MEDICATION ADHERANCE AND ITS ASSOCIATED FACTORS AMONG DIABETES PATIENTS HAVING FOLLOW UP IN DIABETIC CLINIC AT HAWASSA UNIVERSITY COMPRENSIVE SPECIALIZED HOSPITAL.

Bereket Beyene Gebre¹*, Zewde Oltaye Oche ².

Corresponding Author and first author

¹* (School of nursing, College of medicine and Health Science, Hawassa university, Southern Ethiopia).

Email: bereket2007beyene@gmail.com

Authors

² Zewde Oltaye Oche (School of nursing, College of medicine and Health Science, Hawassa university, Southern Ethiopia).

Email: oltayezewdie@yahoo.com
Abstract

Objective: To assess the magnitude of medication adherence and its associated factors among diabetic patient in diabetic (DM) clinic, Southern Ethiopia, 2019.

Result: The magnitude of medication adherence among Diabetes was found to be 58.8%. The independent predictors were social support AOR 95%CI 3.2(1.28, 4.93), dietary regimen AOR 95% CI 2.45(1.37, 4.35) and duration of illness AOR 95% CI 1.52 (1.32, 2.12).

Health information provision for the patients as well as for the community through different means of communication should be essential to increase the medication adherence and social support to bring the good clinical outcome.

Key word: Magnitude, medication adherence, Diabetes, MMAS.
Introduction

Background
Diabetes mellitus (DM) is a group of metabolic disorders of carbohydrates, lipids, and proteins characterized by high blood glucose level. DM occurs due to absence of insulin secretion or decreased insulin secretion [1]. About 415 million people worldwide, or 8.8% of adults aged 20–79 years, were estimated to have diabetes in 2015. From this, about 75% of them live in low and middle-income countries. If these trends continue, by 2040, some 642 million people (or one in ten adults) will have diabetes. The largest increases will take place in the regions where economies are moving from low-income to middle-income levels [2]. In 2015 in sub-Saharan Africa, the International Diabetes Federation (IDF) estimates that there were about 14.2 million people lived with diabetes; it is projected that in 2040 this number will increase to 34.2 million people [3]. Medication adherence is defined by world health organization as the extent to which person’s behavior relates with the agreed recommendation from health care providers [4]. Adherence has been also defined as the “active, voluntary, and collaborative involvement of the patient to certain recommended regimen to brought a therapeutic result” [5].

Worldwide, adherence to medication for diabetes varies in a wide range of variation. So, Poor adherence to treatment of DM is a worldwide problem to decrease the magnitude of adherence. As the world health organization (WHO) statement about 50% of a patient diagnosed with DM were fully compliant with their treatment regimen, in developing country the rate are even lower. It is true that many patient faces in striking recommended
treatment regimen [6]. Anti-diabetic medications are prescribed for DM patients to bring glycaemic control, therefore non-adherence to drugs can alter blood glucose level resulting in complications [7]. Poor adherence result in remarkably high rates of morbidity and mortality due to metabolic control, especially poor glycemic control [8]. The studies indicated that there were different factors related to adherence to medication. These were patients, conditions, socioeconomic status, the health system and therapy. Therefore, interventions which focus on improving medication adherence should aim this entire factor [9]. Adhering to their medication is still difficult in type II diabetic patients. In Ethiopia, particularly in the study area, little is known about the adherence status of medication among DM patients and its associated factors. Therefore, the aim of this study was to assess the adherence status and associated factors among diabetes.

**OBJECTIVE**

**General objective**
To assess the magnitude of medication adherence and its associated factors with poor adherence among diabetic patient having follow up in diabetic clinic, Hawassa, Southern Ethiopia, 2019.

**Specific objectives**
To determine magnitude of medication adherence among diabetic patients attending medication at Hawassa, Southern Ethiopia, 2019.
To identify associated factors of medication adherence with poor adherence among diabetes at Hawassa, Southern Ethiopia, 2019.

**MAIN TEXT**

**METHODOLOGY**

**Study area**
The study was conducted in Hawassa Compressive Specialized Hospital at Hawassa town which is the capital city of Southern nation nationality and peoples region (SNNPR) region in Ethiopia and it is 273 km far from Addis
Ababa. Currently Hawassa University Compressive Specialized Hospital (HUCSH) is providing health service for over 18 million people in and around SNNPR. The Hospital had 461 diabetes patients attending the clinic for follow up.

**Study period**
The study was conducted from March 8/3/ 2019- May 23/5/ 2019.

**Study design**
Facility based cross-sectional study design was employed.

**Population**

**Source population**
Was all diabetes out patients who was visiting the diabetes clinic in HUCSH during the study period.

**Study population**
Sampled DM patient who was randomly selected during the study period

**Study Unit**
Were individual diabetic patient who participated in the study.

**Inclusion and Exclusion Criteria**

**Inclusion Criteria:**
All sampled diabetes mellitus patient whose age was 18 and above which can give informed consent was included.

**Exclusion Criteria**
Were sampled diabetic patient who were mentally ill and seriously ill during data collection.

**Sample Size Determination**
Sample size was determined using single population proportion formula.

\[
n \geq \frac{(z^2 \times p \times (1-p))}{d^2} \times \frac{(2.57^2 \times 0.51 \times 0.487)}{(0.09^2 \times 0.13)} \times 384
\]

\[
n = \text{sample size}
\]
p (51.3) = prevalence of medication adherence among diabetes at Zewiditu Memorial Hospital [10].

\[ q = 1 - p = (100 - 51.3) \]

d = marginal error

\[ Z_{\alpha/2} = \text{at} \]

The sample size were 461, since the study population is less than 10,000, the correction formula was applied.

\[
\frac{n}{(1 - \frac{n}{N})} \frac{384}{461} = 210
\]

\[ n = 210 \text{ by considering 10% non-respondent rate the final sample size was 231 patients} \]

**Sampling Technique**

In Hawassa university comprehensive specialized Hospital 461 patients were registered in the DM registration book and then made into sampling frame, prepared from the list of patients who had been appointed for follow up during the study period. The 210 patients were selected by systematic random sampling. Then sampling interval were calculated by \( \frac{\bar{n}}{Ts} = (\bar{n} / Ts) \). \( \bar{n} \) denotes total number of diabetic patients who had follow up during appointment day which is in the study period was 461 and the Ts is total sample size. So, every 2\text{nd} patient was selected from sampling frame and the sampled DM outpatients were interviewed at exit of the service provision.

**Dependent Variables**

Medication adherence
Operational definition

**Adherent** - Those patients who scored equal or greater than 6 from the morisky medication adherence scale (MMAS).

**Non-adherent** - Those patient who scored less than 6 from the (MMAS).

Data collection methods and tool

The initial English version of the questionnaire was translated into Amharic. Then it was back translated in English independently by language experts to maintain the equivalence of the test questionnaire in Amharic. The questionnaires have 4 parts. Socio demographic information, morisky medication adherence scale-8 and behavioural factors and clinical factors were gathered from patients recorded data and own word.

Quality control

To assure the quality of the study finding, training of the data collectors (5) and supervisor (2), conducting pre-test had done. In addition to this, checking, editing and clearing the data at data collection site plus monitoring data collectors by principal investigators and supervisor was carried out.

Data processing and Analyzing

After checking collected data, the responses was cleaned, edited, coded and entered into the computer using Epi-data 3.1 version and exported to SPSS version 20.0. The data was checked for missed value before analysis. The descriptive analysis including frequency and cross tabs was done. Binary logistic regression was carried to assess the association of dependent variable with independent variables. Finally forward stepwise logistic regression model with all independent variables having p value <0.25 was fitted and adjusted odds ratio was calculated to identify independent predictors of poor adherence to medication.
Plan for dissemination
It was disseminate to Hawassa University CBE office of college of medicine and health science and to the school of Nursing. It was also disseminated to the HUCSH.

Ethical consideration
The study was conducted after approval of ethical review committee of hawassa university college of medicine and health science. Permission to conduct the study was obtained from authorities at HUCSH. Written informed consent was obtained from each study participant by assuring privacy and confidentiality throughout the data collection period in the Hospital.

RESULT
Magnitude of Medication adherence
According to this study the magnitude of medication adherence among DM patients were found to be 122 (55.2%).

Socio demographic characteristics and factors associated with medication adherence
Out of total 231 sampled diabetes patients; yield a response rate of 221(95.6%). Among them 110 (49.8%) were females (See table 1 below). From the socio demographic variables affecting the medication adherence among diabetes only social support were found to be associated in the binary logistic regression (BLR) (See table 1 below).

Behavioural characteristic and factors associated with medication adherence
From the total of 221 diabetes patient; 188 (85.1%) were not chew chat and drink alcohol (See table 2 below). In this study from the behavioural factors ; alcohol drinking, chat chewing and dietary regimen were found to be associated in binary logistic regression (See table 2 below).
Clinical characteristic and factors associated with medication adherence

In our study from clinical factors that affect medication adherence among Diabetes; four variables were found to be associated significantly in binary logistic regression. This were type of sugar, type of treatment, duration of illness and level of blood glucose (See table 3 below).

Independent factors of medication adherence

From 19 variables; 8 variables with p < 0.25 were entered into forward logistic regression. Then 3 variables were found to be independently associated. These were social support, dietary regimen and duration of illness.

DISCUSSION

In this study, the magnitude of medication adherence status in our study was 130 (58.8%). It is in line with the study done in 2016 at Zewditu Memorial hospital in Addis Ababa in which 51.3% were adhered to the ant diabetic’s medication [11]. This is might be due to uniformly distributed socio demographic characteristic of the respondents. Even though it is in line; continuous provision of health education about the importance of adhering to prescribed medication should be strengthened while the patient visit the hospital for medication follow up. Besides, the diabetes association should strictly discuss with them not to interrupt the recommended medication regimen. But our study result is low when compared to the study done in 2013 at University of Gondar Hospital which is 85.1% [12]. This might be lower educational status of the respondents and MMAS with cut point of 6 were used to determine the magnitude of medication adherence.
Our study reveals that those who were satisfied by their family and friends support had 3 times more likely found to be adhered to medication compared to those who were not satisfied. This study result is in line with the study done from 2015-2016 at Kenyatta national hospital in Kenya [13]. This might be due to those who had motivation and encouragement made them to be well psychologically and enable them strictly to follow recommended medication. Studies also indicate that poor social support has been associated with non adherence to medication [14].

Our study also reveals that those respondents who were adhered to the recommended dietary practice were found to be 2 times more likely adhered to prescribed medication. This study is also supported by studies conducted at Yemen in 2016 [15] which indicated that most of the respondents who were not adhered to diet had found to be not adhered to medication. So, of continuous provision of education about recommended dietary regimen for patients visiting DM clinic will be strengthened.

Duration of illness was also found to be significantly associated with the adherence status of the respondents. In this study; those patients who had been 5 years and above since medically diagnosed with diabetes were more likely to be adherent than those with less than 5 years of duration. This finding is in line with the study done in Urmia, Iran [16] and Nigeria [17]. This could be explained by patients with longer duration of diabetes by increases contacts with health care provider and health professionals are more likely to be given repetitive instruction on medication adherence and become aware of the complications and then adhered to medication. In addition, it could be a reflection of wider social interaction with other diabetic patients on ant diabetic medication adherence.

**CONCLUSION**

This study reveals that those medication adherence among diabetes patients were found to be low and its independent predictors were social support and dietary regimen and duration of years on follow up
RECOMMENDATION
Health information provision for the patients as well for the community through different means of communication should be essential to increase the medication adherence and social support to bring the good clinical outcome.

LIMITATION
There might be recall bias to respond medication intake questions. Since this study was cross sectional study, it shows point time occurrence of the adherence among patient.

Acronyms and Abbreviation
CBE: Community based education
EDHS: Ethiopian Demography Health Survey
HUCSH: Hawassa University Comprehensive Specialized Hospital
MMAS: Morisky medication adherence scale
WHO: World health organization

Declaration
Ethics approval and consent to participate
The study was conducted after approval of ethical review committee of hawassa university college of medicine and health science. Permission to conduct the study was obtained from authorities at HUCSH. Written informed consent was obtained from each study participant by assuring privacy and confidentiality throughout the data collection period in the Hospital. An individual who was unwilling to participate from the beginning or at any part of the interview was allowed to withdraw. There was no risk or hazardous procedures putting the participants at harm.

Consent to publish
I am a corresponding author and first author of this finding.

**Availability of data and materials**
The data supporting the finding were avail in public repositories.

**Competing interests**
There is no competing interest.

**Funding**
No funding is required.

**Author’s contribution**
The author contributes for this study in analysing the data gathered and preparing this manuscript.

**Acknowledgement**
First of all I would like to acknowledge Hawassa University college of medicine and health science Community based education office (CBE) for provision of an ethical clearance. I would also like to acknowledge Hawassa University comprehensive specialized Hospital for providing of permission for study to be conducted in DM clinic. My gratitude also goes to data collectors (Seblewongel Solomon, Gabrela mokonnen, Zenadin Abdela, Kidist Maereg and Tigist Solomon) and friends for their all rounded support throughout the completeness of the data.

**References**
1. Zinman B GJ, Buse JB, Lewin A, Schwartz S, Raskin P, Hale PM, Zdravkovic M, Blonde L. . American Diabetes Association. Standards of medical care in diabetes. Diabetes care. 2010;33(3):692
2. International Diabetes Federation. Diabetes Atlas. IDF. 7th edn. 2015.
3. IDF. IDF Diabetes Atlas 7th edition. 2015; pp70-7. Accessed on 22 November 2016.
4. DiBonaventure M, Wintfeld N, Huang J, Goren A, The association between non adherence and glycated hemoglobin among type 2
diabetes patient using basal insulin analogs. Patient prefer adherence 2014 Jun, 8:873-882.

5. Meichenbaum D, T. D. (2013). Facilitating Treatment Adherence: A Practitioner's Guide-book. New York: Plenum Press.

6. World Health Organization Updates Jan, 2015 global prevalence of diabetes

7. Arifulla, M., John, L. J., Sreedharan, j., Muttappallymyalil, J., & Basha, a. S. (2014). Patients’ Adherence to Anti-Diabetic Medications in a Hospital at Ajman, UAE. Malays J Med Sci, volume21 Num.1, pp. 44-49.

8. McDonald HP, G. A. (2011). Intervention to enhance patient adherence to medication. JAMA , pp. 2868-2879.

9. Awuni Prosper Mandela Amaltinga. Non Adherence to Diabetic Medication Among Diabetic Patients, a Case Study of Dormaa Hospital Ghana. Science Journal of Public Health . Vol. 5, No. 2, 2017, pp. 88-97. doi: 10.11648/j.sjph.20170502.15

10. Mesfin Y, Assegid S, Beshir M (2017) Medication Adherence among Type 2 Diabetes Ambulatory Patients in Zewditu Memorial Hospital, Addis Ababa, Ethiopia. Epidemiology (Sunnyvale) 7: 322. doi:10.4172/2161-1165.1000322

11. Mastewal Abebaw, Anteneh Messele, Mignote Hailu, and Fisseha Zewdu; Adherence and Associated Factors towards Antidiabetic Medication among Type II Diabetic Patients on Follow-Up at University of Gondar Hospital, Northwest Ethiopia ;Hindaw publishing corporation;Volume 2016, Article ID 8579157, 7pages.http://dx.doi.org/10.1155/2016/8579157

12. Gabriel Waari et al. The Pan African Medical Journal - ISSN 1937-8688. http://www.panafrican-med-journal.com/content/article/29/82/full/
13. Odume BB, Ofoegbu OS, Aniwada EC, Okechukwu EF. The influence of family characteristics on glycaemic control among adult patients with type 2 diabetes mellitus attending the general outpatient clinic, National Hospital, Abuja, Nigeria. South African Family Practice. 2015; 57(6): 347-52. Google Scholar

14. Al-Sharafi BA, Gunaid AA, Effect of habitual Khat chewing on glycemic control, body mass index, and age at diagnosis of diabetes mellitus in Yemen. Clin. Med. Insight Endocrinol diabetes 8(1), 47-53 (2015).

15. Noureddine H, Nakhoul N, Galal A, Soubra L, Saleh M (2014) Level of A1C control and its predictors among Lebanese type 2 diabetic patients. Ther Adv Endocrinol Metab 5: 43-52.

16. Z. Yekta, R. Pourali, M. R. Aghassi, N. Ashragh, L. Ravanyar, and M. Y. R. Pour, “Assessment of self-care practice and its associated factors among diabetic patients in urban area of Urmia, northwest of Iran,” Journal of Research in Health Sciences, vol. 11, no. 1, pp. 33–37, 2011.

17. I. G. U. Pascal, J. N. Ofoedu, N. P. Uchenna, A. A. Nkwa, and G.-U. E. Uchamma, “Blood glucose control and medication adherence among adult type 2 diabetic Nigerians attending a primary care clinic in under-resourced environment of eastern Nigeria,” North American Journal of Medical Sciences, vol. 4, no. 7, pp. 310–315, 201.