

Research Article

# Adherence to Diabetic Self-Care Practice and Associated Factors Among Patients with Type Two Diabetes at a Public Hospital in Addis Ababa

Ali Seid Kolbay<sup>1</sup>, Mustofa Hassen Yesuf<sup>2</sup> , Getachew Mekete Diress<sup>3</sup> ,  
Abdurehman Seid Mohammed<sup>4,\*</sup> 

<sup>1</sup>Department of Advanced Adult Health Nursing, Saint Peter Specialized Hospital, Addis Ababa, Ethiopia

<sup>2</sup>Department of Internal Medicine, Saint Peter Specialized Hospital, Addis Ababa, Ethiopia

<sup>3</sup>Department of Anesthesia, College of Health Sciences, School of Medicine, Debre Tabor University, Debre Tabor, Ethiopia

<sup>4</sup>Department of Public Health, Saint Peter Specialized Hospital, Addis Ababa, Ethiopia

## Abstract

**Background:** Self-care adherence is thought to be crucial for managing polygenic disease. This is frequently because there is a strong correlation between poor blood sugar control and self-care behaviors and the subsequent emergence of polygenic disease complications. By improving glycemic control, patients may be able to reduce their risk of developing those complications. Therefore, the purpose of this study is to evaluate the self-care behaviors of patients with type II diabetes who are attending a selected public hospital in Addis Ababa City, as well as the impact of demographic factors and clinical state on these behaviors. **Methods:** An institution-based cross-sectional study design was conducted using SPSS version 26, and multivariable binary logistic regression analysis was used. **Result:** A total of 397 study participants were interviewed with response rate of 99.25%. Data coming from this study reveals that (73.8%) of study participants has good practiced on the recommended self-care practices. Factors found to be significantly associated with adherence to diabetic self-care were BMI of respondent (AOR = 0.465, 95% CI = 0.229-0.947), diabetic compilation, place of respondent (AOR = 1.090, 95% CI = 0.091-0.604), and monthly income (AOR =, 1.522 95% CI = 0.871-2.659). **Conclusion:** the level of adherence to self-care practices among diabetic patients is lower compared to other areas. To improve this, the healthcare team should adopt a patient-centered approach when deliver diabetes messages, focusing on specific issues related to management practice. it is imperative to increase awareness of patients and the community as a whole in order to address important aspects such as medication adherence, glycemic control and diet management. By taking these steps, we can work towards improving self-care practice among diabetic patients and ultimately, their overall health and well-being.

## Keywords

Adherence, Self-care, Self-care Practices, Diabetic Complications, Associated Factors, and Selected Public Hospital, Addis Ababa, Ethiopia

\*Corresponding author: Abduseid0824@gmail.com (Abdurehman Seid Mohammed)

**Received:** 15 November 2024; **Accepted:** 29 November 2024; **Published:** 16 December 2024





## 1. Introduction

The Middle Range Theory of Chronic Illness Self-Care the process of controlling disease and preserving health via health-promoting behaviors is known as self-care [1]. Conversely, adherence to self-care techniques is the collection of actions taken by individuals with or at risk for diabetes to effectively manage the condition independently [2]. People with diabetes who practice some critical self-care habits are more likely to have positive results. Healthy nutrition, regular exercise, blood sugar monitoring, medication compliance, effective problem-solving techniques, constructive coping mechanisms, and risk-reduction measures are some of these [3]. Strong and constant patient cooperation is necessary for diabetes management. Failure to follow self-care guidelines is frequently a major contributing factor to the difficulties that arise when managing diabetes. There are well-established and targeted self-care strategies to avoid and/or delay diabetes-related problems and the risk of premature death. The elements include self-checking blood sugar levels, controlling one's food, getting the most exercise possible, taking one or more medications as prescribed, and taking good care of one's feet [4, 5].

Adherence to self-care practices remains the mainstay management of polygenic disorder, because the majority of the malady management is done out by patients themselves or their families. According to earlier research, factors such as the early years of polygenic disorder, younger ages, educational status, participation in polygenic disorder education, country residence, male gender, lack of family support, comorbidities, inadequate information about polygenic disorder, and lack of a self-monitoring glucose meter were found to have an impact on polygenic disorder self-care practices [8].

Self-care adherence is thought to be crucial for managing polygenic disease. This is frequently because there is a strong correlation between poor blood sugar control and self-care behaviors and the subsequent emergence of polygenic disease complications. By improving glycemic control, patients may be able to reduce their risk of developing those complications [9]. The Centers for Medicare and Medicaid Services (CMS)-funded Informatics for Diabetes Education and Telemedicine (IDEA Tel) demonstration project assessed the viability, acceptability, and efficacy of a home telemedicine intervention in older adults with diabetes who are medically underserved and ethnically diverse. According to earlier studies, the intervention enhanced LDL cholesterol, blood pressure, and glycemic management when compared to standard care [10]. Therefore, the purpose of this study is to evaluate the self-care behaviors of patients with type II diabetes who are attending a selected public hospital in Addis Ababa City, as well as the impact of demographic factors and clinical state on these behaviors. Research on the degree of suggested self-care routines and the characteristics that are

linked to them in diabetic patients is still lacking, despite the advantages of practicing these practices. According to the North Carolina Behavioral Risk Factor Surveillance System, 83% of people with type 2 diabetes mellitus who participated in the survey monitored their blood sugar levels, and over 93% had seen a doctor for diabetes treatment within the previous 12 months. According on the nature of the activity, other studies have proposed that adherence to self-care practices varies greatly, with exercise typically falling short of prescribed levels and medicine usage frequently occurring as advised [14].

About 95% of diabetes management is often done by the affected person or their family, and adherence to self-care practices is essential to maintaining the illness under control [15]. The main factor contributing to the development of diabetes complications and the resulting personal, societal, and financial consequences is inadequate adherence to established standards of care. Even more concerning is the situation in poorer nations, where a far smaller percentage of individuals have their diabetes under control [7]. Compared to individuals who neglected self-care, the subjects who practiced self-care showed improved metabolic regulation [32].

## 2. Methods

### 2.1. Study Area and Period

Ethiopia's capital, Addis Ababa, served as the study's location. In 1889, Addis Ababa was founded and is about 2,300 meters above sea level. The study focused on diabetic follow-up clinics located at Saint Peter Specialized Hospital and St. Paul's Hospital Millennium Medical College. There are roughly 33 hospitals in Addis Ababa, including 20 private, 6 public, 1 NGO, and 2 owned by other companies. According to information gathered from these public hospitals' internal medicine departments, they provide diabetes follow-up services to their patients.

With an expected monthly flow of 1000 Type II diabetes patients, the hospital's Chronic Follow-Up Unit is one of its specialized units and could serve as a referral clinic for all diabetic patients from every catchment region. This chronic follow-up unit was selected for my study for more reasons than just the fact that it is currently the biggest diabetic center in the city or even the country. This made it possible to obtain sufficient samples for my research within a constrained time frame for gathering data. The study was carried out from February through May of 2023.

### 2.2. Study Design

A prospective cross-sectional study was conducted among patients with type II diabetes mellitus attending the outpatient



department of diabetic follow up unit in selected public hospitals of Addis Ababa city.

## 2.3. Study Population

The study population was all type II diabetic patients on follow up unit in selected public hospitals of Addis Ababa at the time of data collection period and fulfilling the inclusion criteria.

## 2.4. Eligibility Criteria

### 2.4.1. Inclusion Criteria

Age greater than 18 years  
Diagnosed with type II diabetes and made follow up for at least three months and consent was obtained.

### 2.4.2. Exclusion Criteria

Those unable to respond to the questions due to altered mental states, mentally unstable.

## 2.5. Sample size determination

The sample size for the study determined by assuming 5% marginal error, 95% CI and 45% proportion of DM self-care

practice [16]. A sample was calculated based on the assumption of single population proportion formula,

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

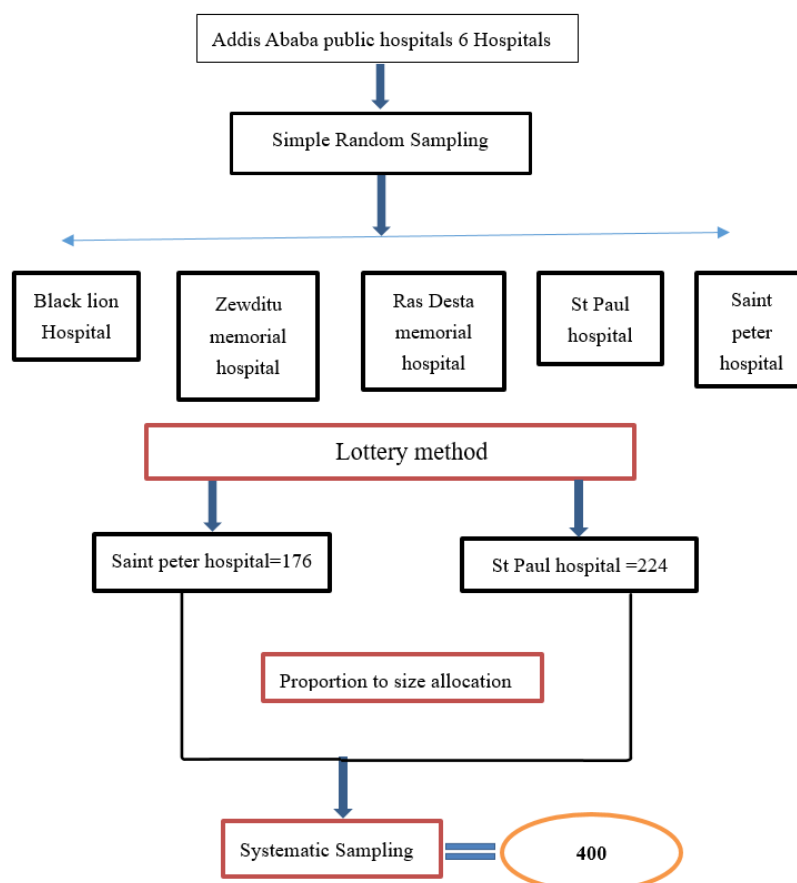
Where: n- Minimum sample size, P- proportion of DM good self-care practice (45%) d-the margin of sampling error tolerated (5%)  $Z\alpha/2$ -is the standard normal distribution at 1- $\alpha\%$  confidence level (95%=1.96).

$$n_0 = \frac{(Z\alpha/2)^2 P(1-P)}{d^2} = \frac{(1.96)^2 * 0.45 * 0.55}{(0.05)^2} = 380$$

The final sample size including 5% non-response rate become 400 DM patients

## 2.6. Data Collection Procedure

Two of the six public hospitals in Addis Ababa that provide diabetic follow-up care were chosen through the use of the simple random selection (lottery) method. These hospitals were chosen by lottery, and the number of study units was chosen by allocating the sample size proportionately to each institution. Patients' information will be gathered using a simple random sampling method. The sampling process is described below.



**Figure 1.** Schematic representation of sampling procedure at selected public hospital Addis Ababa, Ethiopia; 2023.



## 2.7. Study Variable

### 2.7.1. Independent Variables

Socio-demographic: Age of the patient, Marital states, Sex (male, female), Education level (no education, primary, secondary, diploma and above), Place of Residency (urban, rural), Income of the patient and Occupation (governmental, non-governmental, no job).

Clinical factors: Blood glucose, Diabetes complication, presence of comorbidity, MI (18.5-24.9, 25-30, >30), Duration of illness, Treatment modality (insulin, Oral anti glyceemic).

Self -care practices; Number of visit (every one month, every three months, every six month); Attending health education (no, yes).

### 2.7.2. Dependent Variable

Adherence to Self-care practices

## 2.8. Operational Definitions

- 1) Adherence to self-care practice: It is a daily regimen task that the individual patients were performed to manage diabetes on their behalf (dietary practice, exercise, medication, daily foot care, monitoring blood glucose). Diabetes self-care practice was assessed by participants' responses to the 13- item Summary of Diabetes Self-Care Activities in the last 7 days. Response choices for each question were range from 0 to 7 based on the number of days on which the indicated behavior was performed. The overall mean score was estimated by summation of each item of the scale and divided by the total number of questions. Therefore, after calculating the overall mean score, participants who scored equal to or greater than the mean score were classified as having good diabetes self-care practice and those who scored below the mean were considered as having poor self-care practice [48].
- 2) Self-care practice: is defined as activities that individuals initiate and perform on their own behalf in maintaining life, health, and well- being.
- 3) Physical activity: is the minimum physical activity level was determined as 30 minutes moderate activity for at least 3 days per week
- 4) Foot Care: Good foot monitoring/care should be on a daily basis, Adherence to the proper care of the foot, including nail and skin care, and the selection of appropriate footwear daily.
- 5) Adherence with dietary regimen was graded as: good adherence was recorded when the patient strictly followed the prescribed dietary regimen and poor-adherence when he/she did not follow the regimen at all or follow for less than 3 days per week.
- 6) Adherence with anti-diabetic drugs was assessed by the extent of adherence of the diabetic patients to the prescribed doses of medications.

- 7) Adherence with Self-measurement of blood glucose: Responses was rated on a 6-point scale (twice a day, daily, every other day, twice a week, once a week, or never).

Good self-care practice Respondents were "good self-care" for those whom computed mean of variables fewer than five components of self-care practice fall in the range of 4-7 day except for medication adherence (All 7 days needed for medication adherence).

Poor self-care practice: Respondents were "poor self-care" for those whom computed mean of variables fewer than five components of self-care practice fall in the range of 0-3 day except for medication adherence (0-6 days for medication adherence).

The total score of each item of the questionnaire will calculate out of 100. Considering to the total score, the level of self-care practice was classified into: Poor adhered (<49%), Good Adhered (50% and above). this scoring method is adopted from previously done research [49, 50].

## 2.9. Data Collection Tools

Interviewer administered structured questionnaire data collection tool was used, it has three-part, part 1 socio-demographic variable, part 2 clinical factor and part 3 diabetic self- care practices is the original SDSCA, which was used to measure five areas or domains of diabetes self-care practices: general diet, specific diet, exercise, medication, and self-blood glucose monitoring. Beside to this the revised SDSCA also it contains items on foot care and smoking. The SDSCA questioner was adopted contextually and its reliability and validity already tested in U.S.A among similar study subjects [48].

Pre-test: The questionnaire was pre-tested prior to the actual data collection on 5 respondents in the study area and the respondents were excluded from the actual study.

### 2.10. Data Collection Procedure

Structured interviewer administered questionnaire was used to collect data on adherence to diabetic self-care practice and its associated factors. All the questions are prepared in English and were translated to the language of Amharic by experts" who are fluent by both language and back translated to English to see its consistency.

### 2.11. Data Quality Assurance

Both the data collectors and supervisors were trained for half day on the objective and methodology of the research, data collection approach. The questionnaire was translated to Amharic language and back translated into English by another person to check for consistency. Pretest was conducted in 10% of the samples in a health care institution that was included in the survey to see the completeness, consistency, and applicability of the instruments and was ratify accordingly. A survey



procedure was designed to protect the patient's privacy by allowing for anonymous and voluntary participation.

## 2.12. Ethics Approval and Consent to Participate

Ethical clearance was obtained from the Institutional Review Committee of the Saint Peter Specialized Hospital. A formal letter was submitted to the Black Lion Hospital, St Paul Hospital, Zewditu Memorial Hospital, Ras Desta Memorial Hospital, Gandhi Memorial Hospital, and Saint Peter Hospital administrative to get permission. Written informed consent and oral consent were obtained from each study participant according to the principles of the Helsinki Declaration. The Declaration of Helsinki was considered and principles and recommendations have been used.

### Consent for publication

"Written informed consent was obtained from the patient for publication of this study and accompanying images".

## 3. Results

### 3.1. Sociodemographic and Baseline Characteristics

Three respondents were excluded from the analysis for gross incompleteness and inconsistency of responses, making a response rate of 99.25 %. Of all respondents, 232(58.5%) females' and 277(69.3%) married. The mean age of the respondents was  $51.76 \pm 13.063$  years [(95% CI) (45—81)]. See the detail description on (Table 1).

**Table 1.** Socio-Demographic Characteristics of the Study Participants at a public hospital in Addis Ababa, Ethiopia, 2023 (N=397).

Variables	Variables categories	Frequency (n=397)	Percentage (%)
Age (years)	18-44	116	29.22
	45-54	94	23.68
	>55	187	47.1
Sex	Male	165	41.6
	Female	232	58.4
Place of residence	Urban	371	93.5
	Rural	26	6.5
Marital Status	Married	277	69.8
	Divorced	35	8.8
	Widowed	58	14.6
	Single	27	6.8
Educational level	Unable to read and Write	57	14.4
	Read and write	49	12.3
	Primary	69	17.4
	Secondary	83	20.9
	Diploma	67	16.9
	Degree and above	72	18.1
Occupation	Governmental Employee	123	31.0
	Non-governmental employee	7	1.8
	Self-employee	167	42.1
	Farmer	6	1.5
	Student	8	2
	Other	86	21.7
Distance in km from home	2-6km	299	75.3



Variables	Variables categories	Frequency (n=397)	Percentage (%)
to hospital	above 6km	98	24.7
	Very low income	26	6.5
Monthly income (ETB)	Low income	169	42.6
	average	93	23.4
	higher	109	27.5

Note: Others\* include homemakers and unemployed. Abbreviation: ETB, Ethiopian birr

### 3.2. Clinical Characteristics of Study Participants

From the total respondents of 363(90.8%) were types 2 DM

and more than half 257(64.3%) of the participants were currently on oral hypoglycemic agents. Nearly half of the respondents (49.3%) had no family history of DM. See the detail description as shown in (Table 2).

**Table 2.** Clinical Characteristics of the Study Participants at a public hospital in Addis Ababa, Ethiopia, 2023 (N=397).

Variables	Variables categories	Frequency	Percentage (%)
Type of DM	Type I DM	37	9.3
	Type II DM	360	90.7
What medication are currently you taking	No medication	2	.5
	Insulin only	36	9.0
	Oral hypoglycemic Agent +insulin	105	26.3
Comorbidity	The oral hypoglycemic agent only	257	64.3
	Yes	221	55.7
	no	176	44.3
Family history of DM	Yes	171	42.8
	no	197	49.3
Glucometer at home	YES	216	54.4
	NO	181	45.6
Glycemic control	Good controlled blood glucose	115	29.0
	poor controlled blood glucose	282	71.0
BMI of respondent	Underweight	8	2.0
	Normal range	137	34.5
	Overweight	141	35.5
Complications	Obese	111	28.0
	No complication	297	74.8
	Complication	100	25.2
Duration of diabetes in the year	< 1year	49	12.3
	2-5years	124	31.2
	> 6 years	224	56.4



Variables	Variables categories	Frequency	Percentage (%)
What was your age during diagnosis in a year	<29	20	5.0
	30-40	211	53.1
	>41	166	41.8

### 3.3. Adherence to Self-Care

The majority (96.8%) of the respondents had self-care practice of taking recommended medication, more than half (54.5%) had poor self-care practice of regular physical activ-

ity over 30 minutes less than three days, and 212 (53%) of respondents reported they checked their feet every day and 229(57%) had poor healthful eating plan. The overall mean score for self-care among the study participants was 1.47 (SD  $\pm 0.174$ ). Overall, 283(73.8%) of participants had good self-care practices. See the detail description on (Table 3).

**Table 3.** Diabetic Self-Care Practice among Diabetes Mellitus Patients at a public hospital in Addis Ababa, Ethiopia, 2023.

Variables	Self-Care Practice	Frequency	(%)
On how many of the last seven days do you participate in at least 30 minutes of physical activity?	Poor	188	47.4
	Good	209	52.6
On how many of the last 7 days, did you take your diabetes medication?	Poor	25	6.3
	Good	372	93.7
On how many of the last seven days did you check your feet	Poor feet check practice	120	30.2
	Good feet check practice	277	69.8
How many of the last 7 days have you followed a healthful eating plan?	Poor healthful eating plan	226	56.9
	Good healthful eating plan	171	43.1
On how many of the last seven day did you take your recommended insulin injections drugs	Poor insulin injections practices	235	59.2
	Good insulin injections practice	162	40.8
On how many of the last seven days did you eat fruits and vegetables?	Poor	108	27.2
	Good	289	72.8
did you space carbohydrates evenly through the day 7days	Good carbohydrates practices	119	30.0
	Poor carbohydrates practices	278	70.0
How many of the last seven days did you eat high-fat foods dairy products?	Poor	193	48.6
	Good	204	51.4
Have you drink alcohol in the last seven days	Poor	395	99.5
	Good	2	.5
Blood sugar test with in the number of times recommended by your health care provider?	Poor	246	62.0
	Good	151	38.0
Have you smoked a cigarette even a puff in past seven days	Good	396	99.7
	poor	1	0.3
Do you come on the day of appointment	Never smoked	356	89.7
	Once to two years	41	10.3
When did you last smoke a cigarette	Never smoked	390	97.8



Variables	Self-Care Practice	Frequency	(%)
Over all diabetic self-care practice	Once to two years	7	1.8
	Poor adherence to diabetic s	104	26.2
	Good adherence to diabetic self-care	293	73.8

### 3.4. Factors Associated with Adherence to Self-care Practice

In the multivariable logistic regression analysis, place of residency, Monthly income and Diabetes complication status of study subjects were found to have a statistically significant association with adherence to diabetic self-care practice. Patients who are monthly income average were about 1.23

times more likely to have better adherence to diabetic self-care practice than higher income [AOR] [95% CI] =1.23 [0.626-2.688]]. Respondents who had body mass index at normal range were 54% less to adhere to diabetic self-care practice than those who had body mass index value range obese (Table 4). Respondents within the age group of 18–44 years were 2 times more likely to be adhered to their prescribed ant-diabetic medications compared with those age greater than 55years, (AOR [95% CI] =2 [519-7.401]).

**Table 4.** Factors Associated with Diabetic Self-Care Practice among DM Patients at a public hospital in Addis Ababa, Ethiopia, 2023 (N=397).

Variables	Self-Care Practice		COR (95% CI)	AOR (95% )
	Poor (%)	Good N (%)		
place of residency				
urban	89(24.0%)	282(76.0%)	0.231(0.103-0.522)	1.090 (.091-.604) *
rural	15(57.7%)	11(42.3)	1.00	1.00
Diabetes complication				
No complication	57(19%)	243(81%)	.264 (0.164-0.436)	.289 (.163-.512) *
Complication	47(47%)	53(53%)	1.00	1.00
comorbidity				
Yes	50(22.3%)	174(77.7%)	.649(.421-1.035)	1.086 (.639-1.846)
No	54(30.7%)	122(69.3%)	1.00	1.00
BMI of respondent				
Underweight	3(37.5%)	5(62.5%)	1.749(.397-7.696)	2.027 (.353-11.621)
Normal range	35(25.5%)	102(74.5%)	0.756(.303-5.782)	0.465(0.229-0.947) *
Overweight	44(31.2%)	97(68.8%)	2.427(.539-10.938)	1.870 (.971-3.603)
Obese	22(19.8%)	89(80.2%)	1.00	1.00
Fast blood sugar				
Poor controlled	24(19.7%)	98(80.3%)	0.597 (.894-2.523)	1.228(0.671-2.246)
Good controlled	80(29.1%)	195(70.9)	1.00	1.00
Monthly income				
Very low	6(23.1%)	20(76.9%)	1.174(0.486-3.611)	0.57(0.164-1.975)
Low income	35(20.3%)	137(79.7%)	1.522(0.871-2.659)	0.465(0.229-0.947) *
Average	32(34.4%)	61(65.6%)	.758(.417 1.376)	1.297(0.626-2.688)



Variables	Self-Care Practice		COR (95% CI)	AOR (95% )
	Poor (%)	Good N (%)		
Higher	31(28.4%)	78(71.6%)	1.00	1.00
Type of DM				
Type 1	7(18.9%)	30(81.1%)	0.632 (0.13–3.36)	0.27 (0.09–0.79) *
Type 2	97(26.9%)	263(73.1%)	1.00	1.00

NB: OHA stands for oral hypoglycemic agent, Note: \*statistically significant at  $P < 0.05$

### 3.5. Adherence to Overall Self-care Practices Summary of Diabetes Self-Care Activities (SDSCA)

#### 3.5.1. Adherence to Exercise

The results of exercise showed that 209 (52.6%) [95% CI] of the study subjects good adhered to physical exercise, which means they were performed at least 30–60 minutes of moderate aerobic activity per day or \$3 days per week.

#### 3.5.2. Adherence to Prescribed Medications

A total of 372 (93.7%) [95% CI] of respondents were reported that they good adhered to their medications, whereas only 25(6.3%) [95% CI] of the respondents did not adhere to the prescribed anti-diabetic medications. Majority of the study participants, 36 (9.1%), [95% CI] were taking insulin, 257 (64.7%) [95% CI] of them were taking oral hypoglycemic agents, and 103 (25.9%) [95% CI] of participants taking both.

##### *Adherence to dietary management*

The majority, 235 (56.9%), [95% CI] of the study participants did not adhere to recommended dietary management practices.

#### 3.5.3. Adherence to Self-Measuring of Blood Glucose (SMBG)

The majority, 246 (62%), [95% CI] of the study participants did not adhere to SMBG, which means they monitored their blood glucose levels, 1–2 times per week; only 151 (38%) patients adhered, meaning they monitored their blood glucose at least 3–4 times a week.

## 4. Discussion

Overall, in this study 73.8% of the respondent had good and 26.2% poor diabetic adherence to self-care practice. This showed that presence of problem in diabetic patients concerning to diabetic adherence to self-care practice that needs immediate attention by the concerned bodies. The finding of this study overall adherence to diabetic self-care practice in line

with study conducted in DILLA university referral hospital, South Ethiopia where 76.8% of respondents' had adherence to good self-care practice [51]. From different study findings, the diabetes self-care practice adherence is not consistent. The overall good adherence to diabetic self-care practice of participants in this study (73.8%) lower than the study done in DILLA university hospital (76.8%), Nigeria (80.3%) (28), and Qatar (88.9%) [52] but higher than the study conducted in Harari town, Eastern Ethiopia {(39.2% [39])}, public hospitals of Tigray region central zone {(37.3%) [42]} and Dessie referral hospital, Northeast Ethiopia {(55.8%) [38]}.

The variation might be due to the presence of difference in health care accessibility within the country and short consultation time during first diagnosis and follow up might discourage patients from attending their follow ups and accessing the required information regarding self-care practices and also this might be due to differences in the source population, socio-economic and cultural difference, level of health educational status in which more than half of the study participants were with lower educational status. Although adequate diabetes self-care practice can be achieved through patient centered education, health professionals might fail to devote adequate time for discussion to educate and motivate patients to follow the recommended diabetes self-care practice due to high number of patients in the facilities.

The findings of this study showed that place of residency, type's complication, and monthly income were found to be significantly statistical associated with diabetes self-care practice adherence in multivariate regression model analysis. This might be due to the fact that those who have live residence might have gained more information how to perform diabetic self-care activities.

## 5. Strengths and Limitations of the study

### *Strengths*

High response rate

### *Limitations of the study*

- 1) Social desirability bias due to sensitive and personal question related to diabetic self-care especially about financial issues.
- 2) Self-report rather than direct observation of patients of



self-care practices and Use of mean fasting blood sugar rather than glycosylated hemoglobin to determine the level of glycemic control.

## 6. Conclusion and Recommendation

### 6.1. Conclusion

This study identified gaps in adherence to diabetic self-care practices of diabetic patients attending Addis Ababa selected public hospital. As adherence to diabetic self-care is crucial in diabetes to keep the illness under control because 95% self-care is usually provided by the ill persons or their families in order to prevent or minimize complications related to the disease, this study recognized that large proportion of patients had much lower than the recommended self-care practices domains. In this finding respondents' place of residency, have complication, and monthly income are independent predictors of adherence to diabetic self-care practice.

### 6.2. Recommendation

Hence Interventions aiming at improving diabetes control should be multifaceted and should involve more effective measures of awareness creation on the importance of the self-care practice and more frequent clinic visits. Saint peter specialized hospital and Saint Paul hospital millennium medical college should reinforce the diabetic patients on follow up and health professionals working in diabetic clinic to improve their knowledge on diabetes and its adherence to diabetic self-care.

Prepare routine health information dissemination and should be given by trained and experienced health professional by considering the patients place of residency, have complication, and monthly income. All nurses' workings on diabetes should give strict advice on importance of self-care practices for diabetic patients during their follow up schedule and develop educational programs and activities to educate patients on the prevention and treatment of diabetes, and should not rely on medical intervention only. To researcher, further study should look into the sustainability of the adherence to diabetic self-care practice and its effect on diabetic related morbidity.

## Abbreviations

AAHB	Addis Ababa Health Bureau
ADA	America Diabetic Association
AIDS	Acquired Immunodeficiency Syndrome
AOR	Odds Ratio
COR	Crud Odds Ratio
DM	Diabetic Mellitus
FBS	Fasting Blood Sugar
FPG	Fasting Plasma Glucose

HIV	Human Immune Deficiency Virus
IDA	International Diabetic Association
IDDM	Insulin Dependent Diabetic Mellitus
IDF	International Diabetic Foundation
LMICS	Low- and Middle-Income Country
NIDDM	None Insulin Dependent Diabetic Mellitus
OHA	Oral Hypoglycemic Agent
PI	Principal Investigator
SMBG	Self-Measuring of Blood Glucose
SDSCA	Summary of Diabetes Self-Care Activities
WHO	World Health Organization

## Declarations

No conflict of interest between Authors.

## Ethics approval and consent

Ethical clearance was obtained from obtained from the institutional Review committee of saint peter specialized hospital. A Formal letter will be submitted to each hospital IRB and permission will be assured to keep the confidentiality. Strict Confidentiality was maintained by omitting. Utilizing non-identifiable data and only allowing authorized personnel to access it. Respecting institutional and national guidelines, the study did not affect participants, protecting patient confidentiality and quality of care. There were no repercussions or extra hazards for participants because of the research design.

## Availability of Data and Materials

The corresponding author can provide the datasets used and analyzed in this study upon reasonable request.

## Author Contributions

Ali Seid kolbay: designed the study, writing, conceived and review and editing original draft, formulated the study design, data quality check, performed statistical analysis, and drafted initial manuscript.

Abdurehman Seid Mohammed: conceived and designed the study, writing review and editing original draft, formulated the study design, data quality check, performed statistical analysis, and drafted initial manuscript.

Getachew Mekete Diress contributed to the literature review, conceptualization, statistical analysis, and manuscript revision.

Mustofa Hassen Yesuf and Abdurehman Seid Mohammed: contributed to the conceptualization and research design, review and edit of original document, and revised the manuscript. Abdurehman seid and Getachew Mekete contributed to the conception, revised data extraction sheet, collected patient data, reviewed, and interpreted the data, and revised the manuscript.



## Funding

No grant from a public, private, or nonprofit organization was given for this research.

## Conflicts of Interest

The writers claim to have no conflicting agendas.

## References

- [1] Riegel B, Dunbar SB, Fitzsimons D, Freedland KE, Lee CS, Middleton S, et al. Self-care research: Where are we now? Where are we going? *International journal of nursing studies*. 2021; 116: 103402.
- [2] Selvaraj K, Ramaswamy G, Radhakrishnan S, Thekkur P, Chinnakali P, Roy G. Self-care practices among diabetes patients registered in a chronic disease clinic in Puducherry, South India. *Journal of Social Health and Diabetes*. 2016; 4(01): 025-9.
- [3] Kinra S, Bowen LJ, Lyngdoh T, Prabhakaran D, Reddy KS, Ramakrishnan L, et al. Sociodemographic patterning of non-communicable disease risk factors in rural India: a cross sectional study. *Bmj*. 2010; 341.
- [4] Weijman I, Ros WJ, Rutten GE, Schaufeli WB, Schabracq MJ, Winnubst JAJPe, et al. The role of work-related and personal factors in diabetes self-management. 2005; 59(1): 87-96.
- [5] Bongor Z, Shiferaw S, Tariku EZ. Adherence to diabetic self-care practices and its associated factors among patients with type 2 diabetes in Addis Ababa, Ethiopia. *Patient preference and adherence*. 2018; 12: 963.
- [6] Barceló A, Rajpathak S. Incidence and prevalence of diabetes mellitus in the Americas. *Revista Panamericana de Salud Pública*. 2001; 10(5): 300-8.
- [7] Mercer T, Chang AC, Fischer L, Gardner A, Kerubo I, Tran DN, et al. Mitigating the burden of diabetes in Sub-Saharan Africa through an integrated diagonal health systems approach. 2019; 12: 2261.
- [8] Molalign Takele G, Weharei MA, Kidanu HTM, Gebrekidan KG, Gebregiorgis BG. Diabetes self-care practice and associated factors among type 2 diabetic patients in public hospitals of Tigray regional state, Ethiopia: A multicenter study. *Plos one*. 2021; 16(4): e0250462.
- [9] Knecht MC, Keinänen-Kiukaanniemi SM, Knuuttila ML, Syrjäälä AMHJJoCP. Self-esteem as a characteristic of adherence to diabetes and dental self-care regimens. 2001; 28(2): 175-80.
- [10] Trief PM, Izquierdo R, Eimicke JP, Teresi JA, Golan R, Palmas W, et al. Adherence to diabetes self-care for white, African-American and Hispanic American telemedicine participants: 5 year results from the IDEATel project. *Ethnicity & Health*. 2013; 18(1): 83-96.
- [11] Bovet P, Burnier M, Madeleine G, Waeber B, Paccaud F. Monitoring one-year compliance to antihypertension medication in the Seychelles. *Bulletin of the world health organization*. 2002; 80: 33-9.
- [12] Liebl A, Neiss A, Spannheimer A, Reitberger U, Wieseler B, Stammer H, et al. Complications, co-morbidity, and blood glucose control in type 2 diabetes mellitus patients in Germany-results from the CODE-2TM study. *Experimental and clinical endocrinology & diabetes*. 2002; 110(01): 10-6.
- [13] van der Sande MA, Milligan P, Nyan O, Rowley J, Banya W, Ceesay S, et al. Blood pressure patterns and cardiovascular risk factors in rural and urban Gambian communities. *Journal of human hypertension*. 2000; 14(8): 489-96.
- [14] Organization WH. Self-care in the context of primary health care. WHO Regional Office for South-East Asia; 2009.
- [15] Anderson RM, Funnell MM, Butler PM, Arnold MS, Fitzgerald JT, Feste CC. Patient empowerment: results of a randomized controlled trial. *Diabetes care*. 1995; 18(7): 943-9.
- [16] Hailu E, Mariam WH, Belachew T, Birhanu Z. Self-care practice and glycaemic control amongst adults with diabetes at the Jimma University Specialized Hospital in south-west Ethiopia: A cross-sectional study. *African Journal of Primary Health Care and Family Medicine*. 2012; 4(1): 1-6.
- [17] Sharifi T, Javan-Noughabi J, Asadi Z, Zarqi MJBHSR. Reasons for non-participation in a self-care training program for diabetic patients: a qualitative study. 2022; 22(1): 1-9.
- [18] Association AD. Standards of medical care in diabetes—2019 abridged for primary care providers. *Clinical diabetes: a publication of the American Diabetes Association*. 2019; 37(1): 11.
- [19] Cho N, Shaw J, Karuranga S, Huang Y, da Rocha Fernandes J, Ohlrogge A, et al. IDF Diabetes Atlas: Global estimates of diabetes prevalence for 2017 and projections for 2045. *Diabetes research and clinical practice*. 2018; 138: 271-81.
- [20] Costa FF, Rosário WR, Farias ACR, de Souza RG, Gondim RSD, Barroso WA. Metabolic syndrome and COVID-19: An update on the associated comorbidities and proposed therapies. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*. 2020; 14(5): 809-14.
- [21] Jaffiol C. The burden of diabetes in Africa: a major public health problem. *Bulletin de l'Académie nationale de médecine*. 2011; 195(6): 1239-53; discussion 53.
- [22] Roglic G. WHO Global report on diabetes: A summary. *International Journal of Noncommunicable Diseases*. 2016; 1(1): 3.
- [23] Amente T, Belachew T, Hailu E, Berhanu N. Self care practice and its predictors among adults with diabetes mellitus on follow up at Nekemte hospital diabetic clinic, West Ethiopia. *World J Med Med Sci*. 2014; 2(3): 1-16.
- [24] Vandenbosch J, Van den Broucke S, Schinckus L, Schwarz P, Doyle G, Pelikan J, et al. The impact of health literacy on diabetes self-management education. *Health education journal*. 2018; 77(3): 349-62.



- [25] Dedefo MG, Ejeta BM, Wakjira GB, Mekonen GF, Labata BG. Self-care practices regarding diabetes among diabetic patients in West Ethiopia. *BMC research notes*. 2019; 12(1): 1-7.
- [26] Basu S, Garg S, Sharma N, Singh MM, Garg S. Adherence to self-care practices, glycemic status and influencing factors in diabetes patients in a tertiary care hospital in Delhi. *World journal of diabetes*. 2018; 9(5): 72.
- [27] Rajasekharan D, Kulkarni V, Unnikrishnan B, Kumar N, Holla R, Thapar RJAom, et al. Self care activities among patients with diabetes attending a tertiary care hospital in Mangalore Karnataka, India. 2015; 5(1): 59-64.
- [28] Kassahun T, Gesesew H, Mwanri L, Eshetie TJBed. Diabetes related knowledge, self-care behaviours and adherence to medications among diabetic patients in Southwest Ethiopia: a cross-sectional survey. 2016; 16(1): 1-11.
- [29] Abebaw M, Messele A, Hailu M, Zewdu FJAin. Adherence and associated factors towards antidiabetic medication among type II diabetic patients on follow-up at University of Gondar Hospital, Northwest Ethiopia. 2016; 2016.
- [30] Alhariri A, Daud F, Almainan A, Saghir SJL. Factors associated with adherence to diet and exercise among type 2 diabetes patients in Hodeidah city, Yemen. 2017; 7(3): 264-71.
- [31] Saleh F, Mumu SJ, Ara F, Hafez MA, Ali L. Non-adherence to self-care practices & medication and health related quality of life among patients with type 2 diabetes: a cross-sectional study. *BMC public health*. 2014; 14(1): 1-8.
- [32] Toljamo M, Hentinen M. Adherence to self - care and glycaemic control among people with insulin - dependent diabetes mellitus. *Journal of advanced nursing*. 2001; 34(6): 780-6.
- [33] Mogre V, Johnson NA, Tzelepis F, Shaw JE, Paul C. A systematic review of adherence to diabetes self - care behaviours: Evidence from low - and middle - income countries. *Journal of Advanced Nursing*. 2019; 75(12): 3374-89.
- [34] Mutyambizi C, Pavlova M, Hongoro C, Groot W. Inequalities and factors associated with adherence to diabetes self-care practices amongst patients at two public hospitals in Gauteng, South Africa. *BMC Endocrine Disorders*. 2020; 20(1): 1-10.
- [35] Danquah I, Bedu-Addo G, Terpe K-J, Micah F, Amoako YA, Awuku YA, et al. Diabetes mellitus type 2 in urban Ghana: characteristics and associated factors. *BMC public health*. 2012; 12(1): 1-8.
- [36] Mohamed SF, Mwangi M, Mutua MK, Kibachio J, Hussein A, Ndegwa Z, et al. Prevalence and factors associated with pre-diabetes and diabetes mellitus in Kenya: results from a national survey. *BMC public health*. 2018; 18(3): 1-11.
- [37] Abate TW, Tareke M, Tirfie MJBBrn. Self-care practices and associated factors among diabetes patients attending the outpatient department in Bahir Dar, Northwest Ethiopia. 2018; 11(1): 1-5.
- [38] Gebre SZ, Zegeye B, Taderegew MMJJomH. Self-Care Practice and Associated Factors Among Individuals with Diabetes Mellitus in Northeast Ethiopia. 2020; 13: 1817.
- [39] Ayele K, Tesfa B, Abebe L, Tilahun T, Girma EJPo. Self care behavior among patients with diabetes in Harari, Eastern Ethiopia: the health belief model perspective. 2012; 7(4): e35515.
- [40] Zhou Y, Liao L, Sun M, He GJE, medicine t. Self-care practices of Chinese individuals with diabetes. 2013; 5(4): 1137-42.
- [41] Afaya RA, Bam V, Azongo TB, Afaya A, Kusi-Amponsah A, Ajusiye JM, et al. Medication adherence and self-care behaviours among patients with type 2 diabetes mellitus in Ghana. *PloS one*. 2020; 15(8): e0237710.
- [42] Mariye T, Tasew H, Teklay G, Gerense H, Daba W. Magnitude of diabetes self-care practice and associated factors among type two adult diabetic patients following at public Hospitals in central zone, Tigray Region, Ethiopia, 2017. *BMC research notes*. 2018; 11(1): 1-6.
- [43] O'Neil KJ, Jonnalagadda SS, Hopkins BL, Kicklighter JR. Quality of life and diabetes knowledge of young persons with type 1 diabetes: influence of treatment modalities and demographics. *Journal of the American Dietetic Association*. 2005; 105(1): 85-91.
- [44] Adisa R, Fakeye T, Okorie LJEPJ. Knowledge, attitude and self-management practices of patients with type 2 diabetes in an ambulatory care setting in Ibadan, Nigeria. 2010; 28(2): 143-53.
- [45] Guo H, He H, Jiang J. Study on the compliance of antihypertensive drugs in patients with hypertension. *Zhonghua liu xing bing xue za zhi= Zhonghua liuxingbingxue zazhi*. 2001; 22(6): 418-20.
- [46] Khangura D, Kurukulasuriya LR, Whaley-Connell A, Sowers JR. Diabetes and hypertension: clinical update. *American Journal of Hypertension*. 2018; 31(5): 515-21.
- [47] Weledegebriel M, Mulugeta A, Hailu AJD, Metabolic Syndrome, Targets O, Therapy. Evaluation of Self-Care Practice and Its Associated Factors in Adult Diabetic Patients, Ayder Diabetic Clinic, Mekelle, Ethiopia. 2021; 14: 2239.
- [48] Toobert DJ, Hampson SE, Glasgow REJDc. The summary of diabetes self-care activities measure: results from 7 studies and a revised scale. 2000; 23(7): 943-50.
- [49] Al-Kaabi J, Al-Maskari F, Afandi B, Parkar H, Nagelkerke N. Physical activity and reported barriers to activity among type 2 diabetic patients in the United Arab Emirates. *The review of diabetic studies: RDS*. 2009; 6(4): 271.
- [50] Navaratne J, Fonseka P. Knowledge and self care practices of diabetic patients on oral hypoglycaemic drugs attending the Medical Clinics, Teaching Hospital Karapitiya. *Galle Medical Journal*. 2000; 2(1): 54-9.
- [51] Addisu Y, Eshete A, Hailu EJJMS. Assessment of diabetic patient perception on diabetic disease and self-care practice in Dilla University Referral Hospital, South Ethiopia. 2014; 3(166): 2167-0943.1000166.
- [52] Jaam M, Ibrahim MIM, Kheir N, Hadi MA, Diab MI, Awaisu AJPcd. Assessing prevalence of and barriers to medication adherence in patients with uncontrolled diabetes attending primary healthcare clinics in Qatar. 2018; 12(2): 116-25.