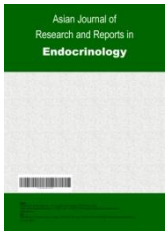

Asian Journal of Research and Reports in Endocrinology

5(2): 123-128, 2022; Article no.AJRRE.92843

Factors Influencing Patients' Adherence to Medication Therapy for Type-2 Diabetes Mellitus in the WA Municipality of the Upper West Region, Ghana

Elizabeth Gyabea Twumasi [a*], Sixtus Bieranaye Bayaa Martin Saana [a], Ahmed Wahab Obeng [a], Mariam El Boakye-Gyasi [b] and Frederick William Akuffo Owusu [b]

[a] Department of Pharmaceutical Sciences, Faculty of Applied Science and Technology, Dr Hilla Limann Technical University, Ghana.
[b] Department of Pharmaceutics, Faculty of Pharmacy and Pharmaceutical Sciences, Kwame Nkrumah University of Science and Technology, Ghana.

Authors' contributions

This work was carried out in collaboration among all authors. Authors EGT and FWAO designed the study wrote the protocol and wrote the first draft of the manuscript. Authors AWO and SBBMS managed the analyses of the study. Author MEBG proofread and managed the literature searches. All authors read and approved the final manuscript.

Article Information

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/92843

Original Research Article

Received 15 August 2022
Accepted 20 October 2022
Published 22 October 2022

ABSTRACT

Background: Diabetes Mellitus is a chronic condition that comes with life-threatening long-term complications due to defected Beta cells of the Islets of Langerhans; hence, adherence to medication plays a pivotal role to achieve a longer life expectancy among a population.
Objective: The aim of this study is to determine the factors that influence patients' adherence to their anti-diabetic medication therapy within the Wa Municipality.
Methodology: This is a cross-sectional study conducted in four health centers within the Wa Municipality between March to August 2022. Eighty diabetic patients using the Andrew Fisher's formula at 95% confidence interval were randomly selected, (35 men and 45 women; aged 15 years and above) administered questionnaires and the data obtained was analyzed.
Results: About 77.5% of participants adhered to their anti-diabetic medications while 22.5% did not adhere to their medications. Reasons cited for non-adherence included; lack of finance, feeling

**Corresponding author: Email: gyabeatwumasi@gmail.com;*

of drug being ineffective, taking a break from their antidiabetic medication after long periods of time, and also forgetting their medication while traveling.
Conclusion: Most of the participants adhered to their anti-diabetic medication therapy whiles factors such as lack of finance, forgetfulness, individual myths/beliefs, and inconsistent dosage regimen contributed to non-adherence.

Keywords: Adherence; anti-diabetic medication; type-2 diabetes mellitus; non-adherence.

1. INTRODUCTION

The International Diabetes Federation (IDF) confirmed in their tenth edition of the Diabetes Atlas that diabetes is one of the fastest-growing global health emergencies of the 21st century with an estimation of 537 million people living with diabetes worldwide and this number is likely to increase to 643 million by 2030. It has also indicated another cause for concern: The consistently high percentage (45%) of people with undiagnosed diabetes which was overwhelmingly type- 2 diabetes which is acquired compared to type 1 which is inherited [1]. It also reported that 329,000 adults between the ages of (20-79) years have diabetes mellitus in Ghana with about 6,255 diabetes-related deaths [1]. The World Health Organization (WHO) defines compliance with long-term therapies as "the extent to which a person's lifestyle; taking medications, following a diet, and/or executing lifestyle changes corresponds with agreed recommendations from a healthcare provider" [2].

The word compliance indicates that a patient conforms to or obeys physician instructions which denotes an authoritative nature whereas adherence describes a more independent, autonomous, and intelligent patient who takes more active and voluntary roles in defining and pursuing goals for their medical treatment usually in partnership with a health practitioner [3]. Previous studies have indicated that non-adherence to anti-diabetic medication could result in accelerated long-term complications, morbidity, mortality, and high economic crisis that can spike a public health issue [4,5,6]. No study has been documented within the Wa Municipality even though diabetes is a fast-rising global health emergency in the study area. Also, a systematic review considering interventions that could promote anti-diabetic medication therapy failed to achieve any positive results since all interventions employed did not improve HbA1c control [7]. A study conducted in Nigeria also indicated that only (44%) of participants on oral hypoglycemic agents had adequate glycemic control which the major issue was associated with adherence [8]. This study would allow the identification of key and major problems that affect adherence of anti-diabetic patients to their medication therapy within the Wa Municipality and the information obtained would help healthcare professionals provide protocols and interventions to address these issues for optimal health outcomes. Hence the study aims at indicating factors that influence patients' adherence to their anti-diabetic medication.

2. METHODOLOGY

2.1 Study Area

The study was conducted at four selected hospitals within the Wa Municipality located in the Upper West Region of Ghana. These hospitals deliver medical services to both in and outpatients within the Wa Municipality.

2.2 Study Design

This study was a cross-sectional study, where a descriptive research method was adopted, this study estimates the prevalence of adherence to antidiabetic medications among patients at the selected four health facilities. It focuses on evaluating the adherence to anti-diabetic medications among patients attending diabetes centers.

2.3 Study Population, Sample Size Calculation, and Technique

A simple random sampling technique was used for this study to select type 2 diabetic patients. The target population in this study is patients who have been attending the selected four health facilities for their medical review. The health facilities serve the population of diabetic patients in the Municipality. A sample size of 80 type 2 diabetic patients was calculated using Andrew Fisher's formula at a 95% confidence interval [9].

2.4 Study Variables

For this study, the dependent variable was the adherence status of the diabetes patients as

against the independent variable of the socio-demographic characteristics of the participants. Independent variables of the socio-demographic characteristics or factors including age, gender, religion, educational status, and marital status, can affect the adherence of type 2 DM patients. Other clinical characteristics (e.g., duration of the disease since diagnosis, number of drugs being taken, dosage form, and test performed,) may affect adherence.

2.5 Study Instruments

The instruments used for the data collection were semi-structured questionnaires.

2.6 Data Collection Procedures

The data collection was conducted after obtaining ethical approval from the Regional Health Directorate of the Upper West Region, Ghana and the management of all four health centres. For primary data sources, the study used questionnaires developed by reviewing different works of literature using simple English language. The data collection was conducted from 15th March to 10th August 2022 within Wa Municipality. It was in the form of collecting information which includes; socio-demographic characteristics of the patient like age, gender, religion, among others; clinical characteristics of the patient like duration of Diabetes Mellitus since diagnosis(year), and adherence status of the participants.

2.7 Procedure for Data Presentation and Analysis

The data collected from the field were processed and analysed using Microsoft Excel 2019.The data is presented as tables.

3. RESULTS AND DISCUSSION

3.1 Socio-Demographic Characteristics

The study included 80 diabetic patients visiting the four health centres for their medical review. Out of this number, the highest majority of respondents (48.75%) were between the ages of (46-60) with those above the age of (60) having the lowest (13.75%). Also from the study, more than half of the participants (56.25%) were females. In Tanzania, more than two-thirds of the population studied were females [8]. With regards to educational background, participants with no formal education and participants who have a tertiary education respectively made up the highest (38.75%), and participants with secondary education had the lowest numbers (7.5%) (Table 1). A similar study in a tertiary hospital conducted at Debre Makros in Ethiopia also had a majority of its participants being females (71.74%) and participants with no formal education (64.18%) were more likely to be diagnosed with diabetes [10]. The majority of the participants were married (56.25%) with just a few widowed (3.75%). A study conducted in Uganda also had the majority of their participants married (73.1) [4] (Table 1).

Table 1. Socio-demographic characteristics of respondents (n=80)

Characteristics	Frequency [n, (%)]
Age/yrs.	
15-30	14 (17.5)
31-45	16 (20)
46-60	39 (48.75)
> 60	11 (13.75)
Sex	
Female	45 (56.25)
Male	35 (43.75)
Education	
No formal education	31 (38.75)
Basic	12 (15)
Secondary	6 (7.5)
Tertiary	31 (38.75)
Marital Status	
Single	28 (35)
Married	45 (56.25)
Divorced	4 (6.25)
Widowed	3 (3.75)

3.2 How Long a Patient Has Been Living with Type 2 Diabetes Mellitus and Counselling on Medication upon First Diagnosis as a Diabetic Patient

The majority of the participants have been living with Diabetes Mellitus for the past decade. Participants with the highest frequency were between (1-5) years (53.75%) and (6-10) years (36.25%). Participants who have lived with diabetes between (21-25) years had the lowest frequency (1.25%). A greater number of participants (78.75%) had been counseled on their medication therapy while (21.25%) had no counseling on their medication therapy. A study conducted at Assela General hospital in Ethiopia had (28.8%) of participants expressing their dissatisfaction with their healthcare service

provider at their diabetic clinics with (17.9%) indicating that they only get counseled once in a while [11]. Healthcare providers especially pharmacists must make it a point to give special attention to patients who have been initially diagnosed with diabetes to fully educate them on how and when to take their medication and also lifestyle modifications that can be adapted to promote the effectiveness of their medication in controlling their blood glucose levels. Also, due to the fact that (38.75%) had no formal education, healthcare providers must put in place protocols such as bringing a healthcare provider in who understands their native language to fully counsel and educate them about their disease condition and how to effectively take their anti-diabetic therapy to achieve good blood glucose level outcomes (Table 2).

3.3 Adherence and Factors that Influence Non-Adherence

The majority of the participants constituting (77.5%) adhered to their anti-diabetic therapy, while the compliance rate in India and Kerala was (57.7%) and (37.5%) respectively [12,13]. A minority which was (22.5%) admitted they do not always adhere to their anti-diabetic medication therapy. In order to find solutions and develop protocols to reduce non-adherence to the minimum, the participants who admitted to non-adherence were further asked about some of the factors that could contribute to this. A large number of participants (66.67%) admitted that they take a break sometimes since they have been on the medication for a very long time (Table 3). This is very alarming and healthcare professionals must enforce education on Diabetes Mellitus for patients to understand that it is chronic and their blood glucose levels would need assistance from these medications to achieve optimum control and insist that they can't take breaks at their own convenience while further counseling them on some of the negative impacts this could have on their health. A study conducted in a Ghanaian teaching hospital confirmed the fact that about (80%) of respondents answered affirmatively to the fact that complications pose a severe threat to their health [14]. Hence, educating patients on long-term complications and making adherence to drug therapy the ultimate solution to curb or retard complications would motivate them to adhere to their anti-diabetic drug therapy [15].

A similar study conducted in a Hospital in Ajman, United Arab Emirates [3] and two regional hospitals in Cameroon [16] also indicated lack of finance (23.8%) and (34%) respectively as the second highest factor that influences patient adherence. However, the percentage was much higher for this study (61.11%). The best way to address this is for the government to consider policies where anti-diabetic medications would be free and accessible to all diabetic patients both at the community pharmacies and in the hospitals. Most of the participants also felt that even if they take the medication, it would be ineffective (55.56%). Education and counseling patients about the normal ranges for fasting/ non-fasting blood glucose levels and evidently showing their high levels to them immediately after they are diagnosed coupled with teaching them how to use the glucometer to monitor their blood glucose level while on the medication would take away the myth/belief that their anti-diabetic medications do not work. Once their confidence is boosted, they would be encouraged to take their anti-diabetic medication.

Table 2. How long participants have been living with type 2 diabetes mellitus and whether participants were counselled on their medication therapy (n=80)

Variables	Frequency [n, (%)]
Duration of diabetes mellitus/ yr.	
(1-5)	43 (53.75)
(6-10)	29 (36.25)
(11-15)	2 (2.5)
(16-20)	2 (2.5)
(21-25)	1 (1.25)
(26-30)	0
Over 31	3 (3.75)
Have you ever been counselled on your medication therapy?	
YES	63 (78.75)
NO	17 (21.25)

A higher proportion of participants (55.56%), forgot their medication when traveling. The way to minimize this moving forward is to let diabetic patients invite guardians to their counseling and education especially in the hospitals if these sessions could be organized quarterly. This step would give guardians insight into what their families / loved ones are suffering from and motivate them also to help them cope with the disease. Once this is done the families and loved ones would not only remind them to take their medications only when they

Table 3. Adherence (n=62) and possible factors that could influence non-adherence (n=18) in participant

Variables	Frequency [n (%)]
Adherence	62 (77.5)
Non-adherence	18 (22.5)
Factors that could possibly influence non-adherence (n=18)	
Social/Economic factor	
Lack of finance	11 (61.11)
Patient-related factors	
Feeling drug is ineffective	10 (55.56)
Take a break sometimes since I have been on anti-diabetic medication for ages	12 (66.67)
Forgetfulness	7 (38.89)
Stop taking medication after I have felt better for some time	6 (33.33)
Forget medication when travelling	10 (55.56)
Do you make modification to the dose prescribed	5 (27.78)
Do you know the importance of your anti-diabetic medication?	5(27.78)
Therapy-related factors	
Dosage regimen does not coincide with meal plan	6 (33.33)
Can't tolerate side effects	8 (44.44)
Dislike size of dosage form	7 (38.89)
Difficulty due to dosage regimen	7 (38.89)
Multiple medication	4 (22.22)
Sometimes miss dosing times	7 (38.89)
The unpleasant taste of medicine	7 (38.89)
Do you know the importance of your anti-diabetic medication?	10 (55.56)
Provider-patient factor	
Did your pharmacist counsel you on what diabetes is?	10 (55.56)

are traveling but even when they are around them performing their day-to-day activities as well.

Some of the minor factors why participants were not adhering to their anti-diabetic medications included the unpleasant taste of the medication, dosing, and dosage regimens, size of dosage form, multiple medications, etc. This could be addressed by investigating new pharmaceutical approaches to the manufacturing of these anti-diabetic medications whiles making them affordable in the process (Table 3).

4. CONCLUSION

The majority of the diabetic patients living within the Wa Municipality adhered to their anti-diabetic medication therapy. The few who did not adhere can be attributed to a lack of finance, the feeling that the medications they were taking were ineffective, forgetting their medication whiles traveling, and taking a break from their medication sometimes since they had been on it for a long period of time.

CONSENT

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

Ethical approval to conduct this study was obtained from the Regional Health Directorate and the administration of all the four-health centers.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Federation ID. IDF diabetes atlas, tenth. [Access on 2022 Sep 14]. Availabile:https://www.diabetesatlas.org/idfawp/resource files/2021/IDF_Atlas_10th_Edition_2021
2. World Health Organization. Towards the solution. In: Adherence to long-term therapies. Ninth edition. 2021;1–11.
3. Gould E, Mitty E. Medication adherence is a partnership, medication compliance is not. Geriatric Nursing. 2010;31(4):290-298.
4. Arifulla John M, Basha SA, Muttappallymyalil LJ, Sreedharan J. Patients' adherence to anti-diabetic medications in a hospital at ajman, UAE. The Malaysian Journal of Medical Sciences: MJMS. 2014;21(1):44.
5. Bagonza J, Bazeyo W, Rutebemberwa E. Adherence to anti-diabetic medication among patients with diabetes in eastern Uganda; a cross-sectional study. BMC Health Services Research. 2015;15(1):1-7.
6. Boon H, Fenta TG, Habte BM, Kebede T. Barriers and facilitators to adherence to anti-diabetic medications: Ethiopian patients' perspectives. African Journal of Primary Health Care & Family Medicine. 2017;9(1):1-9.
7. Aslani P, Brien JA, Greenfield J, Sapkota S. A systematic review of interventions addressing adherence to anti-diabetic medications in patients with type 2 diabetes—impact on adherence. PloS One. 2015;10(2),e0118296.
8. Joseph BY, Obe O, Yusuff KB. Adherence to anti-diabetic drug therapy and self-management practices among type-2 diabetics in Nigeria. Pharmacy World & Science. 2008;30(6):876-883.
9. Amoabeng IA, Borquaye LS, Darko G, Otoo BA. Disposal of unused and expired medicines within the sunyani municipality of Ghana: A cross-sectional survey. Journal of Environmental and Public Health; 2022.
10. Rwegerera GM. Adherence to anti-diabetic drugs among patients with type 2 diabetes mellitus at muhimbili national hospital, dar es salaam, Tanzania-a cross-sectional study. The Pan African Medical Journal. 2014:17.
11. Abebaw A, Abebe D, Bahiru B, Belayneh A, Biyazin Y, Getachew M, Mengist HM, Mitiku Y, Kebede B, Tegegne BA. Prevalence of medication non-adherence and associated factors among diabetic patients in a tertiary hospital at debre markos, northwest Ethiopia. Ethiopian Journal of Health Sciences. 2022;32(4): 755.
12. Gashe F, Kassahun A, Mulisa E, Rike WA. Nonadherence and factors affecting adherence of diabetic patients to anti-diabetic medication in assela general hospital, oromia region, Ethiopia. Journal of Pharmacy & Bioallied Sciences. 2016; 8(2):124.
13. Bhattacharyya A, Das KK, Deb A, MuKherjee S, Sharma SARKAR B. Compliance to anti-diabetic drugs: Observations from the diabetic clinic of a medical college in kolkata, India. Journal of Clinical and Diagnostic Research: JCDR. 2013;7(4):661.
14. Boban B, Marimuthu K, Murali AB, Shanmughan AK, Sreelatha AR, Xavier A. Medication Therapy Management (MTM): An innovative approach to improve medication adherence in diabetics. Drug Metabolism and Personalized Therapy. 2016;31(3):151-155.
15. Acheampong F, Bruce SP, Kretchy I. Adherence to oral anti-diabetic drugs among patients attending a ghanaian teaching hospital. Pharmacy Practice. 2015;13(1).
16. Aminde LN, Aminde JA, Fondong AA, Ngwasiri CA, Njim T, Takah NF, Tindong M. Adherence to anti-diabetic medication and factors associated with non-adherence among patients with type-2 diabetes mellitus in two regional hospitals in Cameroon. BMC Endocrine Disorders. 2019;19(1):1-9.

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/92843