[Review Article] Assessment of Non-adherence to Antidiabetic Medication and Its Associated Factors in Context of Developing Countries

Fikadu Seyoum[1]

1 Ambo University

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Abstract

Background: Globally, diabetic mellitus affects more than 285 million people. Individuals with diabetic mellitus are highly susceptible to various acute and chronic complications of the disease. Hence, effective management with lifestyle modification and various pharmacological treatments is paramount to preventing morbidity, mortality, and economic costs. However, only a few patients achieve the target glycaemic control due to poor medication adherence habits. Poor adherence to antidiabetic medications is the single most important reason for uncontrolled diabetes, serious complications, and the wastage of health care resources in developing countries like Ethiopia.

Objective: The main objective of this review is to assess non-adherence to antidiabetic medication and its associated factors in the context of Ethiopia.

Study Design: Retrospective study design has applied to collect secondary data from related publications online.

Method: Electronic databases, including Web of Science, Google Scholar, MEDLINE, Scopus, and the Cochrane Library, used to systematically search without limitation of publication date and status.

Result and conclusion: In a limited health care system like Ethiopia, low diabetic education, economic instability, low literacy levels, and restricted access to healthcare facilities are among the factors contributing to the increased incidence of medication non-adherence among known diabetic patients. Additionally, self-management practice is generally low among diabetic patients in low-income countries like Ethiopia. This implies a critical need for educational empowerment. A number of motivations, such as scheduled home visits by health workers to evaluate and strengthen adherence to medications, sound important. Furthermore, strategies including viable cost reduction medications and encouraging low-priced, high-efficacy drugs may increase patient access to anti-diabetic.

Fikadu Seyoum Tola

Department of medical Biochemistry, College of medicine and referral hospital Ambo University, Po. Box, 19, Addis Ababa, Ethiopia. Email: fikishzgreat21@gmal.com

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1. Introduction

Diabetic mellitus (DM) is a heterogeneous group of metabolic disorders characterized by a common phenomenon called hyperglycaemia. The etiologic and casual association of the disease involve genetic basis, unhealthy diet, reduced physical activity, extreme obesity, and family history of previous diabetes mellitus, aging, and others. Individuals with diabetic mellitus are highly susceptible to various acute and chronic complications, some of which include peripheral neuropathy, nephropathy, retinopathy, cardiovascular diseases, and reduced resistance to infections [1]

Effective management of patients with diabetic mellitus includes lifestyle modifications and various pharmacological treatments to prevent morbidity, mortality, and substantial economic loss. However, only a few patients with diabetes mellitus achieve the target glycaemic control due to poor medication adherence habits. Adherence is explained as the extent to which a patient's behavior regarding a healthy diet, healthy lifestyle, taking medication or behavior change is consistent with health advice. The lack of adherence to drugs according to physician prescription has consistently been shown to be associated with poor glycaemic control, which led to devastating morbidity and mortality [2].

Even though adherence to antidiabetic therapy is a common serious health concern worldwide, developing countries are highly affected by non-adherence. Medication non-adherence could be related to healthcare system factors, patients' factors, or medication conditions. In developing countries, non-adherence to antidiabetic medications is becoming a principal factor, followed by deleterious consequences for patients and the community as a whole [3].

Globally, full compliance with treatment for chronic disease is expected to be 50%, and this is far less in developing countries like Ethiopia. Therefore, medication adherence is a major concern and a huge burden on our health system. In a limited health care system like Ethiopia, the dominance of economic instability, low literacy levels, and restricted access to healthcare facilities are some of the factors that may have led to an increase in the incidence of medication non-adherence [4]

2. Data source and searching strategies

Electronic databases including Web of Science, Google Scholar, MEDLINE, Scopus, and Cochrane library were used to systematically search without limitation of publication date and status. Observational, retrospective cohort, prospective case-control, cohort studies, cross-sectional studies, and clinical trials were included

3. Ethics and Disseminations

The protocol of the review does not require ethical approval because it does not involve humans. This article will be published in a peer-reviewed journal and presented at relevant conferences.

4. Prevalence and some associated complication of diabetic mellitus disease

Diabetes mellitus refers to a group of common metabolic disorders that share the phenotype of chronic hyperglycemia due to a defect in insulin secretion, insulin action, or both. Globally, the prevalence of diabetes mellitus was estimated to be around 463 million in 2019. Chronic disease is currently the major issue in developing countries. Ethiopia faces an increasing prevalence of DM and has become the third country in Africa in terms of DM burden, with a national prevalence of 3.2 percent [5]. Diabetes mellitus itself is estimated to be associated with 11.3% of global deaths. The economic impact of diabetes is expected to continue to grow, and it is projected that expenditures will reach 845 billion United States dollars by 2045 [6]

Diabetic mellitus and its complications are also a major public burden that cause long-term hospitalization and poor quality of life. The disease is highly increasing in developing countries and imposing huge economic waste. Diabetic foot ulcers are one of the major causes of mortality and morbidity, with related devastating complications [7].

Globally, the prevalence of diabetic retinopathy among diabetic patients is estimated to be 27.0%, which leads to 0.4 million blind people in the world. According to a study done in Northwest Amhara Comprehensive Specialized Hospitals, Northwest Ethiopia, the prevalence of diabetic retinopathy among type 2 diabetes patients was 36.3%. Therefore, diabetic retinopathy is the cause of irreversible blindness in adults of working age among diabetic patient [8].

Additionally, DM patients with comorbidities took multiple medications to treat these coexisting diseases. Multidrug use creates complicated dosing schedules that are likely to result in low adherence to the medication plan. According to various study reports, there is poor antidiabetic drug adherence, among which are a complex medication schedule, a high cost of treatment, fear of adverse effects, a lack of belief in the treatment, psychological problems, age, medication knowledge, co-morbidities, and the nature of the clinical setting [9].

5. Factors contributing to non-adherence of antidiabetic drug among diabetic patient in Ethiopian context

According to one study, the prevalence of depression among Ethiopian diabetic patients was estimated to be 34.61%. Females are more likely to suffer from depression than males during their lifetime. This discrepancy might be due to environmental, hormonal, or genetic factors. Depression is therefore the cause of poor antidiabetic drug compliance in these patients. Hypertension among type-2 DMs ranges from 32% to 82%. Hypertension is also one of the main global burdens, estimated to cause 7.5 million deaths. Therefore, having comorbid conditions like hypertension is another factor

that increases non-adherence to antidiabetic medication among diabetic patients [8][10].

Ensuring patients' adherence to antidiabetic medications to prevent complications of diabetes remains a major challenge to public health in many developing countries. Non-adherence to medication is potentially one of the most serious problems facing diabetes care delivery, particularly in type 2 diabetes. Poor adherence to medications is the single most important reason for uncontrolled diabetes, serious complications, and the wastage of health care resources [11]

A study was conducted to find out how older adults with uncontrolled type 2 diabetes mellitus felt about taking their medications as prescribed. The main factors influencing antidiabetic medication adherence, according to this study, are knowledge of the disease condition and drugs, attitude toward drug adherence, self-medication and dosing, bad experience with medication, multiple drugs, change in lifestyle, negligence, motivation, family support, support from health workers, availability of facilities, and financial capability. Age-related memory loss, visual disturbances, and physical weakness are among the variables that make it more difficult for older adults to take their anti-diabetic drugs as prescribed [12][13].

A study conducted at Ethiopia's Adama Medical College found that a small percentage of type-2 DM patients take their medications as prescribed. According to this study, characteristics linked to good medication adherence include being married, working for the government, not drinking alcohol, not having any comorbidities, and receiving diabetic health education at a medical facility. This study suggests that health professionals should emphasize the value of diabetic medication adherence during every follow-up appointment [14].

Another descriptive study was done in Ethiopia at Assela General Hospital to assess non-adherence and factors affecting the adherence of diabetic patients to anti-diabetic medication. In this study, the prevalence of non-adherence is 31.1% (moderate adherence). Factors including drug side effects, complexity of regimen, failure to remember, educational level, and monthly incomes are significantly associated with poor medication adherence among diabetic mellitus patients. This can be explained by the perception that participants who had more medications perceived themselves as severely ill and hoped less to cure chronic diseases like diabetes mellitus [15].

Another cross-sectional study was done to assess medication adherence and its associated factors among diabetic patients at Zewditu Memorial Hospital, Addis Ababa, Ethiopia. The study revealed that low educational levels have been associated with higher rates of non-adherence. Patients with low knowledge about diabetes are five times more likely to be non-adherent as compared to patients who had knowledge about diabetes. Because being illiterate makes learning more difficult, as diabetes drug therapy gets more complex. Additionally, the unavailability of medications in health institutions has a negative impact on patient adherence, especially when it is accompanied by low economic status. Because the patient cannot afford to buy medication from the private sector, where medications are usually costly [16].

The study from Palestine found that non-adherence among diabetic patients toward their drug is 42.7percentage. According to this study, most diabetic patients strongly believe that anti-diabetic medications are necessary for their current and future health. However, they highly concerns about the adverse consequences of taking anti-diabetic medications on a regular basis. Patients with DM perceived that their medications may pose addiction and has no

acceptable safety profile for long-term use. Finally, improving the knowledge of diabetic patients about their illness can positively influence their medication adherence and therapeutic outcome [17].

Another medication adherence and associated factors study was done among diabetic patients in the Eastern Zone of Tigray, Northern Ethiopia. This study shows that out of 321 study participants, 63.9% of the patients were non-adherent to their medications. The study highlights that better monthly earnings, nearby health-care accessibility, fewer prescribed medications, and getting appropriate counselling about diabetes mellitus were predictive of adherence to medications. This could be because those who earn more are more likely to have better medication use information; they are more likely to pay for their own medication-related expenses; and they are able to pay for different sources of medication information like televisions, radios, magazines, and books. If a patient has a poor economic base, this will inevitably lead to inadequate access to health care and self-care practices, and overall, it will lead to a poor diabetic outcome [18].

There was a study on barriers and facilitators to adherence to anti-diabetic medications: Ethiopian patients' perspectives. Religion is another factor associated with non-adherence to antidiabetic medication among diabetic patients in Ethiopia. Among Ethiopian Orthodox, the use of holy water instead of the prescribed drug, like injectable insulin, is common practice. Fasting is another practice among orthodox, protestant, and Muslim communities. Fasting led to a reduction in the dose of the drug, whereas it led to a modification of the time schedule for other drugs. Taking their insulin injection without food may lead to hypoglycemia due to non-adherence to the prescribed dose and diet [19].

The length of time after encountered disease is another factor that significantly associated with adherence status in diabetic patients. Additionally patients with DM>=3yrs were more likely adhere to their medication than patients whose disease diagnosis is less than 3yrs age

The possible justification for duration may be due to that patients with longer duration might have several contacts with health care provider. Hence, health professional give them repetitive instruction on their medication adherence and become more aware of the acute and chronic complications of the disease. The wider social interaction at health facilities with other diabetic patients regarding medication adherence is another factor enhance adherence [20]

According to a study from Uganda on the prevalence and factors associated with non-adherence among diabetic patients, Duration of diabetes for more than 5 years since diagnosis was significantly associated with non-adherence to antidiabetic mediation (AOR = 1.87, 95% CI = 1.034-3.391, P = 0.038). This may be due to the stress, anxiety, and fear that patients experience during the early stages of the disease and become less committed to drug adherence [21].

Another cross-sectional study was done to assess medication adherence in diabetes mellitus and self-management practices among type-2 diabetics in Ethiopia. In this finding, the main external challenge of adherence to antidiabetic drugs is a financial problem (prevalence of low financial status, 37.1%). Ethiopia is one of the resource-limited countries where the majority of the population is estimated to live below poverty levels, so economic access to anti-diabetic medication appears restricted by the average monthly cost of 32.7 birr ($2.0) [22].

This causes the cost of other adjunctive therapy, such as antihypertensive drugs, required by the majority of patients. The strategies of viable cost reduction medications, encouraging low-priced high-efficacy drugs, strengthening the provision of

subsidy by the government, and collaborating with donor agencies may increase patient access to the needed anti-diabetic medications, which improves adherence. Additionally, self-management practice was generally low among diabetic patients in low-income countries like Ethiopia. This implies a critical need for educational empowerment. This could be done with the use of a number of motivational strategies, such as scheduled home visits by health workers to evaluate and strengthen adherence to medications. Self-management practices, peer education and experiences through patient support groups, and confidential counselling by health professionals, with each focusing on specific issues pertaining to their contributions to the diabetes care process that minimize non-adherence [22][23]

Being of poor socioeconomic status plays a great role in non-adherence to the medication. Individuals who are not economically fit cannot access education, information, transportation, or drugs on time. All of this makes it more difficult for patients to adhere to their diabetes treatment regimen. If patients perceive the cost of drugs as a financial burden, their adherence to therapy will be compromised [24].

Diabetic education is another important factor associated with compliance with their medication. In diabetic management, continuity and repetition of diabetic self-management education are important. Successful diabetic education includes treatment options, the importance of diet and exercise, blood glucose monitoring, managing unexpected situations, and recognizing and preventing complications. The challenge is that individuals with diabetes usually do not return for follow-up visits and cannot monitored by their health care providers. The low level of education itself negatively influences the belief in the importance of diabetic education. As the study revealed, group education is more effective in improving glycaemic control and economical than individual diabetic education. Therefore, efforts for generalization and standardized education for all diabetic patients are highly important to minimize non-adherence to their medications [25][26].

6. Conclusion

Medication adherence is a major concern and a huge burden in our health system. In a limited health care system like Ethiopia, the dominance of economic instability and restricted access to healthcare facilities are some of the factors mentioned. Therefore, poor adherence to medications is the single most important reason for uncontrolled diabetes, serious complications, and wastage of health care resources.

Several factors affect the adherence to antidiabetic drugs among diabetic patients. Diabetic patients with comorbidities took multiple medications to treat these coexisting diseases. Multidrug use creates complicated dosing schedules that are likely to result in low adherence to the medication plan. Furthermore, patients who had more medications perceived themselves as severely ill and hoped less to cure chronic diseases like diabetes mellitus.

Low literacy levels are associated with non-adherence. Because being illiterate makes learning more difficult. As diabetes drug therapy gets more complex, it becomes difficult to understand the prescribed drug therapy and to adhere to treatment for good glucose control.

Religion is another factor associated with non-adherence to antidiabetic medication among diabetic patients in Ethiopia. Among Ethiopian Orthodox, the use of holy water instead of the prescribed drug, like injectable insulin, is common practice. Fasting is another practice among orthodox, protestant, and Muslim communities. Fasting led to a reduction in the dose of the drug, whereas it led to a modification of the time schedule for other drugs. Taking their insulin injection without food may lead to hypoglycemia due to non-adherence to the prescribed dose and diet. Low economic status is also another factor. Because the patient cannot afford to buy medication from the private sector, where medications are usually costly

Therefore, efforts for generalization and standardized education for all diabetic patients are highly important to minimize non-adherence to their medications. A number of motivational strategies, such as scheduled home visits by designated health extension workers to evaluate and strengthen adherence to medications and self-management practices, and confidential counselling by health professionals, are very important. Diabetic education is another important factor associated with compliance with their medication. In diabetic management, continuity and repetition of diabetic self-management education are important.

Statements and Declarations

Data Availability

The data supporting this review article are from previously reported studies and datasets, which have been cited.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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There is no funding source to report

Ethics and Disseminations

The protocol of the review does not require ethical approval because it does not involve humans. This article will be published in a peer-reviewed journal and presented at relevant conferences.

Informed consent

Not applicable

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