

ARSI UNIVERSITY
COLLEGE OF HEALTH SCIENCES
DEPARTMENT OF INTERNAL MEDICINE



BARRIERS TO EFFECTIVE INSULIN THERAPY IN ADULT PATIENTS WITH POORLY CONTROLLED TYPE 1 DIABETES MELLITUS: A STUDY AT ASELLA REFERRAL AND TEACHING HOSPITAL, ARSI UNIVERSITY, ETHIOPIA (2025).

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A RESEARCH THESIS TO BE SUBMITTED TO THE DEPARTMENT OF INTERNAL MEDICINE, COLLEGE OF HEALTH SCIENCE ARSI UNIVERSITY, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE SPECIALITY CERTIFICATE IN INTERNAL MEDICINE.

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Table 1:Research Project Thesis Submisson Form

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Title of the research project	Assessing Barriers to Effective Insulin Therapy In Adult Patients With Poorly Controlled Type 1 Diabetes Mellitus On Follow up At Asella Referral and Teaching Hospital, Arsi University ,Asella ,Central Ethiopia .
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Acronym/Abbreviations

AU	Arsi University
ARTH	Asela Referral and Teaching Hospital
AHR	Adjusted hazard ratio
AOR	Adjusted odds ratio
BP	Blood pressure
CVD	Cardiovascular disease
CoHS	College of Health Sciences
Cm	Centimeter
T1DM	Type 1 Diabetes Mellitus
ETB	Ethiopian Birr
HDU	High Dependency Unit
IPAQ	International physical activity questionnaire
OR	Odds Ratio
PHQ9	Patient Health Questionnaire 9
SD	Standard deviation

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Abstract

Background: Poor glycemic control remains a major challenge in the management of diabetes mellitus and is associated with increased morbidity and mortality. This study aimed to assess the barriers to effective insulin therapy in adult patients with poorly controlled type 1 diabetes mellitus attending Asella Referral and Teaching Hospital, Ethiopia.

Objective: To assess the barriers that hinder effective insulin therapy in adult patients with poorly controlled T1DM attending the diabetic follow-up clinic at Asella Referral and Teaching Hospital, Asella, Ethiopia in 2025.

Methodology: A cross-sectional study was conducted among 273 type 1 adult diabetes patients on follow-up at ARTH. Data was collected by kobotool box and was entered using and analyzed by SPSS version 27. Descriptive statistics was carried out, and categorical variables were reported as frequencies and percentages whereas; median and interquartile range (IQR) was used for continuous variables. Binary logistic regression analysis was applied to identify barriers associated with poor glycemic control in adult patients with type 1 DM. P value < 0.25 in the bivariate logistic regression was fitted into the multivariable logistic regression analysis. The level of significance was declared at a p -value of < 0.05 .

Results: Out of 273 type 1 diabetes patients included in the study, 157 (57.5%) had poor glycemic control. The factors associated with poor glycemic control were depression (AOR = 2.92; 95% CI: 1.39–5.95.15; $p = 0.004$), lower monthly income (AOR=1.54;95% CI[1.30-2.96]; $p=0.049$), basal-only insulin regimens (AOR = 2.045;95%,CI :1.055-3.964; $p = 0.034$), and good adherence (AOR = 0.39; 95% CI: [0.16–0.97]; $p=0.04$).

Conclusion: The occurrence of poor glycemic control is high among adult patients with diabetes who visit ARTH. The results emphasize the view that ideal glycemic control must be an integrated methodology that covers mental health, socioeconomic issues, and compliance with therapy, in addition to clinical management

Key words: Type 1 diabetes mellitus, Glycemic control, ARTH, Ethiopia

CHAPTER 1: Introduction

1.1 Background

Diabetes is a disorder with a disturbance in metabolism marked by the presence of high blood sugar level due to insufficient insulin production or ineffective utilization of insulin by the body(1).Type 1 Diabetes Mellitus(T1DM) is a chronic autoimmune disorder characterized by the destruction of insulin-producing β -cells in the pancreas, leading to absolute insulin deficiency(2)(3). While effective insulin therapy helps in maintaining optimal glycemic levels with little risk of complications in the long run, control of diabetes in adult patients with T1DM is still a challenge, leaving it poorly controlled, which in turn increases the risk for multiple complications such as cardiovascular diseases, neurological disorders, kidney problems, and eye diseases(4).

Diabetes constitutes a chronic and resilient pathology that significantly challenges its management in the health environment. It requires very considerable lifestyle changes to improve its outcomes therapeutically (2).Management is complicated, but where patients have the right self-care knowledge and practice the right behaviors, they can achieve their desired glycemic targets(3)) (2). Many patients do not realize good glycemic control and therefore suffer continued negative health impacts (4)(11) Those with diabetes are at greater risk of morbidity and mortality(12). Besides, they stand to develop other chronic non-communicable diseases or even infectious conditions(12)(5).

As a result, it is necessary to apply and practice ongoing and routine quality care along with several risk-reduction strategies. The components mentioned above are fundamental in the process of risk mitigation: diabetes self-management education, medical nutrition therapy, psychosocial support, and self-care(2)(5)(12).

Diabetes self-care behaviors are healthy dietary practices, regular exercise, proper medication adherence, self-monitoring of blood glucose levels, and problem-solving skills to manage the disease situation as well as monitoring the disease condition progression and eye care (6)(7) .A promise to these habits can greatly lower the chance of problems and improve overall life quality. However, knowing this, diabetes care has not been done well, leading to poor blood sugar control. This makes it more likely for full diabetes issues to happen(7). So, the good part of

patients with health helpers (HCPs) is key for giving top-notch health aid. Such involvement helps build partnerships, eases shared choices, and gives patients power over their lifestyle goals and plans(5)(7).

On a global scale, in the year 2019, 9.3% (463 million) of individuals aged between 20 and 79 years were diagnosed with diabetes, with projections indicating a rise to 10.2% (578 million) by the year 2030; notably, over three-quarters (79.4%) of this population reside in low- and middle-income nations (5)(6). Moreover, statistical data suggest that approximately four million fatalities each year can be attributed to diabetes (1).

Ethiopia emerges as the fourth country in the uninterrupted pattern of diabetes cases among the ages of 20 to 79 years in the African continent, with an increasing incidence from 1.4 million in 2011 to 1.9 million in 2021 along with 1,105.9 individuals undiagnosed(2). The year 2021 had a per capita expenditure related to diabetes (\$104.3) for every individual aged 20to79 years, which is equivalent to \$17.92 per month. At Dessie Comprehensive Specialized Hospital (DCSH), direct medical costs accounted for 86.5% of total diabetic expenditures. Diabetes represents a chronic and challenging disease that creates a lot of difficulties in proper management. It demands a huge change in lifestyle for better outcomes(2)(8).

1.3 Statement of the problem

Diabetes mellitus (DM) is a chronic metabolic disease that poses a significant global health burden. In 2019, approximately 9.3% of the world's population aged 20 to 79 years equivalent to 463 million individuals were living with diabetes, and this number is projected to rise to 10.2% or 578 million by 2030 (9). Among the various types, type 1 diabetes mellitus (T1DM) requires lifelong insulin therapy to maintain glycemic control and prevent serious complications. Despite advancements in insulin treatments, achieving optimal glycemic control remains a major challenge, particularly in low-resource settings (9).

Ethiopia has experienced a substantial increase in the prevalence of diabetes, rising from 1.4 million cases in 2011 to 1.9 million, making it the fourth highest in Africa. Yet, only 43.5% of diabetic patients in the country achieve good glycemic control (HbA1c <7%), with T1DM patients being particularly vulnerable. Poor glycemic control in T1DM is associated with a higher risk of severe complications such as retinopathy, nephropathy, and cardiovascular disease, and contributes significantly to non-communicable disease mortality, which accounts for 12% of such deaths in Ethiopia (11).

Several barriers impede effective insulin therapy in Ethiopia. The cost of insulin and supplies, averaging \$17.92 per month, places a substantial financial burden on households, with 25% of families spending more than 10% of their income on diabetes care (12). Adherence to insulin regimens is also low; a study in Tigray reported that only 24.2% of adults with T1DM followed their prescribed insulin schedules due to factors such as cost, fear of injections, and inconsistent supply. Insulin stock-outs are common, affecting 40% of Ethiopian health facilities, and often force patients to skip doses, further compromising glycemic control (13).

While national studies have highlighted general barriers such as cost, adherence, and healthcare access, there is a lack of research quantifying these challenges specifically among adults with poorly controlled T1DM at Asella Referral and Teaching Hospital (ARTH). Patient-specific factors, including fear of hypoglycemia and depression, as well as systemic issues like insulin affordability and clinic accessibility, remain underexplored in this context (12).

Therefore, this study aims to assess the barriers that prevent effective insulin therapy among adults with poorly controlled T1DM at ARTH. By identifying these challenges, the research seeks to generate evidence-based recommendations to improve patient adherence, strengthen healthcare support, and optimize diabetes management strategies in Ethiopia

1.4 Significance of the study

This study aimed to assess the barriers of effective insulin therapy, along with its associated factors, among adult type1 diabetic patients attending attending diabetic clinic at Arsi referral and teaching hospital. The findings of the study will be beneficial to various stakeholders.

Specifically, the findings will help hospital managers and policymakers in developing and implementing an educational program focused on adherence to insulin therapy. This program will play a crucial role in reducing morbidity and mortality associated with poor glycemic control and its complication. Moreover, it will help adult patients with poorly controlled type 1 diabetes to better manage and prevent complication from poorly controlled Type 1 diabetes mellitus.

Furthermore, the findings of this study will inform the Arsi Zone Health office and Asella referral and teaching hospital hospitals about the current level of poorly controlled type 1 diabetes mellitus among adult type 1 diabetic patients attending Arsi referral and teaching hospital. Additionally, these findings can serve as a baseline for future research, providing valuable insights in to level of critical barriers in adult type 1 diabetic patients..

Moreover, the study's findings will aid federal and regional health bureau in developing mental health education in treatment of diabetic patients which to increase the level of adherence to insulin therapy.

CHAPTER 2: Literature Review

The chronic autoimmune disease known as type 1 diabetes mellitus (T1DM) is typified by the death of the pancreatic beta cells that produce insulin, which leaves the patient completely insulin deficient (6) (7). Although insulin therapy is the mainstay of managing type 1 diabetes, many adults still struggle to achieve optimal glycemic control. Chronic problems like retinopathy, nephropathy, and cardiovascular disease, as well as acute ones like diabetes ketoacidosis, can arise due to poor control of blood sugar levels. Inadequate control of glycemic levels remains a challenge due to shortcomings in therapeutic measures and even advances in glucose monitoring systems, insulin delivery systems, and teaching patients about their illness. Therefore, this review investigates the different psychological factors that, alongside the other documented socioeconomic, educational, and systemic obstacles, result in adults with poorly managed type 1 diabetes (6).

Psychological barriers

One of the biggest obstacles to successful insulin treatment is psychological. Commonly reported problems that can hinder adherence to insulin regimens include depression, anxiety, diabetes distress, and fear of hypoglycemia (7). The emotional strain of managing a chronic illness is known as diabetes distress. Poor glycemic control has been linked to high levels of diabetes distress, according to studies. Due to feelings of helplessness, frustration, or burnout, adult T1DM patients who experienced diabetes distress were less likely to stick to their insulin regimen (1).

Fear of hypoglycemia: Type 1 diabetics frequently have concerns regarding hypoglycemia. This anxiety often leads to insulin omission which, paradoxically, worsens the situation of hypoglycemia. One study revealed that, particularly for those with a past of more severe episodes, fear of hypoglycemia was greatly associated with suboptimal spatiotemporal control of blood sugar (2).

Depression and Anxiety: This condition of anxiety and depression tends to co-exist with other disorders amongst the diabetic population with type 1. These conditions tend to worsen the so-

called self-care neglect, like taking insulin. It was shown in a meta-analysis that being depressed increases the odds of inadequate control by one and a half times (3).

2.2.2 Socioeconomic Barriers: There is a clear relationship between one's economic standing and access and adherence to insulin therapy. Social factors such as available support, available finances, and even healthcare systems to some extent, greatly affect the outcomes of the patients (10).

Financial constraints: Many patients can use insulin but are not able to afford the needles, glucometers, and strips needed. According to a survey done in Nepal, most aides and nurses have and use insulin for patients' use, however, they do not have supplies they can afford. One of the patients stated that the exorbitant cost of these supplies hinders my ability to manage my diabetes properly (4).

Healthcare Access: Suboptimal care is a result of limited access to endocrinologists, diabetes educators, and cutting-edge diabetes technologies. These disparities disproportionately affect underserved communities and rural populations. According to an American Diabetes Association report, individuals who do not have regular access to specialized care are more likely to have poorly managed type 1 diabetes (5).

Social support: The difficulties of managing type 1 diabetes can be made worse by a lack of support from peers or family. Poorer health outcomes and reduced adherence to insulin therapy have been associated with social isolation. Patients with strong social support networks had better glycemic control than those without such support, according to a study conducted at Iran's Isfahan University (6).

2.2.3 Educational Barriers

Sufficient diabetes education is necessary for effective insulin administration. However knowledge gaps, false beliefs about insulin therapy, and poor patient-provider communication continue to be major challenges (13).

A) Knowledge Gaps: Many patients don't fully comprehend insulin adjustment techniques, carbohydrate counting, and insulin dosage. Knowledge gaps were found to be the main cause of insulin nonadherence in a study conducted by an online survey of 1250 doctors across seven nations (7).

B) Misconception About insulin: Some patients have false beliefs about insulin, such as the idea that it exacerbates the progression of diabetes or causes weight gain. Reluctance to start or

increase insulin therapy may result from these ideas. According to a study, improving insulin adherence by addressing these misconceptions through focused education (8).

C) Patient-provider communication:Effective insulin therapy may be hampered by inadequate communication between patients and medical professionals. Patients frequently feel intimidated by medical jargon or overwhelmed by intricate treatment plans. Vanderbilt University Medical Center in Nashville, USA, conducted a qualitative study that emphasized the value of empathic, transparent communication in building trust and improving adherence (9).

2.2.4 Healthcare System Barriers: Systemic issues within the healthcare infrastructure also pose challenges.

Healthcare provider Factors:Inadequate patient education and support may arise from healthcare professionals' ignorance of insulin therapy (19).

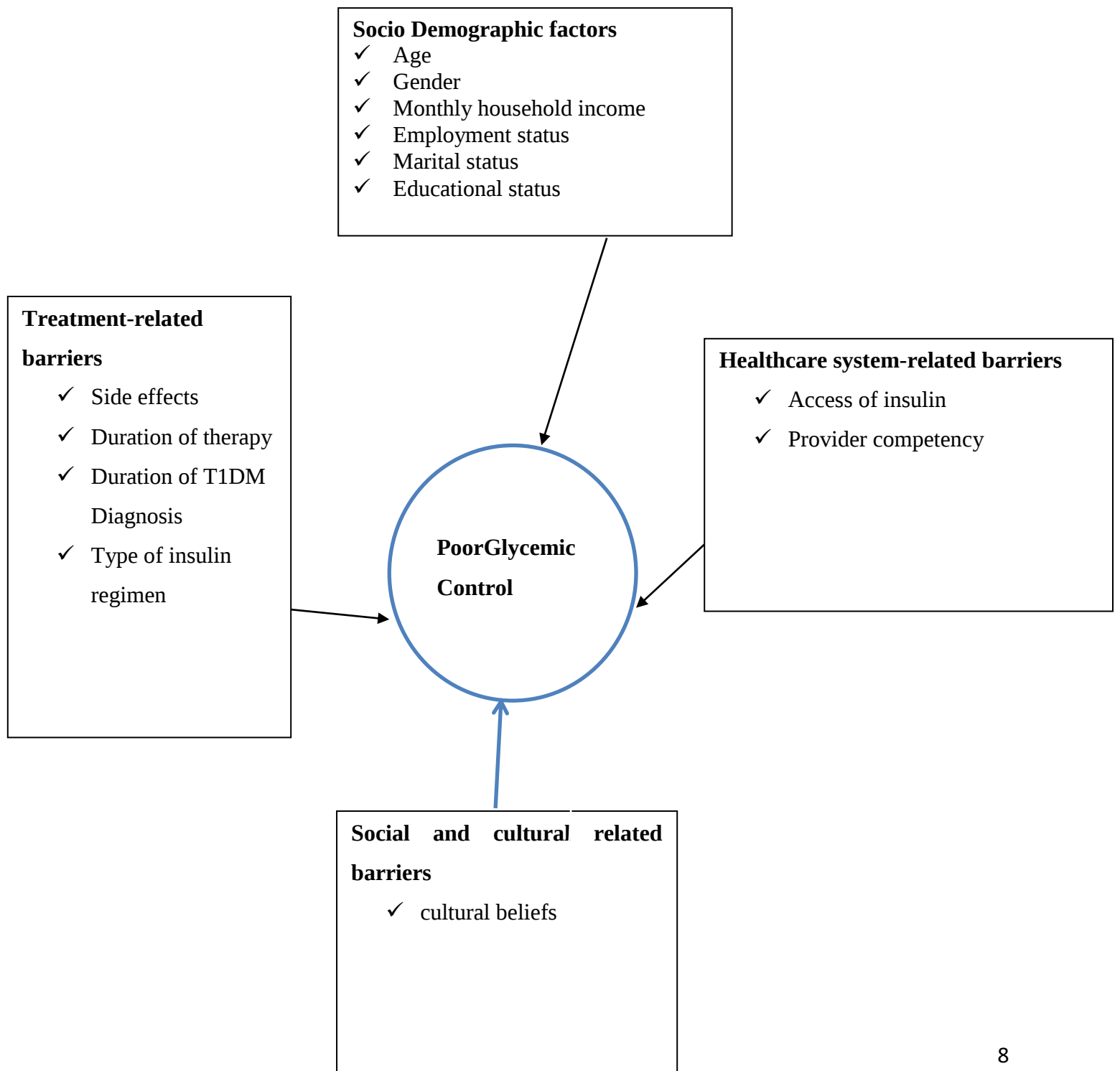
Supply chain issues: interruptions in the supply of insulin and related materials can lead to inconsistent therapy, adversely affecting glycemic control(12).

2.2.5 Cultural and Social Barriers: Cultural beliefs and social dynamics can influence insulin use

Stigma and Misconceptions: Cultural stigma associated with insulin injections and misconceptions about diabetes may discourage patients from adhering to treatment. Patients are more likely to stick with the treatment when better informed and positive. Misconceptions about insulin, fear of injections, concern about side effects — all can cause resistance to beginning therapy. Compliance may also be limited by a lack of community or family support, as patients may feel isolated(12).

Support Systems: lack of family or community support can further impede adherence, as patients may feel isolated in their management efforts(12).In conclusion, improving adherence and attaining better health outcomes for patients with type 1 diabetes necessitates a comprehensive strategy that includes patient education, socioeconomic support, healthcare system strengthening, and cultural sensitivity. Tailor-made interventions that take into account the particular difficulties in the Ethiopian context are crucial (17).

Figure 1: Conceptual Framework



Chapter 3: Objective

3.1. General objective

- ✓ To assess the barriers that hinder the effective insulin therapy in adult patients with poorly controlled type1 diabetes mellitus attending diabetic follow-up clinic at ARTH.

3.2. Specific objectives

- ✓ To identify treatment related barriers to effective insulin therapy in adult patients with poorly controlled type 1 diabetes mellitus at ARTH,Ethiopia,2025
- ✓ To evaluate healthcare system-related barriers to effective insulin therapy in adult patients with poorly controlled type 1 diabetes mellitus at ARTH,Ethiopia,2025
- ✓ To assess psychosocial and cultural-related barriers to effective insulin therapy in adult patients with poorly controlled type 1 diabetes mellitus at ARTH,Ethiopia,2025

CHAPTER 4: Method and Materials

4.1 Study area

The study was conducted at Asella referral and teaching hospital which is in the town of Asella. Asella is a town in which is in the Arsi Zone of the Oromia Region about 175 kilometers from Addis Ababa, the capital city of the country. Arsi University is one of the young universities in Ethiopia established in 2014. Since 1964 Asella Teaching and Referral Hospital has served populations in Arsi and the nearby zones with a current population of 3.8 million. The hospital has 321 beds with more than 6 departments. The hospital is involved in training undergraduate and postgraduates in different specialties in 04 major departments. The hospital has been improving its health service delivery and currently has modern investigation modalities like Digital X-rays, portable X-rays, and different types of Ultrasound, Echocardiography, Computerized tomography scans, and culture service. The Department of Internal Medicine has a separate DM, Neurology follow-up clinics which is functional 5 days per week. There are 1950 type 1 Diabetes mellitus patients on regular follow-up at DM clinic as taken from the HMIS logbook of the clinic. The monthly patient flow averages around 900. The clinic rests its services on 21 specialists, 3 specialists, 36 residents, and 4 nurses.

4.2. Study design and period

Institution-based cross-sectional study design was used to assess barriers to effective insulin therapy in adult patients with poorly controlled type 1 diabetes mellitus at, AU, ARTH

4.3 Source and Study Population

4.3.1. Source population

All type 1 diabetic adult patient on follow-up at ARTH during the study period.

4.3.2. Study population

All adult Type 1 diabetic patients who fulfill eligibility criteria and have follow-up at ARTH.

4.4. Eligibility Criteria

4.4.1 Inclusion criteria

Age ≥ 18 years.

Patients who were diagnosed to have type 1 diabetes.

Patients who have a willingness to participate in the study.

On insulin therapy for at least 6 months

4.4.2 Exclusion Criteria

Critical patients with hyperosmotic hyperosmolar state or diabetic ketoacidosis,

Mentally incompetent, Psychotic patients,

Patient with severe co-morbid condition

Patient with non-adherence due to non-modifiable factors

Pregnant women

Individuals with T2 DM patient

4.5. Sample size and sampling procedures

4.5.1. Sample size determination

The sample size for the study was determined using a single population formula considering the following assumption. According to the study done in public hospitals of the central zone of Tigray, on the adherence to insulin therapy, the adherence rate was 24.2 %, good knowledge of DM, age, knowledge regarding self-injections, attitude towards insulin injection, cost, having glucometer at home significantly affect adherence of insulin. Taking a 95% confidence interval, the margin of error is 5%(21).

$$n = (Z\alpha/2)^2 * P * (1 - P) / d^2$$

Where:

n = the required sample size

Z = standard score corresponding to a 95% confidence interval

P = 0.242 (24.2% prevalence from previous study)

d = the margin of error (precision)

Using the given values:

$n = (1.96)^2 * 0.245 * (1 - 0.242) / 0.05^2 = 282$, After Adjusting for non-response rate 10% non-response rate were added and the final sample size was $n=282+(0.10 \times 282)=310$

4.5.2. Sampling procedure

A systematic random sampling technique was used to select participants during clinic visits who fulfill inclusion criteria. Then the first participant will be selected using the lottery method and every K^{th} of the participants will be taken, the K value being $K= N/n$. i.e. in the past 6 Months around 1950 T1DM patients visited the clinic, $sok=1950/282=7$, hence every 7th patient will be taken.

4.6. Study variables and Measurements

The dependent variable was poor glycemic control. The independent variables were socio-demographic variables (age, sex, educational status, income, religion, ethnicity, marital status, occupational status), treatment related factors (insulin regimen type, insulin regimen complexity, insulin adherence), healthcare system-related barriers (access to insulin, Provider competency), treatment-related barriers (insulin regimen complexity, side effects, BGM frequency), social and cultural barriers (stigma associated with diabetes, family support, cultural beliefs), Psycho-social factors (depression, fear of insulin injection)

4.6.1. Operational Definitions

Poor glycemic control: It was defined as having HbA1c level $> 7\%$ at the time of the study.

Good glycemic control: a glycemic control was considered to be good when a patient had HbA1c $< 7\%$ for adult diabetic patients. It was obtained from the most recent laboratory result (17).

An income level: Patients' self-reported monthly household income is categorized into **tertiles (low, middle, high)** based on the distribution within the study population and local economic context. It was measured from self-reported monthly income collected via a structured questionnaire (18)

Adherence to Insulin: A patient was considered to have adhered to his/her anti-diabetic medication when the patient scored at least 80% of the total of Morisky medication scale (19)

Depression is the presence of depressive symptoms that may affect insulin adherence. It can be measured by using Patient Health Questionnaire-9(PHQ-9) with scores ≥ 10 indicating depression (19)

Demographic Factors

Age is the patients' age at the time of the study. It can be obtained from medical records or self-report

Gender Male or Female can be obtained from self-report.

Educational level: no formal education, primary, secondary, or tertiary. It was taken from Self-report via questionnaire. Similar categories are used in numerous Ethiopian diabetes studies

Access to insulin is the availability and affordability of insulin for the patient. It can be measured by assessing availability and affordability (20).

An insulin regimen complexity The complexity of the prescribed insulin regimen, categorized as: Simple: Once-daily basal insulin and Complex: Multiple daily injections (basal-bolus or premixed regimens).was taken from medical chart or patient report.

Side Effects: hypoglycemia episodes of low blood sugar (70mg/dl) experienced by the patient in the past month. It can be either self-reported by the patient or documented in medical records.

Other side effects attributed to insulin therapy like weight gain, and injection site reactions (21).

Cultural Beliefs are misconceptions or traditional beliefs about diabetes or insulin therapy. It was assessed through open-ended questions or checklist of common cultural beliefs

4.8.Data collection procedures

A pretest was done on 5% of the sample before the actual data collection starts. Data extraction tools were developed in English version and then the data were collected by trained nurses supervised by medical residents. A format that contains study variables of interest was prepared.

4.9. Data quality control

The data was collected by nurses and from patients' charts documented by the clinicians as well as using interviewer-administered structured questionnaires. The principal investigator trained coordinated the process of data collection. The data collection format was checked for its completeness and any gap identified was corrected immediately.

4.10. Data processing and analysis

Data was collected by kobotool box and was entered using and analyzed by SPSS version 27. Descriptive statistics was carried out, and categorical variables were reported as frequencies and percentages whereas; median and interquartile range (IQR) was used for continuous variables. Binary logistic regression analysis was applied to identify barriers associated with poor glycemic control in adult patients with type 1 DM. P value < 0.25 in the bivariate logistic regression was fitted into the multivariable logistic regression analysis. The Hosmer–Lemeshow goodness-of-fit test indicated that the model was a good fit to the data ($\chi^2 = 12.822$, $df = 8$, $p = 0.118$). The level of significance was declared at a p-value of <0.05

4.11. Ethical considerations

Ethical clearance was obtained from the Asella College of Health Sciences research committee. Then, an official letter was delivered to data manager. Moreover, after getting permission, patient charts that fulfill the criteria were selected. Confidentiality of data collected was kept and a name of the patients was not being included during data collection and information was not be exposed to third parties.

4.12. Results Dissemination plan

The final result of this thesis was presented for a research defense at Arsi University, Asella Referral, and Teaching Hospital, and disseminated to the Internal medicine department, Hospital Administrative, policymakers, regional and federal health bureau for service improvements and research coordinating office for publication of the research work.

CHAPTER 5: RESULT

5.1. SOCIODEMOGRAPHIC CHARACTERISTICS

A total of 273 respondents were included in the study. The majority of the participants were aged 19–30 years, accounting for 204 (74.7%), followed by those aged 30–45 years with 50 (18.3%). Respondents aged ≤ 18 years constituted 15 (5.5%), while only 4 (1.5%) were aged 45 years and above. Regarding religion, nearly half of the respondents were Muslim, 136 (49.8%), followed by Orthodox Christians, 103 (37.7%), and Protestants, 34 (12.5%).

In terms of marital status, 132 (48.8%) of the participants were single, while 133 (48.7%) were married. A small proportion were divorced, 7 (2.6%), and only 1 (0.4%) participant was widowed. Concerning place of residence, 138 (50.5%) respondents resided in urban areas, whereas 135 (49.5%) lived in rural areas.

With respect to educational status, 106 (38.8%) of the respondents had completed primary school, 91 (33.3%) had secondary school education, and 37 (13.6%) had attended college or university. Additionally, 39 (14.3%) of the participants had no formal education. Regarding occupation, 111 (40.7%) of the respondents were unemployed, followed by farmers, 77 (28.4%). Government employees accounted for 35 (12.8%), merchants for 34 (12.5%), and daily laborers for 16 (5.9%).

In terms of sex distribution, 155 (56.8%) of the respondents were male, while 118 (43.2%) were female. Concerning monthly income, the majority of participants had low monthly income, 166 (60.8%), followed by those with middle monthly income, 88 (32.2%). Only 19 (7.0%) of the respondents reported having high monthly income

Table 2:Sociodemographic Factors of Adult type 1 diabetic patient at ARTH,2025

Variable	Category	Frequency	Percent
Age Category	≤ 18	15	5.5 %
	19-30	204	74.7%

	30-45	50	18.3%
	≥45	4	1.5 %
Religion	Muslim	136	49.8%
	Orthodox	103	37.7%
	Protestant	34	12.5%
Marital status	Single	132	48.8%
	Married	133	48.7%
	Divorced	7	2.6%
	Widowed	1	0.4%
Residence place	Urban	138	50.5%
	Rural	135	49.5%
Educational status	No formal education	39	14.3%
	Primary school	106	38.8%
	Secondary school	91	33.3%
	College or university	37	13.6%
Occupation	Unemployment	111	40.7%
	Daily laborer	16	5.9%
	Merchant	34	12.5%
	Famer	77	28.4%
	Government employee	35	12.8%
Gender	Male	155	56.8%
	Female	118	43.2%
Monthly income	Low monthly income	166	60.8%
	Middle monthly income	88	32.2%
	High monthly income	19	7%

5.2. TREATMENT RELATED FACTORS

Most respondents 224 (82.1%) were receiving basal only insulin regimens whereas 49 (17.9%) of respondent were receiving basal bolus. Regarding Insulin side effect 97 (35.5%) of

respondent had developed hypoglycemia, whereas 48(17.6%) had weight gain,45(16.5%) had injection site reactions whereas 83(30.4%) reported no side effects. Regarding duration of therapy 64(23.4%) took insulin for less than 1year but more than 6 months where as 209(76.6%) took for more than 1year.

Table 3: Treatment Related factors in adult patient with poorly controlled T1DM at ARTH,2025

		Frequency	Percentage
type of insulin regimen	basal only	224	82.1%
	basal bolus	49	17.9%
side effects of insulin	hypoglycemia	97	35.5%
	weight gain	48	17.6%
	injection site reactions	45	16.5%
	none of the side effects	83	30.4%
duration of t1dm therapy	6months to 1yr	64	23.4%
	>1yr	209	76.6%

As illustrated on table 2,the frequency and percentage of each variables are explained by N and % respectively

5.6. HEALTH CARE RELATED FACTORS

Access to insulin in healthcare facilities was assessed among the study participants. As presented in Table 5, more than half of the participants 148 (54.2%) reported that they had no faced shortage of insulin at their health care facility from in the past 3months..Regarding the Provider competency 252 (92.3%) of respondent were very satisfied with the service provided by the health care provider

Table 4: Health Related Factors of adult patient with type 1Dm at ARTH,2025

Variables	Category	Frequency	Percentage
access to insulin in healthy facility	yes	125	45.8%
	no	148	54.2%
provider compitency	very dissatisfied	21	7.7%
	very satisfied	252	92.3%

As illustrated above table 3 the frequency and percentage are explained by N and % respectively

5.7. PSYCHOSOCIAL AND CULTURAL FACTORS

Regarding cultural beliefs, 53 participants (19.4%) believed that herbal medication can replace insulin in the treatment of type 1 diabetes mellitus, while 220 (80.6%) did not hold these beliefs. Based on the PHQ-9 screening tool, 54 participants (19.8%) were identified as having depression, while 219 (80.2%) screened negative for depression.

Table 5:Psychosocial and cultural factors in adult patients with poorly controlled T1DM at ARTH,2025

Variables	Categories	Frequency	Percentage
cultural belief	yes	53	19.4%
	no	220	80.6%

Depression status based on PHQ_9	no depression	219	80.2%
	depression	54	19.8%

Note: Include cultural belief, Depression and their frequency and percentage.

5.8. FACTORS ASSOCIATED WITH POOR GLYCEMIC CONTROL

Multi-variable binary logistic regression was performed to identify variables that were independently related to poor glycemic control in adult patients with type 1 diabetes mellitus. Poor glycemic control in adult patients with type 1 diabetes was found to be independently associated with several variables after adjusting for potential confounding variables.

Patients with depression were nearly three times more likely to have poor glycemic control compared to those without depression (AOR = 2.92; 95% CI: 1.39–5.95.15; $p = 0.004$). Those with good adherence to insulin therapy had 61% lower odds of poor glycemic control than patients with poor adherence (AOR = 0.39; 95% CI: 0.16–0.97; $p = 0.04$). Patients on a basal-only insulin regimen were more likely to have poor glycemic control compared to those on a basal-bolus regimen (AOR = 2.045; 95% CI: 1.055–3.964; $p = 0.034$). Regarding socioeconomic status, patients with low monthly income were 54% more likely to have poor glycemic control compared to those with high income (AOR = 1.54; 95% CI: 1.30–2.96; $p = 0.049$). Other variables, including, provider competency, and middle and higher income levels, were not statistically significantly associated with poor glycemic control in the adjusted model.

Table 6: Factors associated with poor glycemic control in adult patients with T1DM at ARTH, 2025

Variables	Category	Good glycemic control (%)	Poor glycemic control (%)	COR	AOR	P-value
Depression	No	47	53	1	1	-

Yes		24.1	75.9	2.79	2.9 (1.39-5.95)	0.004
Type of insulin regimen	Basal bolus	53.1	46.9	1	1	-
	Basal only	40.2	59.8	1.68	2.045(1.055-3.96)	0.034
Cultural belief	No	45.9	54.1	2.15	0.5(0.25-1.002)	0.052
	Yes	28.3	71.7	1	1	-
Provider competency	Very satisfied	57.1	42.9	1	1	-
	Very dissatisfied	41.2	58.8	1.89	1.201(0.933-1.545)	0.155
Adherence to insulin	Good adherence	53.4	46.6	0.82	0.39(0.16-0.97)	0.04
	Poor adherence	48.5	51.5	1	1	-
Monthly income	Low	37.7	62.3	2.97	1.54(1.30-2.96)	0.049
	Middle	52.2	47.8	1.97	0.44(0.12-1.62)	0.218
	High	64.3	37.7	1	1	

As illustrate on this table 1=reference COR=Crude odd ratio, OR=Adjusted odd ratio value<0.05 declared as significant data

CHAPTER 6: DISCUSSION

Glycemic management is a key technique for preventing complications caused by diabetes. These complications are much more frequent in individuals with uncontrolled diabetes, such as retinopathy, nephropathy, neuropathy, and cardiovascular disease. Proper glycemic control is also an important method to reduce morbidity and mortality from diabetes and prevent or delay the destruction of target organs (18). This paper evaluated variables that were linked to inadequate glycemic control in adult diabetic patients in Asela Referral and Teaching Hospital. The results prove that poor glycemic control is extremely prevalent and significantly depends on psychosocial, socioeconomic, as well as treatment-related factors. Among the factors in this study that were found to be independent predictors of poor glycemic control were depression, low monthly income, insulin regimen type, and adherence to insulin therapy. Depressed patients had nearly triple the risk of having poor glycemic control as compared to undepressed patients. Findings of the current study demonstrate that there is a strong relationship between the level of glycemic control and severity of depression. Increased levels of depressed symptoms can affect glycemic levels of individuals with type 1 diabetes, which is consistent with previous studies conducted in Turkey associating mental health status with diabetes treatment

(19). The presence of depression results in lack of motivation, cognitive function, and decision-making, which can result in poor engagement with care and missed insulin doses (10) (19). This study underscores the great psychological burden that diabetic patients have to bear in addition to the need to embrace mental health screening and management as a part of routine diabetes management. The low monthly income, in this study, was significantly related to poor glycemic control.

The low income earned monthly by the respondents put those with low income 54 percent more likely to have poor glycemic control than those who had high income (AOR = 1.54; $p = 0.049$). This was in line with the previous studies conducted at Adama and Jimma (20) (21), who found out that low monthly income earned was significantly associated with poor glycemic control. In resource-constrained settings, financial constraints often due to the impact of insufficient resources often lead to inconsistent treatment, insulin rationing, or complete discontinuation of therapy, which deteriorate glycemic outcomes (22).

Regular self-assessment of the level of blood glucose might assist patients to better manage their levels of glycemic control through the provision of socioeconomic support system alongside clinical interventions (23). Therefore the results in this study emphasize that, besides clinical interventions, patients require the provision of the socioeconomic support system to enhance their glycemic control.

The first principle of diabetes mellitus management is through glycemic control, which is the key to avoiding both short-term and chronic effects. Insulin is one of the treatment options, which is used either as a single regimen or multiple regimen therapy to patients with type I diabetes or as an add-on therapy to patients with type II diabetes who cannot reach a sufficient degree of glycemic control using oral hypoglycemic drugs (24). This study demonstrates that patients on a basal-only regimen were 2 times more likely to have poor glycemic control than patients of a basal-bolus regimen (AOR = 2.045; 95% CI: 1.055-3.964; $p = 0.034$). Currently no published evidence. One of the determinants of total glycemic exposure and HbA1c is post-prandial glucose elevations (25).

Postprandial glucose elevations are a key determinant of overall glycemic exposure and HbA1c (26). Basal-bolus regimens (with rapid-acting prandial insulin) reduce post-meal hyperglycemia more effectively than regimens without mealtime insulin (26). It comprises rapid-acting insulin at mealtimes to cover carbohydrate intake and correction boluses to suppress high levels of sugar beyond the basal coverage.

This is a close approximation of the normal patterns of pancreatic insulin delivery (27). In the present research, good adherence to insulin therapy was 61% lower than poor adherence to insulin therapy (AOR = 0.39; 95% CI: 0.16-0.97; $p = 0.04$). Physical compliance with insulin administration is of vital importance to improve glycemic control, as regular insulin intake will stabilize blood glucose levels and lower the incidence of fasting and post-prandial hyperglycemia, which is compared with poor adherence to insulin and excessive blood glucose fluctuations, which in turn leads to high glycemic control and poor glycemic control respectively.

Non-adherence to insulin is also common in Ethiopian literature and has been found to be a strong predictor of poor glycemic control; one study did a cross-sectional study in Northwest Ethiopia where high adherence levels were followed by significantly lower odds of poor glycemic control (AOR = 0.003; $p = 0.002$) than low adherence levels (28). The systematic

review of glycemic control in Ethiopia also points out that the high burden of uncontrolled blood glucose among diabetic patients is due to poor adherence to medication (29).

Globally, systematic evaluations and cohort studies corroborate this relationship: adherence to insulin therapy remains suboptimal worldwide (with pooled adherence around ~55%), and higher adherence levels have been consistently associated with improved HbA1c outcomes and greater likelihood of achieving glycemic targets, as shown in systematic reviews and observational analyses (30). Together, this evidence underscores that adherence is a modifiable and key determinant of glycemic control, making it an important focus for clinical support and patient education both in Ethiopia and internationally.

CHAPTER7: STRENGTH AND LIMITATIONS OF THE STUDY

7.1 .STRENGTH

This study has notable strengths that enhance the credibility and relevance of its findings. It included an adequate sample size and comprehensively assessed sociodemographic, treatment-related, healthcare-related, psychosocial, and cultural factors affecting glycemic control. The use of multivariable logistic regression improved analytical rigor by controlling for confounders and identifying independent predictors. Standardized tools such as the PHQ-9 increased measurement reliability and comparability with existing studies. Furthermore, the discussion effectively integrates national and international evidence. Identification of modifiable factors, including depression, insulin adherence, insulin regimen type, and low monthly income, provides practical guidance for improving glycemic outcomes in resource-limited settings.

7.2. LIMITATION

The cross-sectional design does not provide an opportunity to build causal relationships between predictors and glycemic control. Adherence was measured using self-reported measures that were likely to be affected by recall or social desirability bias. The research was only done in one referral hospital, and it is possible that the findings are not generalizable to other settings. Certain factors that could be of importance, like dietary habits and physical exercise, were not examined.

CHAPTER 8:CONCLUSION AND RECOMMENDATION

8.1. CONCLUSION:

The occurrence of poor glycemic control is high among adult patients with diabetes who visit Asela Referral and Teaching Hospital. This research determined that depression, low monthly income, insulin regimen type, and poor adherence to insulin therapy were important independent predictors of poor glycemic control. The strongest determinant was depression, which points to the importance of psychological health in the management of diabetes. The results emphasize the view that ideal glycemic control must be an integrated methodology that covers mental health, socioeconomic issues, and compliance with therapy, in addition to clinical management.

7.2. RECOMMENDATIONS

For Healthcare Providers

Periodically assess diabetic patients of depression with standardized instruments including PHQ-9 and conduct timely counseling or referral.

Enhance patient education on insulin injection, compliance,

To Hospital Administrators and Policymakers.

Incorporate mental health care in clinics that offer diabetes care.

Establish financial aid schemes to assist patients with low incomes, such as subsidies of supplies of insulin and monitoring of glucose levels.

Increase availability of organized diabetes education in state hospitals.

For Researchers

Find causal relationships between depression, adherence and glycemic control by conducting longitudinal and interventional studies..

Determine the efficacy of mental health-intervention in conjunction with adherence to improve glycemic outcomes.

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Annexes

Annex 1: Subject information sheet

Arsi University College of medicine and health science, department of internal medicine.

My name is I am here on behalf of Dr.Gemechu Meribo, from AU,ARTH he is conducting research on '**Assessing barriers to effective insulin therapy in adult patients with poorly controlled type1 DM**' in ARTH for the partial fulfillment of a specialty program in Arsi University. He received permission from Arsi University's institutional review board (IRB) and the regional health bureau to conduct this study. This study aims to assess 'barriers to effective insulin therapy in adult patients with poorly controlled type 1DM. The study will help in providing baseline data for policymakers and other researchers on issues regarding diabetic care. You are selected randomly to participate in this study because you are eligible for this study. Your participation is purely based on your willingness. You have full right either to participate or decline to be a participant in this study. If you choose to take part in the study you may respond to all the questions or you may not answer questions you don't want to, and have the right to stop the interview at any time. You also have the right to choose not to take part in this study. Participating in this study will not have any risk or harm. Whether you are willing to participate, refuse, or decide to withdraw later, you will not be subjected to any ill-treatment if you agree to participate in the study, you will be asked to answer some questions about yourself, and the interview lasts with you will take about 20-30 minutes. Any information that you provide will be kept confidential, names will not be written or specified and all the questionnaires will be coded for anonymity. No one will have access to the non-coded data except the principal investigator. Only the principal investigator will know the details and He will discard them after completing the analysis. The data will not be used for purposes other than the study. Your willingness and active participation are very important for the success of this study.

Annex II: Informed consent

The above information regarding my participation in the study is clear to me. I have been given a chance to ask questions and my questions have been answered to my satisfaction. My

participation in this study is entirely voluntary. I understand that my records will be kept private and that I can leave the study at any time.

Respondent agrees to participate.

Yes

No

1. If yes, continue the interview.
2. If no, skip to the next participant by writing reasons for his refusal.
3. _____

Informed consent Certified by:

Respondent's signature/thumb print _____ Date _____

Interviewer: Name _____ Signature _____

Questionnaire ID number _____

Date of interview _____ Time started _____ Time completed _____

Result of interview:

1. Completed 2. Respondent not available 3. Refused 4. Partially completed

Checked by: Supervisor: Name _____ Signature _____

Annex III: Questionnaires

The questionnaire was prepared to assess barriers to effective insulin therapy in adult patients with poorly controlled type 1DM

Date..... Study Site..... Code.....

Encircle only one correct response.

Part 1: Socio-demographic and economic factors

A) Age

How old are you=-in years

B) Gender

Male

Female

C) Educational level

No formal education

Primary school

Secondary school

Tertiary education (university or college)

D) Employment Status

Unemployment

Daily laborer

Merchant

Government employee

Farmer

Other specify

E) Marital Status

Single

Married

Divorced

Widowed

Residence

Urban

Rural

Religion

Muslim

Protestant

Orthodox

Other specify

F) Monthly household income

Less than 5000etb

5000 to 10000etb

Greater than 10000etb

Part 2: Diabetes Related Information

G) duration of Diabetes diagnosis

Less than 1yr

1-5 yrs

H) HgA1c level

What was your most recent HbA1c level= %(if not known verify from the medical record)

I) Insulin regimen type

Basal insulin only

Basal bolus insulin

Patient 3: Patient-related barriers

Adherence to insulin therapy

In the past month, how often did you miss an insulin dose?

Never

Rarely (1-2 times)

Sometimes (3-4time

Financial constraints

Do find it difficult to afford insulin or related supplies

Yes

No

Patient 4: Healthcare system-related barriers

Access to insulin

Have you ever experienced a shortage of insulin at your healthcare facility?

Yes

No

Provider competency

On a scale of 1-5, how satisfied are you with the diabetes education provided by your healthcare provider

1 =very dissatisfied

5=very satisfied

Part 5: Treatment-related Barriers

Side effects of insulin

Have you experienced any side effects from insulin therapy in the past month?

Hypoglycemia =

Weight gain =

Injection site reactions=

None of the above=

Part 6: Social and Cultural Barriers

Cultural Beliefs

Do you believe that traditional remedies or cultural practices can replace insulin therapy?

Yes

No

PHQ9				
Over the last 2 weeks, how often have you been bothered by any of the following problems? (Use 1 to indicate your answer	Not at all (score = 0)	Sometimes(score= 1)	More than half the days (score = 2)	Nearly every day (score = 3)
1. Little interest or pleasure in doing things				
2. Feeling down, depressed, or hopeless				
3. Trouble falling asleep, or staying asleep, or sleeping too much				
4. Feeling tired or having little energy				
5. Poor appetite or overeating				
6. Feeling bad about yourself - or that you are a failure, or have let yourself or your family down				
7. Trouble concentrating on things, such as reading the newspaper or				

watching television				
8. Moving or speaking so slowly that other people could have noticed? Or the opposite - being so fidgety or restless that you have been moving around more than usual				
9. Thoughts that you would be better off dead or of hurting yourself in some way				
TOTAL SCORE =				

MMAS-8	Yes	No
Do you sometimes forget to take medications?		
Over the past 2weeks,were there any days when did you not take your medication?		
Have you ever cut without telling your doctor because you felt worse when you take it?		
When you travel or leave home,do you sometimes forget to bring your medication?		
Did you take all your medication yesterday?		
When you feel like your symptoms under control,do		

you some times stop taking your medication?		
Do you ever feel hassled about sticking to your treatment plan?		
How often have you had difficulty remembering to take all your medication? Never?rarely Once in a while Sometimes Usually All the time		
Total		

DABALATA

DABALATA I :WARRAAQSA ODEEFFANNOO

Yuunivarsiitii Arsii Kolleejjii saayinsii fayyaa,fi kutaa dhibee keessoo. Ani maqaan kan asii gaditti mallatessee mata duree 'Dhukkubsattoota ga'eessota dhukkuba sukkaara gosa 1ffa to'annoo gaarii hin qabne kan hospitaala Asallaa keessatti hordoffi qaabna irratti gufuulee yaala insuliinii bu'a qabeessa ta'an irratti qorannoo gaggeessa jira.Qorannoo kana gaggeessuuf eeyyama boordii gamaaggama dhaabbilee (IRB) Yunivarsiitii Arsii fi biiroo fayyaa naannichaa irraa argadheera.Qorannoon kun dhimmoota kunuunsa dhukkuba sukkaaraa ilaallatan irratti qaamolee imaammata baasan fi qorattoota biroof ragaa bu'uura kennuu keessatti gargaara. Qorannoo kana irratti hirmaachuuf akka tasaa kan filatamte qorannoo kanaaf ulaagaa waan Guuttuuf.

Hirmaannaan keessan fedhii keessan qofa irratti kan hundaa'edha. Qorannoo kana keessaatti hirmaachuu ykn diduu mirga guutuu qabda. Yoo qo'annoo irratti hirmaachuu filatte gaaffilee

hundaaf deebii kennuu dandeessa ykn gaaffilee hin barbaanne deebisuu dhiisuu dandeessa, yeroo barbaaddetti gaaffii fi deebii dhaabuuf mirga qabda. Qorannoo kana irratti hirmaachuu dhiisuu filachuufis mirga qabda. Qorannoo kana irratti hirmaachuun balaa fi miidhaa tokkollee hin qabaatu. Gaaffii fi deebiin kan fudhatu immoo gara daqiiqaa 20-30 fudhata.

Odeeffannoon isin kennitan kamiyyuu iccitii ta'ee kan eegamu yoo ta'u, maqaan hin barreeffamu ykn hin ibsamu akkasumas gaaffileen hundi maqaan isaanii akka hin dhahamneef koodii ni kennama. Qorataa ijoo malee namni daataa koodii hin qabne kana argachuu hin danda'u. Bal'inaan kan beeku qorataa muummee qofa yoo ta'u, xiinxala erga xumuree booda ni gata. Daataan kun qorannichaan alatti kaayyoo biraatiif hin oolu. Milkaa'ina qorannoo kanaaf fedhii fi hirmaannaan keessan baay'ee barbaachisaa dha.

Dabalata II: foormii hayyama odeeffannoo

Hirmaannaa koo qorannicha ilaalchisee odeeffannoon armaan olii naaf ifaadha. Carraan gaaffii akkan gaafadhu naaf kennamee gaaffiin koos deebii na quufaargateera. Qo'annoo kana keessatti hirmaachuun koo guutummaatti fedhii kooti. Galmeen koo dhuunfaatti akka eegamu fi yeroo barbaadetti qo'annoo sana keessaa bahuu akkan danda'u nan hubadha.

Deebii kennaan hirmaachuuf walii gala.

Eeyyee Lakki

1.Yoo eeyyee ta'e gaaffii fi deebini itti fufaa.

2.Yoo lakki ta'e sababa diduu isaa barreessuudhaan gara hirmaataa itti aanutti darbi.

3._____ .

Hayyama odeeffannoo qabu Kan mirkanaa'e:

Mallattoo abba deebii kennuu/kennitu _____ Guyyaa
_____ .

Gaaffii fi deebii: Maqaa _____ Mallattoo _____ .

Lakkoofsi eenyummaa gaaffilee _____ .

Guyyaa af-gaaffii _____ Yeroo jalqabame _____ Yeroo xumurame _____ .

Bu'aa af-gaaffii:

1. Xumurame 2. Deebii kennaan hin jiru 3. Dide 4. Gartokkoon xumurame

Kan sakatta'ame: Suppervaayizara: Maqaa _____
Mallattoo_____ .

Dabalata III: Gaaffiilee

Gaaffiin kun dhukkubsattoota ga'eessota dhukkuba sukkaara gosa tokkoffa to'annoo gaarii hin qabne qaban irratti gufuulee yaala insuliinii bu'a qabeessa ta'e madaaluuf qophaa'eera

Guyyaa..... Bakka Qo'annoo.....Koodii.....

Deebii sirrii tokko qofa marsi.

Kutaa 1ffaa: Dhimma hawaas- dinagdee

A) Umurii

Umriin kee meeqa=-waggaa dhaan

B) Saala

Dhiira

Dhalaa

C) Sadarkaa barnootaa

Barnoota idilee hin qabu

Mana barumsaa sadarkaa tokkoffaa

Mana barumsaa sadarkaa lammaffaa

Barnoota sadarkaa olaanaa (yunivarsiitii ykn kolleejjii)

D) Haala Hojii

Hoji hin qabu

Hojjetaa guyyaa guyyaa

Daldalaa

Hojjetaa mootummaa

Qotee bulaa

Kaan ibsu

E) Haala Gaa'elaa

Qeenxee

Kan fuudhe

Kan Hiikaan

Dubartii abbaan manaa irraa du'e

F) Iddoo Jireenyaa

Magaalaa

Baadiyyaa

G)Amantaa

Muslima

Pirootestaantii

Ortodoksii

F) Galii maatii ji'a ji,aan argatu

5000etb gadi

5000 hanga 10000etb

10000 0l

Kutaa 2ffaa: Odeeffannoo Dhukkuba Sukkaaraa Waliin Walqabatu

G) yeroo dhukkubni Sukkaaraa adda baafamuu

1yr gadi

1-5 waggaa

H) Sadarkaa HgA1c

Sadarkaan HbA1c kee inni dhiyoo maal ture= %(yoo hin beekamne galmee yaalaa irraa mirkaneessi)

I) Sirna insuliinii

Insuliinii basal qofa

Insuliinii basal bolus

Dhukkubsataa 3ffaa: Gufuuwwan dhukkubsataa wajjin walqabatan

A)Yaala insuliinii hordofuu

Ji'a darbe keessa yeroo meeqa doosiin insuliinii tokko irraa hafte

Gonkumaa

Yeroo muraasa (yeroo 1-2) .

Yeroo tokko tokko (yeroo 3-4)

B) Rakkoo maallaqaa

Insuliinii ykn meeshaalee kanaan walqabatan bitachuuf qarshii dhabdani beektuu?

Eeyyee

Lakki

Dhukkubsataa 4: Gufuuwwan sirna eegumsa fayyaa wajjin walqabatan

A) Insuliinii argachuu

Dhaabbata eegumsa fayyaa keessanitti hanqinni insuliinii isin mudatee beekaa?

Eeyyee

Lakki

B) Hordoffii irra deddeebiin

C) Itti quufinsa Tajaajila

Iskeelii 1-5 irratti, barnoota dhukkuba sukkaaraa ogeessi fayyaa keessaniin kennamutti hangam itti quuftan

1 =baay'ee itti hin quufne

5=baayyee quufa

Kutaa 5ffaa: Gufuulee wal'aansa waliin walqabatan

Walxaxiinsa sirna insuliinii

B) Miidhaa gamaa insuliinii

Ji'a darbe keessa yaala insuliinii irraa miidhaa cinaa isin mudateeraa?

Dhibee sukkaaraa gadi bu'aa

Ulfaatina qaamaa dabaluu

Deebiin bakka lilmoo itti kenname

Kanneen armaan olii keessaa tokkollee

Kutaa 6ffaa: Gufuulee Hawaasummaa fi Aadaa

Maqaa balleessii

A) Deeggarsa maatii

Iskeelii 1 hanga 5tti, dhukkuba sukkaaraa kee to'achuu keessatti maatii kee irraa deeggarsa hangamii argatta?

1=deeggarsa hin qabu

5= deeggarsa guddaa qaba

Amantaa Aadaa

Qorichootni aadaa ykn gochoonni aadaa wal'aansa insuliinii bakka bu'uu danda'u jettanii amantuu?

Eeyyee

Lakki

PHQ9				
Torban 2 darban keessatti rakkoolee armaan gadii keessaa tokko yeroo meeqa si mudateera? (Deebii kee agarsiisuuf itti fayyadami.	Gonkumaa (qabxii = 0)	Yeroo tokko tokko (qabxii = 1)	Guyyaa walakkaa ol (qabxii = 2)	Guyyaa hunda jechuun ni danda'ama (qabxii = 3)
Miira gadda, dhiphina ykn abdii kutachu				
Rakkina hirriba, ykn rakkina hirriba keessa turuu, ykn garmalee rafuu				
Dadhabbiin ykn dadhabbiin itti dhagahama				
Fedhii nyaataa dhabuu ykn garmalee nyaachuu				
Ofitti miira hamaa - ykn akka kufte, ykn ofii ykn maatii kee gadi dhiisuu				
Wantoota akka gaazexaa dubbisuu ykn televijiinii ilaaluu irratti xiyyeeffachuuf rakkachuu				

Namoonni kaan akka hubatan socho'uu moo suuta jechuu? Yookaan faallaa kanaatiin - sababa ariifattee ykn boqonnaa dhabdeef yeroo biraa caalaa dammaqina qabaachuu				
QABXII WALIIGALAA =				

MMAS-8	Yes	No
Yeroo tokko tokko qoricha fudhachuu ni dagattaa?		
Torban 2n darban keessa,guyyoonni qoricha keessan hin fudhanne jiraa?		
Yeroo fudhattu waan sitti hammaateef osoo doktora keetti hin himiin murtee beektaa?		
Yeroo imala ykn ykna baatu,yeroo tokko mana tokko qoricha kee fiduu ni dagattaa?		
Kaleessa qoricha kee hunda fudhattee?		
Mallattoon kee to'annaa jala akka jiru yommuu sitti dhaga'amu,yeroo tokko tokko qoricha kee fudhachuu ni dhiiftaa?		

Karoora wal'aansaa keessanitti cichuudhaan rakkinni sitti dhaga'amee beekaa?		
Yeroo meeqa qoricha kee hunda fudhachuu yaadachuuf walakkaa rakkatte? Gonkumaa?yeroo muraasa Yeroo tokko tokko Yeroo tokko tokko Yeroo hedduu Yeroo hundumaa		
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MMAS-8	Yes	No
አንዳንድ ጊዜ መድሃኒት መውሰድ ይረሳሉ?		
ባለፉት 2 ሳምንታት መድሃኒትዎን ያልወሰዱባቸው ቀናት አሉ?		
እርስዎ ሲወስዱት የባሰ ስሜት ስለነበረው ለሐኪምዎ ሳይናገሩ ውሳኔ ወስደዋል?		
ስትዳዝ ወይም ስትወጣ መድሀኒትህን ወደ ቤት ማምጣት ትረሳለህ?		
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ምልክቶችዎ በቁጥጥር ስር		

እንደሆኑ ሲሰማዎት አንዳንድ ጊዜ መድሃኒትዎን መውሰድ ያቆማሉ?		
ከህክምና እቅድዎ ጋር መጣበቅ ላይ ችግር አጋጥሞዎት ያውቃል?		
ሁሉንም መድሃኒቶችዎን ለመውሰድ ምን ያህል ጊዜ በግማሽ ያህል ታግለዋል? በጭራሽ? አልፎ አልፎ አንዳንዴ አንዳንዴ ብዙ ጊዜ ሁሌም		
Total		

ANNEX IV: INVESTIGATOR ASSURANCE FORM

I the undersigned nurse agree to accept all responsibilities for the scientific, ethical and technical conduct of the research project and for provision of required progress reports as per the terms and conditions of the Research and Publication Committee and /or Department of Internal Medicine, of Arsi University. I also assert that this proposal is my original work, has not been presented for a degree in any other university, and that all sources of materials used for the proposal have been accordingly acknowledged.

Name of Resident

Signature.....

Date.....

Approval of Advisors

1. Name of Advisor.....

Signature:

Date

2. Name of Advisor.....

Signature:

Date