about the study. Eligible participants were selected based on predefined inclusion and exclusion criteria. Those who agreed to participate provided written informed consent before enrolment. To assess changes in glycaemic control and blood pressure regulation, participants underwent three sequential measurements, with two measurements conducted during the fasting period and one before fasting began. The measurements were as follows: Pre-fasting (Baseline) prior to initiation of fasting period, mid-fasting after one week of continuous fasting and Post-fasting at the end of the fasting period

(after 15 days). At each time point, fasting blood glucose (FBS) and blood pressure (BP) were determined. These measurements were conducted either at the clinic or at home, depending on what was most convenient for the participants.

4.7 study variables

4.7.1 Dependent variables

FBS glucose and BP level

4.7.2 Independent variables

Socio-demographic variables

- Age
- Sex
- educational level
- Occupation

Clinical factors

- Duration DM
- Duration treatment of diabetes
- Number of days fasting period
- Complications due to fasting
- Past medical history

4.8. Data Collection Tool and Procedure

The data for the study was collected using a standard data collection tool, which was adapted from various sources of literature. Sociodemographic, clinical, and laboratory variables were gathered through interviews conducted by trained data collectors and from the patient's medical records. BP was measured in the participant's right arm while they were seated and rested for at least five minutes to ensure accurate readings. FBS glucose levels were determined after the participant had fasted for approximately ≥ 12 hours. The blood glucose was measured using a glucometer, with a sample of capillary blood obtained through a fingerstick.

4.9 Operational definitions

According to the 2024 guideline recommendation of the American Diabetic Association (ADA), achieving good glycemic control refers to a diabetic patient whose FBS glucose level falls within the range of 80-130 mg/dL. On the other hand, patients with a FBS glucose level exceeding 130 mg/dl are considered to have poor glycemic control (42).

Elevated BP is described as having a systolic blood pressure ranging from 120 to 129 mmHg and a diastolic blood pressure below 80 mmHg. Hypertension, on the other hand, is defined as having a systolic blood pressure of 130 mmHg or higher or a diastolic blood pressure of 80 mmHg or higher (42).

4.10 Data management and analysis

Once the data had been collected and checked for completeness and accuracy, it was sorted, categorized, and summarized. The quantitative data was entered by using EPI info version 7, the data was analyzed using SPSS software version 26, using exploratory analytics and descriptive statistics. Descriptive statistics were displayed using percentages, and frequency distribution tables. A paired t-test was performed to examine the significance of variations in means between two sets of data (before and after fasting). A p-value < 0.05 was considered statistically significant.

4.11. Data quality assurance

The data collectors were trained for half a day on principles, ethical considerations, procedures of data collection, how data was collected, and details of the questionnaire. The principal investigators were closely monitoring the data collection process. During data collection, the investigator and the supervisors will closely follow the data collection process to ensure its completeness. The questionnaire is being prepared in English and then translated into Amharic.

4.12. Ethical Consideration

Before the actual data collection, the proposal was presented to the Addis Ababa University and then an ethical clearance letter was obtained from the Addis Ababa University. Informed verbal consent was obtained from each participant before an interview and measurement were conducted. The participants' rights to refuse or withdraw from participating in the study and confidentiality issues were considered.

4.13. Plan for Dissemination the Result

The final results of this study will be submitted to the Addis Ababa University Department of Internal Medicine TASH, Endocrinology Department, and other appropriate institutions of higher education. It will be presented and also published in international or local research journals to make it accessible for peer review.

5. Result

5.1 Socio-demographic characteristics

A total of 68 participants were included in the study, with a 97.14% response rate; 36 were male and 32 were female. The mean age of respondents was 58.26 years (± 9.979 SD). Among the participants, 34 (50.0%) were between the ages of 46 and 60. Nearly two-thirds of the participants were married. Regarding educational level among the total participants, 16 (23.5%), 19 (27.9%), and 15 (22.1%) had a primary educational level, a secondary education level, and college and above education level, respectively. About 33 (48.5%) of the participants had information on importance of fasting for health (**Table 1**).

Table 1: Socio-demographic characteristics of type 2 diabetic patients at TASH, 2024(n=68).

Variables		Frequency	Percentage
Age groups(year)	37-45 years	7	10.3
	46-60 years	34	50.0
	above 60 years	27	39.7
Sex	Male	36	52.9
	Female	32	47.1
Marital status	Single	6	8.8
	Married	42	61.8
	Divorced	10	14.7
	Windowed	10	14.7
Educational status	Unable to read and Write	9	13.2
	Able to read and Write	9	13.2
	Primary Education	16	23.5
	Secondary Education	19	27.9
	College and Above	15	22.1
Source of information	Medias	14	20.6
	Health professionals	5	7.4
	Friends and relatives	3	4.4
	Other sources	11	16.2

5.2 Clinical information of the participants

More than half of the participants, 35 (51.5%), had less than five years of duration after being diagnosed with DM, and 44 (64.7%) of participants had less than five years of duration of treatment. About 49 (72.1%) of participants did not interrupt fasting during the fasting period previously. Those who interrupted their fasting reported that medication and fasting-related complications, such as hypoglycemia and Fatigue, were the reasons for stopping fasting during the fasting period. About 57 (83.8%) of participants had no complications due to fasting. More than three-fourths of the participants had comorbidity (**Table 2**).

Table 2: Diabetic-related Clinical information of diabetic patients at TASH, 2024(n=68).

Variable		Frequency(n)	Percentage (%)
Duration of DM	less than 5 years	35	51.5
	5-10 years	24	35.3
	greater than 10 years	9	13.2
Duration of treatment	Less than 5 years	44	64.7
	5 to 10 years	16	23.5
	Above 10 years	8	11.8
Reasons for discontinuing fasting during previous fasting period	Medication	4	5.9
	Fear of Hypoglycemia	5	7.4
	Fatigue	6	8.8
	Others reason	4	5.9
Complication of fasting	Hypoglycemia	7	10.3
	Fatigue	4	5.9
Comorbidities	Hypertension	38	55.9
	ischemic heart diseases	4	5.9
	Asthma	5	7.4
	other medical illness	7	10.3
Diabetes complication	CVS and PAD	14	20.6
	Diabetic neuropathy	10	14.7
	Diabetic retinopathy	2	2.9
	Others	12	17.6

5.3 Blood glucose monitoring

A paired t-test revealed a statistically significant reduction in fasting blood glucose (FBS) levels following the fasting period (mean difference = 19.56 mg/dL, $p = 0.001$). The mean FBS level decreased from 122.56 mg/dL before fasting to 103.01 mg/dL after fasting, reflecting an absolute mean difference of 19.56 mg/dL (figure 2). Additionally, the percentage of participants within the target range of controlled glycaemic levels (80–130

mg/dL) improved significantly, increasing from 67.6% to 91.2%, with an absolute improvement of 23.6% (91.2%–67.6%).

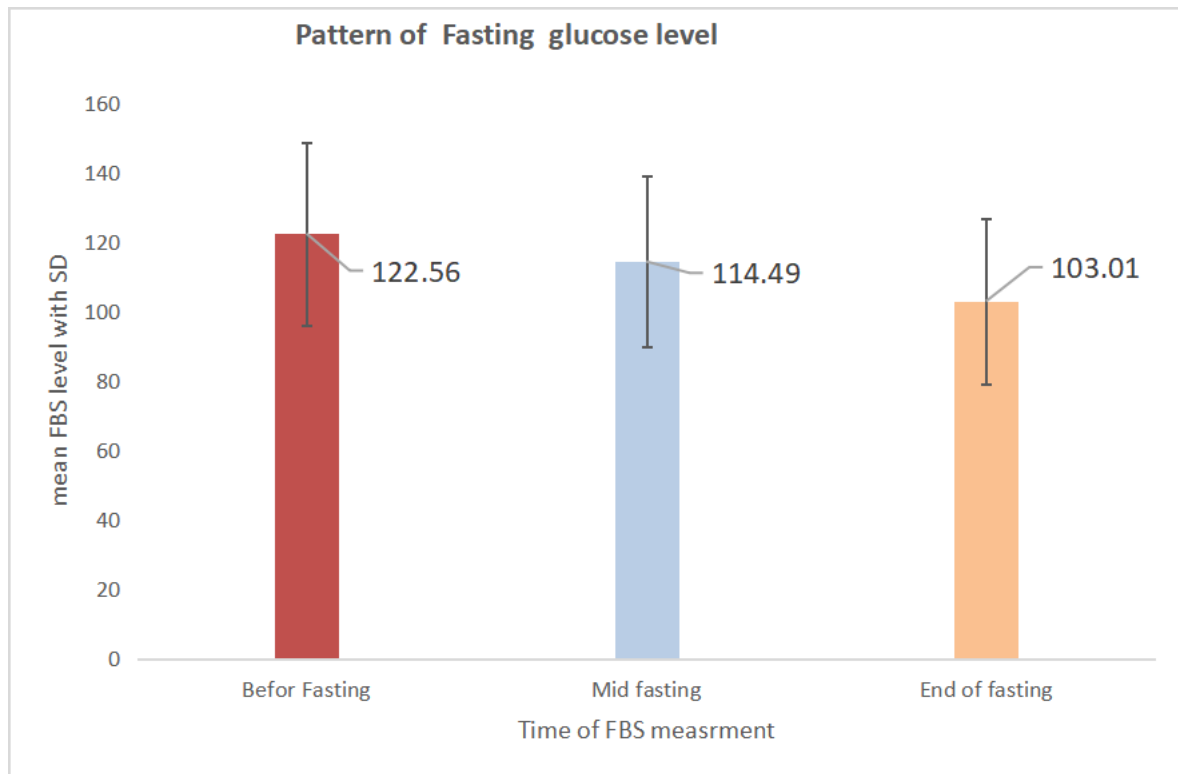


Figure 2. Trends in mean FBS before fasting, mid-fasting, and at the end of fasting among patients with type 2 diabetes at TASH, 2024.

5.4. BP level before and after fasting

A paired t-test demonstrated a statistically significant reduction in systolic blood pressure (SBP) following the fasting period (mean difference = 9.19 mmHg, $p = 0.001$). The mean SBP decreased from 137.6 mmHg before fasting to 128.41 mmHg after fasting, corresponding to an absolute mean reduction of 9.19 mmHg (Figure 3). Additionally, the proportion of patients with SBP >130 mmHg declined from 61.8% before fasting to 42.6% after fasting, resulting in an absolute percentage reduction of 19.2%.

Similarly, diastolic blood pressure (DBP) also showed a significant reduction following the fasting period (mean difference = 9.44 mmHg, $p = 0.001$). The mean DBP decreased from 80 mmHg before fasting to 70.56 mmHg after fasting, corresponding to an absolute mean reduction of 9.44 mmHg (Figure 2). Furthermore, the proportion of patients with DBP >80

mmHg decreased from 47.1% before fasting to 8.8% after fasting, leading to an absolute percentage reduction of 38.3%.

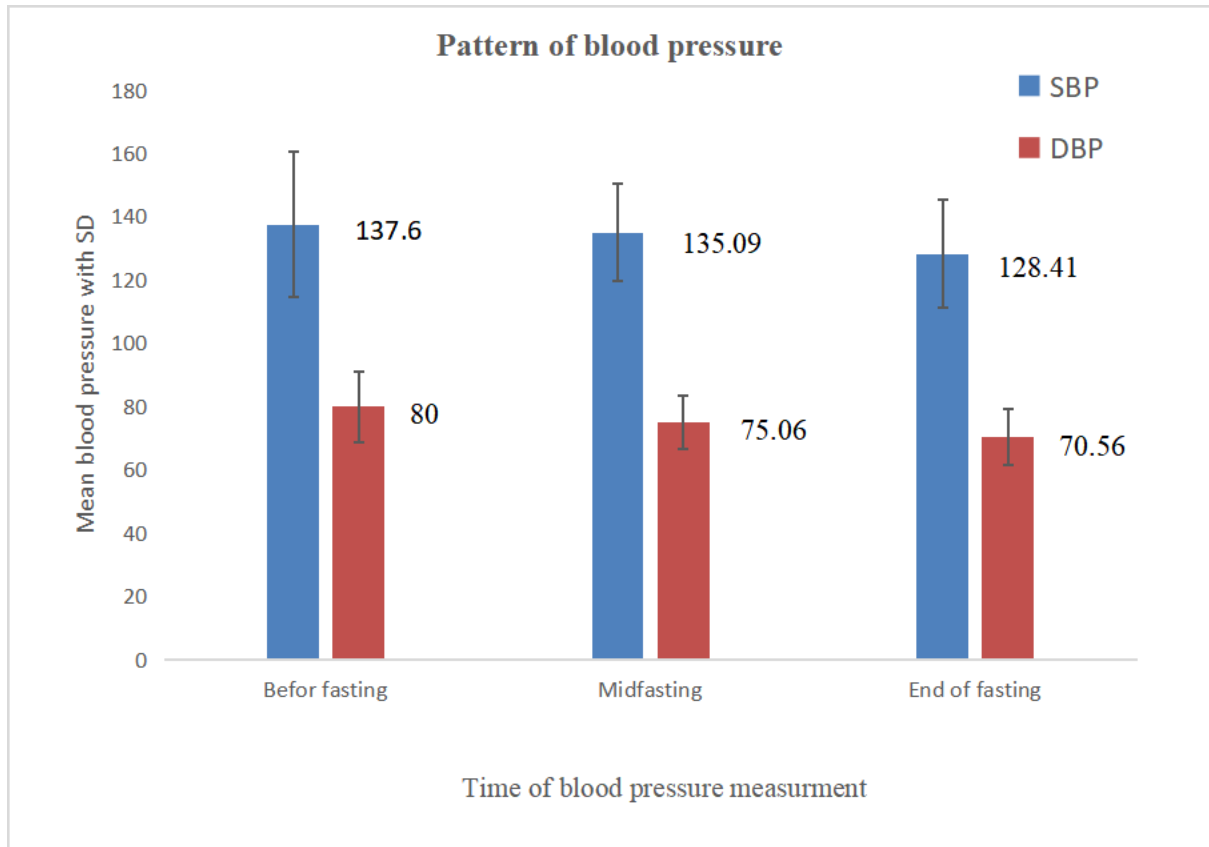


Figure 3: Changes in Mean Systolic and DBP in pre- post fasting in Patients with type 2 diabetes at TASH, 2024

6. Discussion

This study aimed to assess the impact of fasting on glycemic control and BP management in patients with type 2 diabetes at TASH. The findings demonstrated significant improvements in both glycemic and BP outcomes. FBS glucose levels decreased, with a substantial increase in the proportion of participants achieving target glycemic control. Additionally, both systolic and DBP showed marked reductions.

The study findings indicate that patients with diabetes who fasted experienced improved glycemic control, with the proportion of individuals having elevated blood glucose levels decreasing from 32.4% to 8.8% after fasting. This result is supported by studies conducted in Middle Eastern and Asian populations, which found that fasting significantly reduced HbA1c and FBS glucose levels (34). A study from Hawassa University in Ethiopia further supports this finding, showing a decline in FBS glucose levels in the final week of fasting compared to baseline measurements, with FBS glucose decreasing from 96.1% to 76.9% (36). On the contrary, different studies were reported that there was no significant reduction was detected in FBG after fasting compared to before fasting in diabetic patients. A study among Egyptian Coptic Orthodox Christians demonstrated a change in fasting serum glucose levels (43), while two other studies reported no significant changes in fasting serum glucose levels among Greek Orthodox Christian monks when comparing fasting and non-fasting weeks (44-45). These differences could be attributed to the changes in the pattern and duration of fasting in the religion. Other factors, such as amount or type of the food and decreased physical activities during fast, also could modulate metabolic effects of religious fasting.

The study also found that patients with diabetes who fasted exhibited better BP control, with reductions observed in both systolic and DBP. The proportion of patients with elevated SBP decreased from 61.8% to 42.6%, while those with elevated DBP declined from 47.1% to 8.8%. These findings are consistent a study in Egyptian Coptic Orthodox Christians demonstrated fasting had favorable outcome is reduction of SBP and DBP among diabetic patients (43). However, a study conducted at the Diabetic clinic of Shariati Hospital in Tehran,Iran showed that blood pressure did not change during Ramadan fasting among Type 2 diabetic Muslim patients (46).

Several studies have examined the isolated effects of fasting on either systolic blood pressure (SBP) or diastolic blood pressure (DBP), with findings varying by population and fasting tradition. A study conducted at Hawassa University in Ethiopia demonstrated that Ethiopian

Orthodox Christian Lenten fasting was significantly associated with a reduction in SBP, while DBP remained unaffected (36). In contrast, Sarri et al., studying Greek Orthodox Christian fasting, reported no significant difference in SBP between fasters and non-fasters, indicating that the effect of fasting on SBP may not be consistent across different religious or cultural fasting practices (47). Furthermore, Papadakos et al. found an opposite trend during Greek Orthodox fasting periods, reporting an increase in SBP among fasters, while DBP remained unchanged (45). Variables such as levels of physical activity, emotional stress, sleep patterns, and adherence to dietary restrictions during fasting periods can all affect blood pressure independently. While fasting may contribute to blood pressure modulation, its effect cannot be isolated from the broader lifestyle and psychosocial context in which it occurs.

7. Strength and limitations

The study assessed both glycaemic control (FBS) and BP (SBP/DBP) longitudinally, addressing two key aspects of diabetes management. Given the strong clinical link between diabetes and hypertension, conditions that frequently coexist and elevate cardiovascular risk, this comprehensive approach provides a more holistic understanding of fasting's impact on metabolic and hemodynamic stability in diabetic patients. These findings hold significant clinical relevance, offering valuable insights for healthcare providers in managing diabetes during fasting periods.

The study has some limitations that should be considered. First, the small sample size limits the generalizability of the findings to broader diabetic populations, particularly those from diverse geographic or socioeconomic backgrounds. Additionally, the majority of participants had a relatively short duration of diabetes (less than five years in 51.5%), which may have led to a greater responsiveness to fasting compared to individuals with long-standing diabetes. Additionally, the short follow-up period prevents the assessment of long-term sustainability and potential risks associated with fasting.

8. Conclusions and recommendations

This study demonstrates that structured fasting can significantly improve both glycemic control (mean FBS reduction: 19.56 mg/dL, $p=0.001$) and BP management (mean SBP/DBP reductions: 9.19/9.44 mmHg, $p=0.001$) in type 2 diabetic patients, particularly those with shorter disease duration (<5 years). The dual focus on metabolic and cardiovascular outcomes highlights fasting's potential as a holistic intervention. Based on the findings the following were recommended. Integrate christian fasting, Assumption, into diabetes management

guidelines emphasizing concurrent tracking of glycemic and BP outcomes. However, the clinical guidelines must adopt evidence-based targets (*e.g.*, FBS 80–130 mg/dL, BP <130/80 mmHg) and stepwise fasting plans, including pre-fasting health assessments and mid-fasting check-ins to address complications like hypoglycemia or fatigue. Research priorities must address study limitations through multicenter trials with larger, diverse cohorts and non-fasting control groups to isolate fasting-specific effects. Longitudinal studies are needed to assess the long-term sustainability of both the potential benefits and associated risks of fasting particularly in individual with chronic condition such as diabetes mellitus.

Reference

1. El-Sayed AEA, Noreldin A, Elsamman M, Zaky D, Kaldas E. Impact of Christians fasting in type 2 diabetic patients among Egyptian Coptic Orthodox. *J Diabetol*. 2018;9(3):88.
2. Sarri KO, Tzanakis NE, Linardakis MK, Mamalakis GD, Kafatos AG. Effects of Greek Orthodox Christian church fasting on serum lipids and obesity. *BMC Public Health*. 2003;3:1–8.
3. Karras SN, Koufakis T, Adamidou L, Antonopoulou V, Karalazou P, Thisiadou K, et al. Effects of OF versus combined energy and time-restricted eating on body weight, lipid concentrations, and glycaemic profile. *Int J Food Sci Nutr* [Internet]. 2021;72(1):82–92. Available from: <https://doi.org/10.1080/09637486.2020.1760218>.
4. Mansy W, Wajid S, Alwhaibi A, Alghadeer SM, Alhossan A, Babelghaith S, et al. Assessing Outpatients' Knowledge, Attitude, and Practice Toward Managing Diabetes in Saudi Arabia. *Inq (United States)*. 2022;59.
5. Mercy. *A Guide to Understanding Diabetes Self-Management*. 2018;
6. Bommer C, Sagalova V, Heesemann E, Manne-Goehler J, Atun R, Bärnighausen T, et al. Global Economic Burden of Diabetes in Adults: Projections From 2015 to 2030. *Diabetes Care*. 2018;41(5):963–70.
7. Waris N, Butt A, Askari S, Fawwad A, Basit A. Diabetes and its complications; Knowledge, attitude, and practices (KAP) and their determinants in Pakistani people with type 2 diabetes. *J Diabetol*. 2021;12(3):293.
8. Al Sifri S, Rizvi K. Filling the Knowledge Gap in Diabetes Management During Ramadan: the Evolving Role of Trial Evidence. *Diabetes Ther*. 2016;7(2):221–40.
9. Koufakis T, Karras SN, Zebekakis P, Kotsa K. Orthodox religious fasting as medical nutrition therapy for dyslipidemia: Where do we stand and how far can we go? *Eur J Clin Nutr* [Internet]. 2018;72(4):474–9. Available from: <http://dx.doi.org/10.1038/s41430-018-0113-2>
10. Lomboro A, Id D, Edosa ZK, Mitiku AA. Glycemic control and diabetes complications among adult type 2 diabetic patients at public hospitals in Hadiya zone, Southern Ethiopia. 2023;(Dm):1–14. Available from: <http://dx.doi.org/10.1371/journal.pone.0282962>
11. Atlas IDFD. International Diabetes Federation. Vol. 266, *The Lancet*. 1955. 134–137 p.
12. Cosentino F, Grant PJ, Aboyans V, Bailey CJ, Ceriello A, Delgado V, et al. 2019 ESC Guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with the EASD. *Eur Heart J*. 2020;41(2):255–323.
13. Gautam A, Bhatta DN, Aryal RU. Diabetes related health knowledge, attitude and practice among diabetic patients in Nepal. *BMC Endocr Disord*. 2015;15(1):1–8.
14. Gordon Singh S, Aiken J. The effect of health literacy level on health outcomes in patients with diabetes at a type v health center in Western Jamaica. *Int J Nurs Sci*

- [Internet]. 2017;4(3):266–70. Available from: <http://dx.doi.org/10.1016/j.ijnss.2017.06.004>
15. Khurshid T. Knowledge and practice about diabetes among adult diabetic patients in Erbil, Iraq. *Zanco J Med Sci*. 2014;18(1):659–66.
 16. Hiremath L, Hiremath D. Noncommunicable Diseases. *Essentials Community Med A Pract Approach*. 2012;76–76.
 17. Koufakis T, Karras S, Antonopoulou V, Angeloudi E, Zebekakis P, Kotsa K. Effects of Orthodox religious fasting on human health: a systematic review. *Eur J Nutr*. 2017;56(8):2439–55.
 18. Amirudin N, Mohamed Aiman SN, Kassim R, Panting AJ. The Importance of Health Information Seeking Among Diabetes Patients in Malaysia: A Preliminary Observation. *Malaysian J Soc Sci Humanit*. 2021;6(12):205–12.
 19. Saeedi P, Petersohn I, Salpea P, Malanda B, Karuranga S, Unwin N, et al. Global and regional diabetes prevalence estimates for 2019 and projections for 2030 and 2045: Results from the International Diabetes Federation Diabetes Atlas, 9th edition. *Diabetes Res Clin Pract* [Internet]. 2019;157:107843. Available from: <https://doi.org/10.1016/j.diabres.2019.107843>
 20. Rafique G, Shaikh F. Identifying needs and barriers to diabetes education in patients with diabetes. *J Pak Med Assoc*. 2006;56(8):347–52.
 21. Kassahun T, Gesesew H, Mwanri L, Eshetie T. Diabetes related knowledge, self-care behaviours and adherence to medications among diabetic patients in Southwest Ethiopia: A cross-sectional survey. *BMC Endocr Disord* [Internet]. 2016;16(1):1–11. Available from: <http://dx.doi.org/10.1186/s12902-016-0114-x>
 22. Wolde M, Berhe N, Van Die I, Medhin G, Tsegaye A. Knowledge and practice on prevention of diabetes mellitus among Diabetes mellitus family members, in suburban cities in Ethiopia. *BMC Res Notes*. 2017;10(1):1–6.
 23. Asmelash D, Abdu N, Tefera S, Baynes HW, Derbew C. Knowledge, Attitude, and Practice toward Glycemic Control and Its Associated Factors among Diabetes Mellitus Patients. *J Diabetes Res*. 2019;2019:1–10.
 24. Xu XY, Leung AYM, Chau PH. Health Literacy, Self-Efficacy, and Associated Factors Among Patients with Diabetes. *HLRP Heal Lit Res Pract*. 2018;2(2):67–77.
 25. Almansour HA, Chaar B, Saini B. Perspectives and experiences of patients with type 2 diabetes observing the Ramadan fast. *Ethn Heal* [Internet]. 2018;23(4):380–96. Available from: <http://dx.doi.org/10.1080/13557858.2016.1269156>
 26. Lin B, Liu X, Yao S, Pan Z. Intensive BP Control and Diabetes Mellitus Incidence for Patients with Impaired Fasting Glucose: A Secondary Analysis of SPRINT. *Int J Hypertens*. 2023;2023.
 27. Alhassan Y, Kwakye AO, Dwomoh AK, Baah-Nyarkoh E, Ganu VJ, Appiah B, et al. Determinants of BP and blood glucose control in patients with co-morbid hypertension and type 2 diabetes mellitus in Ghana: A hospital-based cross-sectional study. *PLOS*

- Glob Public Heal [Internet]. 2022;2(12):1–17. Available from: <http://dx.doi.org/10.1371/journal.pgph.0001342>
28. Xu L, Wen X, Yang Y, Cui D. Trends and Comparisons of BP and Fasting Plasma Glucose in Patients with Hypertension, Diabetes, and Comorbidity: 4-Year Follow-Up Data. *Risk Manag Healthc Policy*. 2022;15(November):2221–32.
 29. Shimels T, Abebaw M, Bilal AI, Tesfaye T. Treatment Pattern and Factors Associated with BP and Fasting Plasma Glucose Control among Patients with type 2 diabetes Mellitus in Police Referral Hospital in Ethiopia. *Ethiop J Health Sci*. 2018;28(4):461–72.
 30. University JH. Nine Ways to Avoid diabetes Complications. *Diabetes Educ*. 28:3–4.
 31. Kotwas A, Karakiewicz B, Zabielska P, Wieder-Huszla S, Jurczak A. Epidemiological factors for type 2 diabetes mellitus: evidence from the Global Burden of Disease. *Arch Public Heal*. 2021;79(1):1–7.
 32. Chan M. Global Report on Diabetes. Isbn [Internet]. 2016;978(April):6–86. Available from: <https://www.who.int/publications/i/item/9789241565257>
 33. Koley M, Saha S, Arya JS, Choubey G, Ghosh S, Chattopadhyay R, et al. Knowledge, Attitude, and Practice Related to Diabetes Mellitus Among Diabetics and Nondiabetics Visiting Homeopathic Hospitals in West Bengal, India. *J Evidence-Based Complement Altern Med*. 2016;21(1):39–47.
 34. Elmajnoun HK, Faris MAIE, Abdelrahim DN, Haris PI, Abu-Median AB. Effects of Ramadan Fasting on Glycaemic Control Among Patients with type 2 diabetes: Systematic Review and Meta-analysis of Observational Studies. *Diabetes Ther* [Internet]. 2023;14(3):479–96. Available from: <https://doi.org/10.1007/s13300-022-01363-4>
 35. Gholampoor N, Sharif AH, Mellor D. The effect of observing religious or faith-based fasting on cardiovascular disease risk factors: A systematic review and meta-analysis. *Nutr Metab Cardiovasc Dis* [Internet]. 2024;34(5):1097–109. Available from: <https://doi.org/10.1016/j.numecd.2024.02.002>
 36. A. M. Metabolic Effect of Orthodox Fasting Dietary Pattern in Type 2 Diabetic Patients. 2022;7(3).
 37. Abera RG, Demesse ES, Boko WD. Evaluation of glycemic control and related factors among outpatients with type 2 diabetes at TASH, Addis Ababa, Ethiopia: a cross-sectional study. *BMC Endocr Disord* [Internet]. 2022;22(1):1–11. Available from: <https://doi.org/10.1186/s12902-022-00974-z>
 38. Shiferraw M. City Profile: Addis Ababa. *World Lit Today*. 2022;96(3):5.
 39. ADDIS ABABA CITY Main area of return Addis Ababa. 2019;(1110):1–7.
 40. Lorenzo-Medina M, De-La-Iglesia S, Roperio P, Nogueira-Salgueiro P, González-Fernández FA. Interference of Hemoglobin (Hb) on Measurement of HbA1c Using an HPLC Method. *J Diabetes Sci Technol*. 2021;15(4):974–5.
 41. Michael A, Baye K. Ethiopian Orthodox fasting is associated with weight reduction

- and body composition changes among healthy adults: a prospective cohort study. *Sci Rep* [Internet]. 2023;13(1):1–7. Available from: <https://doi.org/10.1038/s41598-023-35060-4>
42. American Diabetic Association. 2024 GPC ADA standards of Medical Care in DM. 2024
 43. Elktuni A, Almusbahe B, Essamei H, Alturki S, Elshwekh HH. Effects of Fasting Ramadan on Glycaemic Control and Lipid Profile in Patients with Type 2 Diabetes. *Libyan Journal of Medical Research*. 2021 Jun 30;15(1):111-23.
 44. Sarri KO, Tzanakis NE, Linardakis MK, Mamalakis GD, Kafatos AG. Effects of Greek orthodox Christian church fasting on serum lipids and obesity. *BMC Public Health* 2003;3:16.
 45. Papadaki A, Vardavas C, Hatzis C, Kafatos A. Calcium, nutrient and food intake of Greek orthodox Christian monks during a fasting and non-fasting week. *Public Health Nutr* 2008;11:1022-9
 46. Yarahmadi Sh, Larijani B, Bastanhagh MH, Pajouhi M, Baradar Jalili R, Zahedi F, et al. Metabolic and clinical effects of Ramadan fasting in patients with type II diabetes. *J Coll Physicians Surg Pak* 2003;13:329-32.
 47. Sarri K, Linardakis M, Codrington C, Kafatos A. Does the periodic vegetarianism of Greek orthodox Christians benefit blood pressure? *Prev Med* 2007;44:341-8.

Annexes one

Informed consent

Hello! How are you doing? Hello, my name is _____. I am here on behalf of Addis Ababa University to gather information about the effect of Christian orthodox fasting on glycaemic control and BP control among type 2 diabetic patients in TASH, Addis Ababa, Ethiopia, 2024. The findings of this study will aid in the development of a program for intervention and implementation in this area to fill gaps. So, this is a questionnaire designed to assess the effect of Christian orthodox fasting on glycaemic control and BP control among type 2 diabetic patients in TASH, Addis Ababa, Ethiopia, 2024. The correct information you supply me, along with the information we gather from other participants, will be extremely important in the research. I guarantee you that your name and other identifiers of your status will not be documented in the questionnaire and that any information you supply me will be kept strictly confidential. I would like to inform you that you can refuse to respond to questions in which you are not interested and also stop participating in the study at any time in the process.

Participant agreed. Yes ☐

No ☐

If you are not agreed thank you.

Interviewer signature _____ Date ____/____/____

Questioners code _____

Thank you for your participation!!!

Questioners

Part one: Socio-demographic characteristics

No	Questions	Alternative
----	-----------	-------------

101	What is your age?	_____years
102	Sex	1. male 2. female
103	What is your marital status?	1. Single 2. Married 3. Divorced 4. Widowed
104	What is your Educational level?	1. Unable to read and write 2. Able to read and write 3. Primary education 4. Secondary education 5. College and above
105	Do you have information on the importance of health?	1. Yes 2. No
106	If yes what is your source of information?	1. Medias 2. Health care workers 3. Friends/relatives 4. Others (teachers, religious leaders...)
107	Do you have social support?	1. Yes 2. No

Part two: clinical information of the participants

No	Questions	Response
201	How long has it been since you were diagnosed with DM?	_____ years and months
202	How long has it been since you started the treatment?	_____ years and months
203	Do you fast always	1. yes 2. No
204	If you have previously discontinued fasting, what were the reasons that led to your decision to stop fasting?	_____ _____ _____
205	Number of days fasting period	_____ days
206	Do you have complications due to fasting	1. yes 2. No
207	Do you have comorbidity?	1. .yes 2. No
208	Is there any complication related to DM?	1. Yes 2. No, if no skip to question no 210
209	If yes what kind of complication	1. Heart disease 2. Diabetic foot ulcer 3. Kidney disease 4. Nerve disease 5. Eye disease 6. Stroke Other specify
210	FBS Sugar level (mg/dl)	Day 1_____
		Day 7_____
		Day 15_____
211	BP level (mmHg)	Day 1_____
		Day 7_____
		Day 15_____

thank you for your participation!!!

አባሪ አንድ

በመረጃ የተደገፈ ስምምነት

አንደምነህ፣ አንደምነሽ፣ ጤና ይስጥልኝ ስሜ _____ እባላለሁ በጥቁር አንበሳ ስቴሻላይዝድ ሆስፒታል፣ አዲስ አበባ፣ ኢትዮጵያ በ2024 በዓይነት 2 የስኳር ህመምተኛ መካከል የክርስትና ኦርቶዶክስ ጾም የሥኳር መጠን ቁጥጥር እና የደም ግፊት ቁጥጥር ላይ ስለሚያስከትለው ውጤት መረጃ ለመሰብሰብ አዲስ አበባ ዩኒቨርሲቲን ወክሎ መጥቻለሁ። የዚህ ጥናት ግኝቶች ክፍተቶችን ለመሙላት በዚህ ረገድ ጣልቃ ገብነትና ተግባራዊ የሚሆን ፕሮግራም እንዲዳብር ያግዛሉ። ስለዚህ ይህ በጥቁር አንበሳ ስቴሻላይዝድ ሆስፒታል፣ አዲስ አበባ፣ ኢትዮጵያ፣ 2024 በዓይነት 2 የስኳር ህመምተኛ ላይ የክርስትና ኦርቶዶክስ ጾም የሥኳር መጠን ቁጥጥር እና የደም ግፊት ቁጥጥር ላይ የሚያሳድረውን ተፅዕኖ ለመገምገም የተዘጋጀ ጥያቄ ነው። የምታቀርቡኝ ትክክለኛ መረጃ ከሌሎች ተሳታፊዎች ከምናሰባስበው መረጃ ጋር በምርምሩ እጅግ በጣም አስፈላጊ ይሆናል። የእርስዎ ስም እና ሌሎች ሁኔታዎን መለያዎች በጥያቄው ውስጥ እንደማይመዘገቡ እና የምታቀርቡኝ ማንኛውም መረጃ በጥብቅ ምስጢራዊነት እንደሚጠበቅ ዋስትና እሰጣችኋለሁ። እርስዎ መልስ መስጠት ለማይፈልጉባቸው ጥያቄዎች ምላሽ ለመስጠት ፈቃደኛ አለመሆን እና በሂደቱ ውስጥ በማንኛውም ጊዜ ጥናት ላይ መሳተፍዎን ማቆም ይችላሉ።

ተሳታፊው ተስማምቷል አዎ ☐ አይ ☐

ካልተስማሙ አመሰግናለሁ።

የጠያቂ ፊርማ _____ ቀን _____ / _____ / _____

የጠያቂዎች ኮድ _____

ለተሳትፎዎ እናመሰግናለን!!!

መጠይቅ

ተ.ቁ	ጥያቄዎች	አማራጮች
101	እድሜሽ/ህ ስንት ነው?	_____ ዓመታት
102	ፆታ	1. ወንድ 2. ሴት
103	የጋብቻ ሁኔታዎ?	1.ያላገባ 2.ያገባ 3.የተፋታ 4.ባል የሞተባት/ሚስት የሞተበት
104	የትምህርት ደረጃዎ?	1.ማንበብ እና መጻፍ አለመቻል 2.ማንበብ እና መጻፍ የሚችል 3. የመጀመሪያ ደረጃ ትምህርት 4.የሁለተኛ ደረጃ ትምህርት 5. ኮሌጅ እና ከዚያ በላይ
105	ጾም ለጤና ያለው ጠቀሜታ ላይ መረጃ ሰምተዉ ያዉቃሉ?	1. አዎ 2. አይ
106	አዎ ከሆነ የመረጃ ምንጭህ ምንድን ነው?	1. ሚዲያዎች 2. የጤና አጠባበቅ ሠራተኞች 3. ጓደኞች / ዘመዶች 4. ሌሎች (መምህር፣ የሃይማኖት መሪ. ...)
107	የጓደኛ/የቤተሰብ ማህበራዊ ድጋፍ አለህ?	1.አዎ 2. አይ

ክፍል ሁለት: የተሳታፊዎች ክሊኒካዊ መረጃ

ተ.ቁ	ጥያቄዎች	አማራጮች
201	የስኳር ህመሙ ከታወቀ ምን ያህል ጊዜ ሆኖታል?	_____ ሳምታት እና ወራት _____
202	ሕክምናውን ከጀመርክ/ ሽ ምን ያህል ጊዜ ሆኖታል?	_____ ሳምታት እና ወራት _____
203	አዘውትረህ ትጸማለህ/ሽ	1. አዎ 2. አይ
204	ከጾም የሚከለክለው ምክንያት ምንድን ነው?	_____ _____ _____
205	የጾም ቀናት ብዛት	_____ _ ቀናት
206	በጾም ምክንያት ውስብስብ ችግሮች አጋጥሞዎታል?	1.አዎ 2. አይ
207	ተጓዳኝ ህምም አለህ/ሽ?	1. አዎ 2. አይ
208	በስኳር በሽታ የተነሳ የተዛመደ ህመም አለ?	1. አዎ 2.አይ

209	አዎ ከሆነ ምን አይነት ህመም ነው	1. የልብ ሕመም 2. የስኬረ በሽታ እግር ቁስለት 3. የኩላሊት በሽታ 4. የነርቭ በሽታ 5. የዓይን ሕመም 6. ስትሮክ 7. ሌላ ይግለጽ
210	የጾም የደም ስኬረ መጠን (mg/dl)	ቀን 1 _____
		ቀን 7 _____
		ቀን 15 _____
211	የደም ግፊት ደረጃ (mmHg) (mmHg)	ቀን 1 _____
		ቀን 7 _____
		ቀን 15 _____

ለተሳትፎዎ እናመሰግናለን!!!