Journal of
Endocrinology and Thyroid Research
ISSN: 2573-2188

Juniper Publishers
key to the Researchers

Research Article
Volume 6 Issue 3 - October 2021
DOI: 10.19080/JETR.2021.06.555687

J Endocrinol Thyroid Res

Adherence to Insulin and Associated Factors Among Diabetic Patients Attending Chronic Follow Up Clinic of Jimma University Medical Center, Southwest Ethiopia, 2021

Ismael Ahmed*, Kidist Asrat and Tigist Serawit

School of Nursing and Midwifery, Jimma University, Ethiopia

Submission: July 22, 2021; **Published:** October 12, 2021

***Corresponding author:** Ismael Ahmed, School of Nursing and Midwifery, Jimma University, Ethiopia

Abstract

Background: Diabetic mellitus affects around 351.7 million people of reproductive age worldwide. Studies conducted in developing countries shows higher rate of non-adherence to insulin. Adherence to insulin is critical for diabetic patient so far, the issue of adherence still considered as secondary treatment gap and the most important cause of poorly controlled diabetic mellitus particularly in developing countries.

Objective: To assess adherence to insulin and associated factors among diabetic patients' attending chronic follow up clinic of Jimma university medical center, southwest Ethiopia 2021.

Methods and Materials: Institutional based cross-sectional study design was conducted from November-01/11/2020-December-15/12/2020. Structured interviewer administered questionnaire was used to collect data and patient's medical record was reviewed using data extraction checklist. Consecutive sampling technique was used to select study participants. Descriptive statistics was used to describe the data. Data was entered and analyzed using SPSS version 23. Chi-square test was used to determine the association between dependent and independent variables. Variables with p value < 0.05 were considered as statistically significant.

Result: A total of 371 study participants were included in the study giving a response rate of 94.8%. Of study participants 48% of them were adhere to insulin. 79.2 % and 86%of the respondents were had good knowledge toward insulin and diabetes mellitus respectively. Level of education (χ^2=32.1, p<0.001), cost of insulin (χ^2=6.1, p=0.014), knowledge to diabetes mellitus (χ^2=4.3, p=0.039), knowledge of insulin (χ^2=6.6, p=0.01) and attitude toward diabetes mellitus (χ^2=5.4, p=0.021)were variables significantly associated with adherence to insulin.

Conclusion and Recommendation: This study found that more than half of the study participants were not adherence to insulin. Consideration should be given to these factors contributed for low adherence to insulin. Intervention strategies focused on educating the patients to better understand of illness and importance of adherence to insulin might be useful in improving adherence to medications.

Keywords: Adherence; Diabetes; Insulin; Jimma

Introduction

Diabetes mellitus (DM) is a group of metabolic disorder characterized by elevated blood glucose levels (hyperglycemia). American Diabetes association classifies diabetes into the following general categories: Type 1 diabetes, Type 2 diabetes, Gestational diabetes and mellitus, Diabetes due to other causes. Type 1 diabetes is caused by an autoimmune reaction in which the body's immune system attacks the insulin producing beta cells of the pancreas. As a result, the body produces very little or no insulin. The causes of this destructive process are not fully understood but a likely explanation is that the combination of genetic susceptibility (conferred by a large number of genes) and an environmental trigger, such as a viral infection, initiate the autoimmune reaction. Toxins or some dietary factors have also been implicated [1-3].

Type 2 diabetes, which is the commonest type of diabetes, hyperglycemia is the result, initially, of the inability of the body's cells to respond fully to insulin, a situation termed 'insulin resistance'. During the state of insulin resistance, the hormone is ineffective and, in due course, prompts an increase in insulin production. Over time, insufficient production of insulin can develop as a result of failure of the pancreatic beta cells to keep up with demand [2,3].

To control the burden of DM, patients need to use insulin therapy as prescribed by the health care providers. Type 1 DM (T1DM) patients are treated by multiple-dose insulin injection or continuous subcutaneous insulin infusion but type 2 DM (T2DM) is a progressive disease with a treatment protocol adjusted in line with the disease's progression. Many patients with T2DM eventually require insulin to maintain adequate glycemic control [4]. Insulin therapy remains unacceptable amongst patients with DM because of different reasons like needle phobia, expenses, and inconvenience of the daily injections [5].

Adherence defined as "active, collaborative and voluntary involvement of the patients in a mutually acceptable course of behavior to produce a therapeutic result [6]. The goal of diabetes treatment is mainly to control blood glucose levels as near normal as possible with minimal complications [7]. Patient self-care practices are found to be important for patients to achieve the desired treatment targets and contribute meaningfully to the management of their disease one of which is adherence to the prescribed treatment [8]. Good adherence to insulin treatment, has been associated with improved levels of glycemic control, Reduced risk of developing acute and chronic diabetic complication in contrast Poor adherence to insulin therapy have serious long term and detrimental effect to the patient by increasing the risk of diabetes complication [9-11].

Globally, diabetes is among top 10 causes of death. The prevalence of diabetes has been rising rapidly throughout the world. The most recent IDF atlas 2019 estimates that Worldwide there are 351.7 million people of working age (20–64 years) with diagnosed or undiagnosed diabetes in 2019. This number is expected to increase to 417.3 million by 2030 and to 486.1 million by 2045 in total [3,12]. More than 16 million people with diabetes live in the African region; by 2045 it will be around 41 million [3]. About 4.36% (1.9 million) of the population is estimated to live with diabetes and the number of deaths attributed to diabetes reached 34,262 in 2013. Only in Africa region an estimated USD 2.8 billion was spent on health care expenditure due to diabetes in 201, Reports are expecting the expenditure to rise by 61% by 2030 [13].

This is hushed, but impending; public health problem would impose substantial challenges on the health care systems as well as on the economy of most developing nations in the near future. This is because a significant proportion of individuals who suffer from the condition in these countries are within the productive age these are the same individuals who are expected to drive the economic machinery in these nations [14]. Ethiopia, which is one of the developing nations, is at a risk of increased diabetes incidence. Recent reports from World health organization (WHO) shows alarming magnitude of non-adherence and its long-term complications. In developing countries effective insulin administration to manage hyperglycemic remains challenging, Ethiopia is not different from other developing countries when we come to adherence to insulin treatment, studies done in different parts of the country showing relatively higher rate of non-adherence range from 33%-66% [5,7,15-18].

Adherence to treatment significantly influences the prevention and control of acute and long-term complications of diabetes mellitus. In contrary to the benefits of insulin therapy, significant number of patients with diabetes show low adheres to treatment and some patients avoid insulin therapy or not willing to start it. Several studies about chronic disease treatment have showed that patients discontinue their medications or even do not take them at all because they perceive that they are ineffective with untoward side effects [5,19-21].

Studies conducted in developed and developing countries showed that Good adherence to insulin treatment, compared to a low-level of adherence, has been associated with improved levels of glycemic control which, in turn, reduces the risk of developing acute and chronic diabetic complication [9-11]. Despite the widely known fact of multiple benefits of adherence to insulin therapy, poor adherence among patients remains a common problem in substantial number of patients with diabetes mellitus [22,23]. Therefore, this study assesses level of adherence and associated factors in among diabetic patient in JUMC.

Methods and Materials

Study area and Study Period

The study was conducted at chronic follow up clinic of Jimma University medical center from November 01/11/2020-December-15/12/2020. Jimma University medical center located in Jimma university which located 343 Km from Addis Ababa. JUMC established in 1930, is one of the oldest public hospitals in the country and it is the only referral hospital in the southwestern part of the country providing service for more than 18 million people with catchment area of 17,500 km^2. More than 12,384 and 5832 patients had followed up at chronic clinic of JUMC. Of them around a total of 3078 are diabetic patients and 2052 of them takes insulin. About 140 diabetic patients had flow at JUMC per week.

Study design:

Institutional based Cross-sectional study design was conducted.

Source Population

All diabetic patients' ≥18 years that have been registered and taking insulin at the diabetic follow up clinic of JUMC.

Study Population

Diabetic patients ≥ 18 years who have been registered and taking insulin at the diabetic follow up clinic of JUMC and available during the study period.

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Inclusion and exclusion criteria

All adult diabetic patients on insulin at least for three months were included in the study. Patients with incomplete medical record and individuals who are unable to communicate due to serious neurological deficit and other serious illness were excluded from the study.

Sample Size Determination and Sampling Technique

Sample size was determined using a single population proportion formula by taking p-value 59% which taken from study conducted in Bahrdar Felege Hiwot [18]. By adding 5% non-response rate, the final sample size is **391.** Consecutive sampling technique was used to select study participants till calculated sample size is obtained.

Operational Definition and Measurements

Adherence

Adherence was measured by an adopted eight-item Morisky's Medication Adherence Scale (MMAS) - a multi-item questionnaire that is widely used to measure self-reported adherence. Items 1-7 are yes/no questions, in which a "no" answer receives a score of 1 and a "yes" answer receives a score of 0, except for item 5, which is reverse-scored. Item 8 is measured on a five-point scale. The responses "never", "once in a while", "sometimes", "usually", and "all the time" are scored, 1, 0.75, 0.50, 0.25, and 0, respectively. Total score ranges from 0 to 8 [24]. In this study individual scores >= 6 were considered as adhere to insulin and those who scores < 6 is considered non-adherent.

Knowledge Related to DM

It was measured with eight knowledge items, with a score of "1" awarded for correct answers and "0" for incorrect answers. The total knowledge score ranged from 0–8; a score of ≥ 6 was considered as had good knowledge and those who scores < was considered had poor knowledge [25].

Knowledge Related Insulin

It was measured using 10 items with a yes or no category response, those who scored the ≥ mean and < mean was considered as had good and poor knowledge respectively [26].

Attitude Toward Insulin Self-Administration

It was measured using 5 items with a response category ranging from strongly disagree =1, disagree=2, neutral=3, agree=4, strongly agree=5, those those who scored ≥ mean and < mean was considered as have a positive and negative attitude respectively [27].

Data Quality Assurance

The questionnaire was translated to local language Amharic and Afan Oromo. The questionnaire was pretested on 5% of the actual sample in Seka hospital one week before actual data collection and correction was taken accordingly. During data collection questionnaires was checked for completeness on daily basis by principal investigators.

Data Processing and Analysis

After the data collection, data were checked manually for its completeness every day. Data was coded and entered into statistical package for social science (SPSS) window 21 for analysis. Descriptive statistics was used to describe the data. Chi-square test was used to determine the association between dependent and independent variables. Variables with p value < 0.05 were considered as statistically significant.

Results

Sociodemographic characteristic of respondents

A total of 371 study participants were included in the study giving a response rate of 94.8%. The mean age of the respondents was 33.19 (±11.45) years. More than half (57.7%) of the respondents were males. About 181(48.8%) of respondents were married. Three fourth (277 (74.7%) of the study participants had earning monthly income more than one thousand birr. 52.8% of the respondents live within five kilometers from the nearest health facility (Table 1).

Treatment Related Factors

Half 186 (50.1%) of the respondents had 1-4 years course of insulin therapy. Almost all 348 (93.8%) of study participants gate the insulin and syringe through purchase. Moreover majority330 (88.9%) of individuals take insulin regularly and do not discard insulin after one month 347(93.5%). About 355 (95.7) of the respondents store their insulin out of home (Table 2).

Clinical Related Factors

More than half 222(59.8%) of the respondents had glucometer at home and three forth of the respondents 274(73.9%) were diagnosed five years back. About 83 (22.4) respondents had history of other chronic disease. Around three fourth 267 (72.0%) of the respondents were patient with type1 DM. Majority 344 (92.7%) of the respondents visit health care provider at least once in three months (Table 3).

Knowledge About Diabetes Mellitus

Majority 314 (84.6%) of the respondents have heard about diabetes mellitus and more than two third 265 (71.4%) of the respondents knows diabetes as it is not a genetic disease. More than three fourth 292 (78.7%) of the respondents knows that reducing carbohydrate intake can reduce diabetes. Majority 319(86%) of the respondents have good knowledge toward diabetes mellitus (Table 4).

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Table 1: Socio-demographic characteristics of study participants on chronic follow up clinic of Jimma University medical center, Jan 2021.

Variables	Categories	Frequency (No.)	Percent (%)
Age in years	18-30	178	48
	31-59	158	42.6
	60 and above	35	9.4
Sex	Male	214	57.7
	Female	157	42.3
Marital status	Single	156	42
	Married	181	48.8
	Divorced	22	5.9
	Widowed	12	3.2
Religion	Muslim	165	44.5
	Orthodox	139	37.5
	Protestant	65	16.7
	Catholic	5	1.3
Level of education	Can`t read and write	33	8.9
	Read and write	27	7.3
	Primary education	100	27
	Secondary education	129	34.8
	Higher education	82	22.1
Month income in ETB	<500	73	19.7
	599- 999	21	5.7
	>1000	277	74.7
Distance from health facility in km	<=5	196	52.8
	> 5	175	47.2
Occupation status	Farmer	16	4.3
	Merchant	100	27
	Housewife	30	8.1
	Government employee	114	30.9
	Other, specify	111	29.9

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Table 2: Frequency distribution of treatment related characteristics of study participants on chronic follow up clinic of Jimma university medical center, Jan 2021.

Variables	Categories	Frequency (No.)	Percent (%)
Duration of insulin therapy	1-4 year	186	50.1
	> 5 year	185	49.9
Dosing schedule of insulin	Twice a day	371	100
Time of using needle	Once a day	53	14.3
	Twice a day	172	46.4
	2-6 times a day	140	37.7
	>7 times a day	6	1.6
Do you purchase insulin and syringe	Yes	348	93.8
	No	23	6.2
From where you bring your insulin	Purchase	348	93.8
	Free	23	6.2
How you rate cost of insulin	Cheap	20	5.4
	Costly	351	94.6
When you took insulin	Before meal	371	100
Do you take insulin regularly	Yes	330	88.9
	No	41	11.1
Adverse reaction at injection site	Yes	19	5.1
	No	352	94.5
Do you discard insulin after 1 month	Yes	14	6.5
	No	347	93.5
Carry insulin out of home	Yes	355	95.7
	No	16	4.3

Table 3: Frequency distribution of clinical related characteristics of study participants on chronic follow up clinic of Jimma university medical center, Jan 2021.

Variables	Categories	Frequency (No.)	Percent (%)
Having glucometer at home	Yes	222	59.8
	No	149	40.2
Duration since diagnosed diabetic (years)	<5 year	97	26.1
	>5 year	274	73.9
Do you have any chronic disease	Yes	83	22.4
	No	288	77.6
Chronic condition you have	Hypertension	51	61.4
	Heart disease	9	10.8
	Lung disease	11	13.3
	Other chronic disease	12	14.5
Types of DM	Type 1	267	72
	Type 2	104	28
How often do you visit health care provider	Once in a month	239	64.4
	Once in three month	105	28.3
	Once in six month	27	7.3

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Table 4: Knowledge about diabetes mellitus of the study participants on chronic follows up clinic of Jimma university medical center, Jan 2021.

Knowledge About DM	Yes		No	
	Frequency (No)	Percent (%)	Frequency (No)	Percent (%)
Have you ever heard of diabetes	314	84.6	57	15.4
Do you know what glucose tolerance test is?	297	80.1	74	19.9
Do you know how to measure diabetes	271	73	100	27
Do you know diabetes can cause eye disease?	358	96.5	13	3.5
Do you know diabetes is a genetic disease	265	71.4	106	28.6
Do you know exercise can be helpful to prevent diabetes?	357	96.2	14	3.8
Do you know that reducing carbohydrate intake can reduce diabetes?	292	78.7	79	21.3
Do you know that reducing sugar intake, reduce diabetes	363	97.8	7	1.9

Knowledge of DM Patient Toward Insulin

More than 97% of the respondents know as insulin is stored in the refrigerator or cold place. Insulin injection is taken soon after or just before taking food. All 371(100%) respondents know the sites of insulin injection and angle of administration of insulin. Majority 354(95.4%) of the respondents knows the complications of insulin therapy like low Blood Sugar, insulin allergy, insulin resistance and wasting of subcutaneous tissue. More than three fourth 294(79.2) of the respondents have good knowledge toward insulin (Table 5).

Table 5: Knowledge of study participants toward insulin, Jimma university medical center, Jan

Knowledge About Insulin	Yes		No	
	Frequency (No)	Percent (%)	Frequency (No)	Percent (%)
Insulin vial is stored in the refrigerator or Cold place	362	97.6	9	2.4
Insulin injection is taken soon after Or just before taking food	363	97.8	8	2.2
The sites for insulin injection are abdomen, Thigh, Glutei and deltoid	371	100		
The angle to administer insulin is 450	371	100		
The distance to rotate on the same site is One thumb	315	84.9	56	15.1
Ways to reduce pain during insulin injection are enters the skin, do not manipulate the needle once Inserted, avoiding re using of the same site	371	100		
The complications of insulin therapy are low Blood Sugar, insulin allergy, insulin resistance and wasting of subcutaneous tissue	354	95.4	17	4.6
The use of rotation of the injection site is to Reduce pain, prevent wasting of subcutaneous Tissues	349	94.1	22	5.9
Massage after injection is used to Reduce the rapid absorption of insulin	113	30.5	258	69.5
The benefit of insulin self-administration Are, time saving, inexpensive and easy to take on self while traveling	312	84.1	59	15.9

Attitudes of DM Patients to ward Insulin Self-Administration

Majority 280 (75.5 %) of the respondents have Insulin self-administration correctly Decrease glucose in the blood and more 282 (76.0%) of the respondent's attitude knows diabetes as it is. Insulin self-administration is beneficiary (Table 6). Majority of 292(78.7%) of the respondents had good attitude toward Insulin Self-Administration. Majority 319 (86.0%) of the respondents had good DM (Table 7 & 8).

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Table 6: Attitudes of diabetic patients to ward insulin self-administration, Jimma University medical center, Jan 2021.

Attitude toward Insulin Self-Administration	Strongly Disagree		Disagree		Not sure		Agree		Strongly Agree	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Insulin causes other health problem	49	13.2	263	70.9	43	11.6	10	2.7	6	1.6
Insulin self-administration correctly Decrease glucose in the blood	13	3.5	20	5.4	21	5.7	37	10	280	75.5
Insulin self-administration is a tiresome	59	15.9	135	36.4	133	35.8	27	7.3	17	4.6
Insulin self-administration bring stigma	154	41.5	129	34.8	33	8.9	25	6.7	30	8.1
Insulin self-administration is beneficiary	12	3.2	27	7.3	5	1.3	45	12.1	282	76

Table 7: Overall knowledge of diabetic patients of Diabetes Mellitus, insulin therapy, and attitude of diabetic patients to ward Insulin Self-Administration.

Overall total frequency of category		Frequency	Percent %
Overall knowledge of patients about DM	Poor	52	14
	Good	319	86
Overall knowledge of patients about insulin therapy	Poor	77	20.8
	Good	294	79.2
Attitude of patients toward Insulin Self-Administration	Poor attitude	79	21.30%
	Good attitude	292	78.70%

Table 8: Insulin Adherence among Diabetes Mellitus patients, Jimma university medical center, Jan 2021.

Medication Adherence	Yes %		No %	
	Frequency (No)	Percent (%)	Frequency (No)	Percent (%)
Do you sometimes forget to take your medicine?	171	46.2	200	53.8
thinking over the past two weeks, were there any days when you did not take your medicine	163	44	207	56
have you ever cut back or stopped taking your medicine without telling your doctor because you felt worse when you took it	166	44.8	205	55.2
when you travel or leave home, do you sometimes forget to bring your medicine	156	42.1	214	57.9
did you take all your medicines yesterday	212	57.3	158	42.7
When you feel like your symptoms are under control, do you sometimes stop taking your medicine	170	45.6	201	54.4
taking medicine every day is a real in convenience for some people, do you ever feel hassled about sticking to your treatment plan and by choosing one of the options for the questions	159	42.9	212	57.1

Level of Insulin Adherence

Of the study participants 179 (48%) were adhere insulin (Figure 1).

Factors Associated with Adherence to Insulin

Level of education (χ^2 =32.1, p<0.001), cost of insulin (χ^2 =6.1, p=0.014), knowledge to diabetes mellitus (χ^2 =4.3, p=0.039), knowledge of insulin (χ^2 =6.6, p=0.01) and attitude toward diabetes mellitus (χ^2 =5.4, p=0.021)were variables significantly associated with adherence to insulin (Table 9).

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Table 9: Factors Associated with adherence to insulin among study participants on chronic follow up clinic of Jimma university medical center, Jan 2021.

Variables	Category	Adhere		Non adhere		Chi^2	P value
		Frequency	Percent (%)	Frequency	Percent (%)		
Age	18-30	100	56.2	78	43.8	4.6	0.101
	31-59	79	50	79	50		
	>60&above	13	37.1	22	62.9		
Sex	Male	117	54.1	97	45.3	1.7	0.189
	Female	75	47.8	82	52.2		
Religion	Muslim	87	55.4	70	44.6	7.3	0.063
	Orthodox	58	43	77	57		
	Protestant	38	61.3	24	38.7		
	Catholic	9	62.9	8	47.5		
Level of education	Can't read and write	6	15.8	32	84.2	32.1	<0.001*
	Read and write	9	34.6	17	65.4		
	Primary education	51	51	49	49		
	Secondary education	73	56.6	56	43.4		
	Higher education	53	67.9	25	32		
Distance to health facility	< 5 km	96	49	100	51	1.3	0.248
	> 5km	96	54.9	79	45.1		
Occupation	Farmer	9	56.2	7	43.8	6.2	0.184
	Merchant	53	53	47	47		
	Housewife	12	40	18	60		
	Government employee	52	45.6	62	54.4		
	Other, Specify	66	59.5	45	40.5		
Cost of Insulin	Cheap	5	25	15	75	6.1	0.014*
	Expensive	187	53.3	164	46.7		
Time of Using Needle	Once a day	20	37.7	33	62.3	7.32	0.062
	Twice a day	100	58.1	72	41.9		
	2-6 times a day	69	49.3	71	50.7		
	>7 times a day	3	50	3	50		
Glucometer at Home	Yes	123	55.7	98	44.3	3.3	0.068
	No	69	46	81	54		
Types of DM	Diabetes type 1	144	53.9	123	46.1	1.8	0.178
	Diabetes type 2	48	46.2	56	53.8		
Duration Since Diagnosis	< 5 yrs	38	39.2	59	60.8	8.3	0.004*
	≥5yrs	154	56.2	120	43.8		
Knowledge of DM	Good knowledge	172	53.9	147	46.1	4.3	0.039*
	Poor knowledge	20	38.5	32	61.5		
Knowledge of Insulin	Poor knowledge	27	38	44	62	6.6	0.010*
	Good knowledge	165	55	135	45		
Attitude toward DM	Negative attitude	50	63.3	29	36.7	5.4	0.021*
	Positive attitude	142	48.6	150	51.4		

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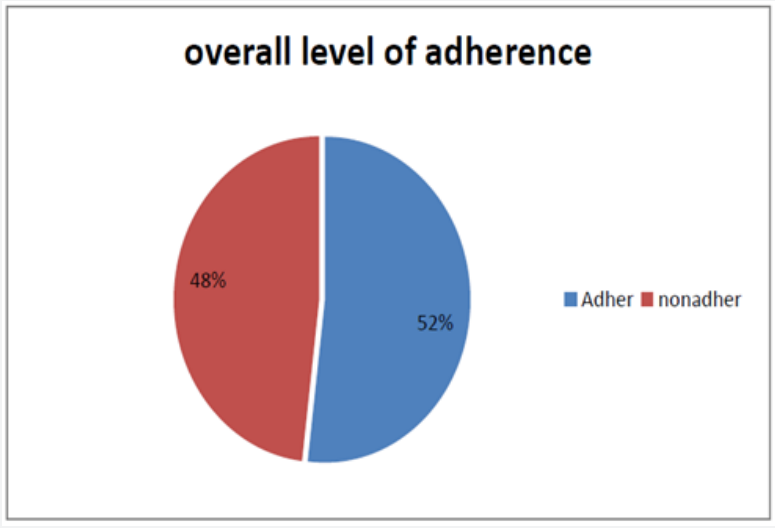

Figure 1: level of Insulin Adherence of the study participants on chronic follow up clinic of Jimma university medical center, Jan 2021.

Discussion

This study revealed that prevalence of adherence to insulin is 192 (51.8 %.) variables like educational status, duration of DM, cost of insulin, Knowledge of diabetes mellitus, knowledge of Insulin and attitude toward diabetes mellitus were variables associated with Adherence to insulin. The finding of this study is in line with study conducted in south India which reports that the adherence to insulin is 54.6% [28]. The finding of this study is lower than studies conducted in Saudi Arabia, Mexico, Korea, Botswana, Uganda, and Tanzania which revealed that the adherence to insulin is 76 %, 83%, 61%, 83.3%,71.2% respectively [25,27-31]. The variation may be due to the difference in the study area and sociodemographic characteristics of study participants.

This study revealed that respondent's educational status is associated with insulin adherence, this is consistent with studies conducted in Gondar [31]. This might be due to the fact that those with better educational level have better access to health-related information which could in turn have positive effect on adherence to insulin. In this study respondent's knowledge of diabetes mellitus and knowledge of insulin is associated with insulin adherence. This is consistent with studies conducted in Nigeria, Gondar, and Tigray [17,31,32]. The possible explanation is that since insulin administration is difficult and patients are required to have more complex cognitive knowledge and skills to be able to understand the prescribed therapy and to adhere to treatment for good glucose control. Moreover, having knowledge about DM and its medications creates a clear understanding and avoids confusion about the treatment and the disease condition.

In this study respondent's Attitude toward diabetes mellitus is associated with insulin adherence. This is consistent with study conducted in Tigray in which those with satisfactory attitude have better adherence to insulin treatment. The possible reason for this might be those with satisfactory attitude would have good knowledge about the disease and its treatments which in turn brings better adherence. In this study cost of insulin is associated with insulin adherence. This was consistent with other studies conducted in Bahrdar, Tigray, Tikur Ambessa Specialized hospital [17,18,33] and This may be related with the low socioeconomic status of study participants given expenditure for other day to day activities it may be difficult to purchase insulin which makes it more difficult to adhere to the regimen [34-40].

Conclusion

Even adherence to insulin is an important component of epilepsy treatment, this study found that adherence to insulin is poor, which highlights the prevalent problematic degree nonadherence to insulin therapy. So that encouraging the patients on the importance adherence on control of disease should be considered as routine part of epilepsy management. Information dissemination to the people with epilepsy and to the public at large is important to improve adherence and to promote healthy life for those individuals.

References

1. Landon BE, Zaslavsky AM, Souza J, Ayanian JZ (2018) Trends in Diabetes Treatment and Monitoring among Medicare Beneficiaries. J Gen Intern Med 33(4): 471-480.
2. Tests D (2015) Classification and diagnosis of diabetes. Diabetes Care 38: S8-S16.
3. (2019) America Diabetes Association. IDF Diabetes Atlas. International Diabetes Federation. P. S15.
4. (2016) Recommendations CP. Standards of Medical Care in Diabetes, Abridged for Primary Care Providers. Clin Diabetes. 34(1): 3-21.

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5. Ogbera AO, Kuku SF (2012) Insulin use, prescription patterns, regimens and costs.-a narrative from a developing country. Diabetol Metab Syndr 4(1): 2-7.
6. Schneider S, Psych D, Iannotti RJ, Nansel TR, Haynie DL, et al. (2007) Identification of Distinct Self-Management Styles of Adolescents With Type 1 Diabetes. Diabetes Care 30(5): 1107-1112.
7. (2011) Diabetes VII, In C. CONTENTS DIAGNOSIS OF DIABETES, 34.
8. (2015) IDF Diabetes Atlas Seventh E, Pp. 1-140.
9. Doggrell SA, Warot S (2014) The association between the measurement of adherence to anti-diabetes medicine and the HbA1c. Int J Clin Pharm 36(3): 488-497.
10. (2012) The Impact of Treatment Noncompliance.
11. Shubrook J, Butts A, Chamberlain JJ, Johnson EL, Leal S, et al. (2017) Standards of medical care in diabetes—2017 abridged for primary care providers. Clin Diabetes 35(1): 5-26.
12. WHO Global Report (2016) Global Report on Diabetes. Isbn 978: 6-86.
13. International Diabetes Federation (2011) IDF Diabetes Atlas 5th edition. Media, Pp. 20-26.
14. Guariguata L, Whiting D, Weil C, Unwin N (2011) The International Diabetes Federation diabetes atlas methodology for estimating global and national prevalence of diabetes in adults. Diabetes Res Clin Pract 94(3): 322–332.
15. Diabetes VII (2011) In C. Standards of medical care in diabetes-2011. Diabetes Care 34.
16. Fikadu Ejeta, Yarlagadda Raghavendra, Messay Wolde-Mariam (2015) Patient Adherence to Insulin Therapy in Diabetes Type 1 and Type 2 in Chronic Ambulatory Clinic of Jimma University. International Journal of Pharma Sciences and Research 6(4): 796-806.
17. Mariye T, Girmay A, Birhanu T, Tasew H, Teklay Get al. (2019) Adherence to insulin therapy and associated factors among patients with diabetes mellitus in public hospitals of central zone of Tigray, Ethiopia, 2018: A cross-sectional study. Pan Afr Med J 33: 1-10.
18. Gerada Y, Mengistu Z, Demessie A, Fantahun A, Gebrekirstos K (2017) Adherence to insulin self-administration and associated factors among diabetes mellitus patients at Tikur Anbessa specialized hospital. J Diabetes Metab Disord 16(1): 1-6.
19. Toljamo M, Hentinen M (2001) Adherence to self-care and glycaemic control among people with insulin-dependent diabetes mellitus. J Adv Nurs 34(6): 780-786.
20. Grant RW, Devita NG, Singer DE, Meigs JB (2003) Polypharmacy and medication adherence in patients with type 2 diabetes. Diabetes Care 26(5): 1408-1412.
21. Donnan PT, MacDonald TM, Morris AD (2002) Adherence to prescribed oral hypoglycaemic medication in a population of patients with Type 2 diabetes: A retrospective cohort study. Diabet Med 19(4): 279-284.
22. Health N (2010) Barriers to Achieving Glycemic Targets : Who Omits Insulin and Why ? Diabetes Care 33(2): 450-452.
23. Davies MJ, Gagliardino JJ, Gray LJ, Khunti K, Mohan V, et al. (2013) Real-world factors affecting adherence to insulin therapy in patients with Type 1 or Type 2 diabetes mellitus: A systematic review. Diabet Med 30(5): 512-524.
24. Bermeo-cabrera J, Almeda-valdes P, Riofrios-palacios J, Aguilar-salinas CA, Mehta R (2018) Insulin Adherence in Type 2 Diabetes in Mexico : Behaviors and Barriers. J Diabetes Res 2018.
25. Almaghaslah D, Abdelrhman AK, Al-Masdaf SK, Majrashi LM, Matary BM, et al. (2018) Factors contributing to non-adherence to insulin therapy among type 1 and type2 diabetes mellitus patients in Asser region, Saudi Arabia. Biomedical Research 29(10): 2090-2095.
26. Osborn CY, Gonzalez JS (2017) HHS Public Access 39(4): 633-641.
27. Rwegerera GM, Moshomo T, Gaenamong M, Oyewo TA, Gollakota S, Mhimbira FA, et al. (2018) Antidiabetic medication adherence and associated factors among patients in Botswana; implications for the future. Alexandria Journal of Medicine 54(2): 103-109.
28. Bagonza J, Rutebemberwa E, Bazeyo W (2015) Adherence to anti diabetic medication among patients with diabetes in eastern Uganda; A cross sectional study Health systems and services in low- and middle-income settings. BMC Health Serv Res 15(1): 1-7.
29. Rwegerera GM utashambar (2014) Adherence to anti-diabetic drugs among patients with Type 2 diabetes mellitus at Muhimbili National Hospital, Dar es Salaam, Tanzania- A cross-sectional study. Pan Afr Med J 17: 252.
30. EI-Hadiyah TM, Mustafa Madani A, Abdelrahim HM, Khidir Yousif A (2016) Factors Affecting Medication Non Adherence in Type 2 Sudanese Diabetic Patients. Pharmacol & Pharmacy 7(4): 141–116.
31. Abebaw M, Messele A, Hailu M, Zewdu F (2016) Adherence and Associated Factors towards Antidiabetic Medication among Type II Diabetic Patients on Follow-Up at University of Gondar Hospital, Northwest Ethiopia. Advances in Nursing 2016: 1-7.
32. Tewabe T, Kindie S (2018) Level of insulin adherence among diabetes mellitus patients in Felege Hiwot Referral Hospital, Bahir Dar, Northwest Ethiopia, 2017: A cross-sectional study. BMC Res Notes 11(1): 1-6.
33. Hospital AS, Ababa A (2014) Assessment of antidiabetic medication adherence and its effect on glycemic control in ambulatory patients with type 2 diabetes at Tikur Tessema Tsehay (B . Pharm) A Thesis Submitted to The Department of Pharmacology and Clinical Pharmacy Presented in Pa.
34. Rwegerera GM (2014) Adherence to anti-diabetic drugs among patients with Type 2 diabetes mellitus. Pan Afr Med J 17: 252.
35. Adisa R, Fakeye TO (2014) Treatment non-adherence among patients with poorly controlled type 2 diabetes in am- bulatory care settings in southwestern Nigeria. Afr Health Sci 14(1): 1-10.
36. Gerensea H, Moges A, Shumiyee B, Abrha F, Yesuf M, et al. (2016) Paitents Knowledge and Atittude on Insulin Self Administration in Mekele Tigray, Ethiopia. Journal of Diabetic Complications & Type One Diabetic 1(1): 1-6.
37. Morisky D (2008) Predictive Validity of a Medication Adherence Measure for Hypertension Cont. J Clin Hypertens 10(5): 348-354.
38. Gillani AH, Mohammad F, Islam A, Hayat K (2019) Knowledge , Attitudes and Practices Regarding Diabetes in the General Population : A Cross-Sectional Study from Pakistan. Int J Environ Res Public Health 15(9): 1906.
39. Divya S, Nadig P (2015) Factors contributing to non-adherence to medication among type 2 diabetes mellitus in patients attending tertiary care hospital in South India. Asian Journal of Pharmaceutical and Clinical Research 8(2): 274-276.
40. Park K-A, Kim J-G, Kim B-W, Kam S, Kim K-Y, et al. (2010) Factors that Affect Medication Adherence in Elderly Patients with Diabetes Mellitus. Korean Diabetes J 34(1): 55-65.

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