

## Research Article

# Antihypertension medication adherence and associated factors at Dessie Hospital, North East Ethiopia, Ethiopia

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## ABSTRACT

Hypertension is an overwhelming global challenge. Despite the development of many effective anti hypertensive drugs, target to reduce morbidity and mortality due to high blood pressures are reached in only a minor of patients in clinical practice. Poor adherence is one of the biggest obstacles in therapeutic control of blood pressures. There are complaints from patients and physicians that the poor result of actual antihypertensive drug therapies. Many people with age indifference are attacked by this “silent killer” or which results in target organ damage as a complication. The aim of this study was to assess the magnitude of adherence and the factors associated with non-adherence to anti-hypertensive medication. Cross sectional exclusively convenient study was conducted by using structured questionnaires consisting of open and closed-ended questions on patients diagnosed for hypertension and have already been on anti hypertensive medications at least for three months at Dessie Referral hospital from 20/01/2012 to 29/01/2012. A total of hundred hypertensive patients were screened from hundred six cases by the exclusive criteria and the overall incidence of anti-hypertensive medication non adherence was 26%. The study identifies reasons why patients don't adhere with the drug regiments. Among Factors associated with non adherence were health system and health care provider poor interaction with patient and therapy factors like frustration and unwanted effect of the medication in the long run. There was indication of non adherence from the study area. Great emphasis should be placed on intervention strategies such as patient counseling and increasing awareness of the physicians, all other prescribers and health care providers at large about the non adherence of anti hypertensive drugs as well as the complication what comes due to this medication non adherence.

**Keywords:** Non-adherence, Compliance, Long term therapy, Dose missing, Medication refill, Target organ damage, Cardiovascular risk factors, Patient-physician interaction

## INTRODUCTION

Patients' medication adherence is influenced by a large number of interacting factors but their exact impact is not well understood, partly because it is difficult to measure adherence. Obtaining a medicine does not ensure its use;

however, it has been established that patient self report is a useful marker of adherence.<sup>1</sup>

Uncontrolled high blood pressure increases individual's risk of heart disease and stroke. High blood pressure is one of the most prevalent chronic diseases for which

treatment is available. Once anti-hypertensive drug therapy is initiated, most patients should return for follow-up and adjustment of medications at approximately monthly intervals.<sup>2</sup>

Studies worldwide indicate that despite the availability of effective medical therapy, over half of all hypertensive do not take any treatment and more than half of those on treatment have blood pressures over the 140/90 mmHg threshold. The World Health Organization (WHO) describes poor adherence as the most important cause of uncontrolled blood pressure and estimates that 50-70% of people do not take their antihypertensive medication as prescribed. Adherence is defined by WHO as "the extent to which a person's behavior-taking medication, following a diet, and/or executing lifestyle changes-corresponds with agreed recommendations from a health care provider". Adherence is dependent on numerous factors and has been shown to vary from 0 to 100% in different populations studied. Factors such as age, gender, low socioeconomic status and severity of disease, class of drug prescribed, number of pills per day, side effects of medication, patient's inadequate understanding of the disease and importance of the treatment, co-morbid medical conditions, lack of social support, poor patient-provider relationship, cost, forgetfulness, and presence of psychological problems, especially depression have all been shown to affect adherence in various populations.<sup>3</sup>

Medication adherence has been defined in terms of an agreement between the patient's behavior of taking medications and the clinical prescription. Adherence or non-adherence with medications may include errors of purpose, timing or dosage as well as total or partial omission, or use of inadvertent combinations. Non-adherence with medications is one of the major factors in the failure of therapeutic programs in patients having a chronic disease. It is true that the possible factors of non-adherence may vary from country to country and may contribute to the variations that exist among the reported values of non-adherence. With regard to the possible factors of non adherence that are related to the patient, the disease, the drugs prescribed by the physician and the treatment environment. The magnitude of non-adherence is expected to be high in Ethiopia. Nevertheless, few studies are conducted to address such an important public health issue in Ethiopia.<sup>4</sup>

Recent guidelines emphasize the importance of blood pressure control to reduce cardiovascular morbidity and mortality. However, control of blood pressure among hypertensive patients remains low – at approximately 13% in the UK. One of the reasons for this is poor adherence with therapeutic regimens.<sup>5</sup>

Antihypertensive medication non adherence said to be a silent disease in America because of the large amount of non-adherence to medications routinely in acute care situations. Not only is this a clinical problem in terms of patient outcomes, but also it has serious economic

consequences for a country. So, indeed, adherence, when looked upon as a disorder, is a very serious clinical and economic problem.

As the current data screen actually suggests, that adherence is getting worse, not better. New data from the Center for Health Transformation claims the annual cost of patients not taking their medicines as prescribed. Nearly 125,000 patients dying each year due to poor adherence in America.<sup>6</sup>

Despite the availability of effective medical therapy, over half of all hypertensive patients do not take any treatment and more than half of those on treatment have blood pressures over the 140/90 mmHg threshold. The World Health Organization (WHO) describes poor adherence as the most important cause of uncontrolled blood pressure and estimates that 50-70% of people do not take their antihypertensive medication as prescribed. It has been well documented that uncontrolled blood pressure increases the risk of ischemic heart disease 3-to 4- fold, the overall cardiovascular risk by 2-to 3-fold and the incidence of stroke is increasing.<sup>7</sup>

Poor adherence may be partially due to problems of access and cost of medication, however, patients' beliefs about HTN and medication may also play a significant role. In a national survey, hypertensive patients reported that they discontinued antihypertensive therapy because they believed that they were cured (46%) and thought that they had been advised to stop by their provider (25%). Patients' non adherence to medications has been attributed to both intentional (i.e., a conscious decision not to take medications) and unintentional (i.e., a failure to take medications due to poor understanding or forgetfulness) reasons. And yet, providers may be unaware of patients' medication-taking behavior and patients' understanding of how to use medications. Without this information, it is difficult for providers to distinguish between drug efficacy problems and medication adherence issues. Effective communication is a key to providers' assessment of patients' adherence to medications.<sup>8</sup>

Nevertheless, few studies are conducted to address this important public health issue in Ethiopia there are many studies have been done across Africa and in the world at large.<sup>4</sup>

Even if many studies have been done across the world, successful result has not been obtained to get a good change in adherence to antihypertensive medication. So that factor which hamper the change or that greatly contributes to non adherence had been identified for proper intervention and the complication of hypertension, because of non adherence to its medication, like cardiac ischemia, congestive heart failure had to be reduced after proper recommendation. Antihypertensive medication adherence would be increased with consistency for the betterment of the productive society so that this study

was conducted. The main objective was to assess antihypertensive medication non adherence and factors influencing adherence among hypertensive patients at Dessie referral hospital, Northeast Ethiopia, 2012 about a change for the above problems. Therefore, the main objective of this study was to assess antihypertensive medication non adherence and factors influencing adherence among hypertensive patients at Dessie referral hospital, Northeast Ethiopia, 2012.

## METHODS

Data collection was conducted from January 20, 2012 to January 29, 2012, at Dessie referral hospital, region 3 North East Ethiopia, about 400km to the north from Addis Ababa. The climate condition of Dessie town is to the vicinity of low temperate area and located latitude of 11°8'N and longitude of 39°38'E with an elevation between 2470m and 2550m (8104ft) above sea level with the zonal total population of 2.95 million. Dessie town has 32 pharmacy premises, one government referral hospital, three private hospitals and five health centers. The governmental hospital was established in 1961 G.C (around 1954E.C), it is the center for all people around the town and provinces from other region and serves for more than 7 million people (Source: statistical office of South Wollo).

### Study design

A cross sectional exclusively convenient study design was conducted on hypertensive patients' antihypertensive medication adherence and on those factors influencing drug adherence by using questionnaires consisting of open and closed ended questions as well as individual's pills were counted for strengthen the result.

### Populations

**Source population:** All hypertensive patients who attend the hospital during the study period at Dessie referral hospital were source of study population.

**Study population:** All the hypertensive patients found at Dessie referral hospital during data collection and those are fulfilling the criteria were included.

### Sample size and sampling technique

Patients found during the study period at the study area who fulfil the criteria were included in the study exclusively for anti hypertensive medication adherence at Dessie referral hospital January 2012.

#### Inclusion criteria:

- Age greater than 18 years old.
- Patients who have started antihypertensive medication at least for the last three months were included.

- Hypertensive patients who were willing to respond.
- Patients who had the left over pills at the time and/or complete the whole dispensed pills.

#### Exclusion criteria:

- Mentally unstable hypertensive patients.
- Age less than 18 years old.
- In volunteer to respond the questionnaire
- Newly diagnosed and start the 1<sup>st</sup> regimen of treatment less than three months.
- Patients those didn't brought the pills were not considered.

### Study variables

#### Dependent variable

- Non adherence to antihypertensive medication.

#### Independent variables

- Age
- Sex
- Patient factors
- Therapy factors
- Socioeconomic factors
- Condition factors
- Health care provider & health system factors

### Data collection instruments

Open and closed ended questionnaires, pens and pencils with eraser, spoon & tablet counter were used for data collection.

### Data collection technique

Structured questionnaires consisting of open and closed ended questions on the antihypertensive drug adherence were distributed to patients for those found on the study area at time of data collection and the left over pills of individual patient were counted to strengthen the consistency of the research.

### Data processing and analysis

After collecting data it was processed using statistical package for social services (SPSS 19.0). Adherence and non adherence was calculated by the percentage of total missed doses over the total dispensed medications and at a cut off value of  $\geq 80\%$  was considered as adherence to their antihypertensive medication. Chi-square (p-value) was used to see determine the level of significance whereas, the association between adherence and different categories of independent variables was determined by logistic regression.

**Data quality assurance**

Pretest was conducted to check the feasibility of the method and the necessary modification was made to assure the systematic approach has some inconveniency.

**Ethical consideration**

Prior to data collection, official letter was obtained from department of pharmacy in order to get permission from the administrative office of the health facility and verbal consent was obtained from the patients for their willingness before proceeding to data collection. The name of the patient was not mentioned and the entire secret was kept for patient confidentiality.

**RESULTS**

A total of 100 hypertensive patients were screened out of 106 cases. Six of the respondents were excluded by the exclusion criteria that is patients with newly diagnosed for hypertension and medication initiation was not greater than a month and two months. And also patients who didn't bring the left over pills were not considered for the study. So that the response rate was 94.3% and the overall non adherence rate was 26% (Table 3). There were 61.54% Muslim and 38.46% Christian population from non adherent group, the religion has an association with non adherence having statistical significant, (P=0.013). There is no age, educational level, and sex and income association with non adherence. But factors associated with non adherence were poor health care provider and health system relation to the patient 30.8% (P=0.023) and therapy related factors associated with unwanted effect (due to some side effect of medication) 30.8% (P=0.009) as detailed seen in the following tabular results.

**Table 1: Socio demographic characteristic of the hypertensive patients at Dessie referral hospital chronic illness center, January 2012, Ethiopia.**

| Age group    | Gender         |                |
|--------------|----------------|----------------|
|              | M N (%)        | F N (%)        |
| 30-34        | 2(2.9)         | 4(12.9)        |
| 35-39        | 2(2.9)         | 1(3.25)        |
| 40-44        | 1(1.45)        | 2(6.45)        |
| 45-49        | 12(17.4)       | 8(25.81)       |
| 50-54        | 12(17.4)       | 3(9.7)         |
| 55-59        | 11(15.94)      | 9(29.03)       |
| 60-64        | 9(13.04)       | 1(3.25)        |
| ≥65          | 20(29)         | 3(9.7)         |
| <b>Total</b> | <b>69(100)</b> | <b>31(100)</b> |

The mean age of respondents was 53.88±10.12 with 69 male and 31 female known hypertensive cases (Table 1).

The non adherence value according to age group distribution was also depicted in Table 2. Most of patient's were mentioned in more than one factor for non adherence to clinical prescription of anti hypertensive medication. Deficient of enough information from the physician, pharmacist and unwanted effect of the drug and interrupting when pain had not been felt account almost of the total factors of non adherence. Most of non adherent hypertensive patients (84.73%) from the total non adherence were taking 2 types of drugs (CCB+TDU) and only 11.67% were taking 3 types of drugs (ACEI+TDU+LDA) the rest 3.60% were taking only one type of drug (CCB).

**Table 2: Educational levels of the study patients at Dessie referral hospital chronic illness center, January 2012, Ethiopia.**

| Educational level                | N (%)          | N (%)          |
|----------------------------------|----------------|----------------|
| Graduate                         | 16(23.2)       | 8(25.81)       |
| High school                      | 20(29)         | 10(32.26)      |
| Primary school                   | 6(8.7)         | 4(12.9)        |
| Can read and write & illiterates | 27(39.1)       | 9(29.03)       |
| <b>Total</b>                     | <b>69(100)</b> | <b>31(100)</b> |

From the whole respondents there is no age group below 30 years old and there were 69% male and 31% female cases. The mean age was 53.88±10.12(SD=10.12) the minimum age was 30 and the maximum age was 72 years old. Majority of the cases were male (69%) and most of the cases were in age group of ≥65 years and majority of female patients were in age group 55-59 this shows as the age increases, the hypertensive case is also increase. As we see the educational status those were illiterate and can read & write 39.1% were males and 29.03% were females. Most of the female cases were at the high school level (32.26%).The proportion of females were 25.81% at graduate level.

The total non adherence rate was 26% and when we see the age group against the total non adherence distribution, 19.23% of the respondents were in age group 45-49 and the same value in 50-54. The least non adherence was in age group 40-44(3.85%) which is demonstrated in Table 2. above more clearly. The data showed that there was no significance association of age to non adherence (P=0.393) which is greater than 0.05, and there is no sex to non adherence association. No cases were found below age 30years.

Daily missed dose category stands for the adherence and non adherence proportion of the hypertensive cases Table 3 above, the lowest proportion was non adherence considering the cut off value of ≥80% as adherence even if 100% of the dispensed medication were not taken

appropriately. The non adherence according to sex of the respondents 57.7% were male and 42.3% were females.

**Table 3: Anti hypertensive medication non adherence according to age group distribution at Dessie referral hospital, chronic illness management center, January 2012, Ethiopia.**

| Age group    | Level of adherence |                  | Total      |
|--------------|--------------------|------------------|------------|
|              | Adherent (n)       | Non adherent (n) |            |
| 30-34        | 3                  | 3                | 6          |
| 35-39        | 1                  | 2                | 3          |
| 40-44        | 2                  | 1                | 3          |
| 45-49        | 15                 | 5                | 20         |
| 50-54        | 10                 | 5                | 15         |
| 55-59        | 16                 | 4                | 20         |
| 60-64        | 7                  | 3                | 10         |
| ≥65          | 20                 | 3                | 23         |
| <b>Total</b> | <b>74</b>          | <b>26</b>        | <b>100</b> |

These were the existing factors expected to be influential the adherence to anti hypertensive medication, Table 4 above, some patients respond to more than one factor so that the value seems to be more than the total non adherence value. Some of the factors had an association with non adherence. From the total non adherence of respondents 30.8% (P=0.023) comprises of poor patient-physician relationship that patients didn't get enough information from the health care provider and not satisfied with the health facility. The other factor associated to non adherence was therapy factor 30.8% (P=0.009) from the total non adherence, in this case patients were supposed to unwanted effect of the drug and they were notable to take the medication. Other factors had no significant association with non adherence.

**Table 4: Reason for antihypertensive medication non adherence with respect to the existing factors at Dessie referral hospital, chronic illness center, January 2012, Ethiopia**

| Factors  | Contribution of each factor for non adherence N (%) |
|--|---|
| Patients refuse to take the drug regularly as prescribed (Patient factors)         | 16(61.5%)   |
| Interruption due to Financial constraints (Socio economic factor)                  | 12(46.2%)   |
| Poor patient-physician relationship (Health care provider & health system factors) | 8(30.8%)  |
| Drug related , unwanted effect (Therapy factors)                                   | 8(30.8%)  |
| Pain due to B/P not felt and stop medication (Condition factors)                   | 16(61.5%)   |

The significance values and the percentage showed that there were associations between factors describes and impact on adherence negatively.

**DISCUSSION**

According to the operational definition of the study, the overall level of non adherence was found to be 26%. (The mean missed daily dose was 6.58±3.2)This underlines the seriousness of non adherence as a problem in the provision of proper health care. The definition refers mainly to the adherence of patients to the physician's instruction on agreement rather than the outcome of therapy.

**Table 5: Factors shown negative impact on adherence and their association at Dessie referral hospital, North East Ethiopia, 2012.**

| Variables                          | Percentage | Adjusted ratio at 95% CI | P-value | Impact on Adherence |
|------------------------------------|------------|--------------------------|---------|---------------------|
| Poor patient physician Interaction | 30.8%      | 2 (1.045-4.20)           | 0.023   | Negative impact     |
| Unwanted effect of the medication  | 30.8%      | 4 (3.567-6.223)          | 0.009   | Negative impact     |

The variations that exist among the literature values and this study may partly be explained by the differences in the methods employed and definitions of adherence because some of the studies used the word 'compliance'

instead of adherence but the two words are quite different in meaning and strength. The non-adherence degree of 26% (the present study) is however within the range of the literature values 74.2% (24.8% base line for

adherence according to WHO 2003 disease report, study done in Seychelles.<sup>13</sup> And as the study conducted by Aga Khan University, Pakistan, higher adherence rate was seen 77%.<sup>11</sup> This is because patients were clearly instructed by the physician and pharmacist as the teaching hospital is there and closed follow up had been taken place even with telephone call to alarm taking their medication. But all these activities were not accessible in this study area. In this study among non adherent patients those did not get brief explanation from the prescriber were 30.8%±from the total non adherence (26%) (P=.023), so that there was significant association of non adherent with the physician instruction in agreement with the patient.

Studies done in Colombia, USA (2009) showed that the levels of medication adherence among the elderly ranging from 26% to 59%. Adherence to a medication regimen requires a set of behaviors that include obtaining the medication; timely administration of the correct drug, dose, and route; and persisting with taking the medication as long as the medication is needed. Success at these behaviors can be hampered by many of the changes often seen with age.<sup>12</sup> The same is true in this study that more of the non adherence was elderly, ≥65 years age group except that the adherence rate was slightly higher. This might be due to the method employed & the representative sample taken might be different. In addition to self administered questionnaire, pills were counted to get better true value (more amenable) this two instrument utilization could strengthen consistency of the finding.

Patients 'attitude towards the disease has an effect for medication adherence from this study; most of patients 61.5% had been refused taking their medication with this long term disease.

Non-adherence behavior is dependent upon several interacting variables that are related to patient (patient factor) 61.5%, financial problem (socio economic factor) 46.2%. The poor patient physician interaction (physicians and pharmacists explanation) 30.8% the drugs prescribed (therapy factor) 30.8%, The patient's illness (condition factors) 61.5%, and the investigated factors of non-adherence in this study are of one or more of the above-mentioned origins.

The level of satisfaction of the patients to the health system was at (8.7%), 44.6%, 30.4%, 16.3% excellent, very good, good satisfactory level of satisfaction respectively but it didn't mean that there was good relation to the health care provider to the patient related to medication adherence benefit.

On the other way patients suffering from unwanted effect of the medication (side effect) supposed to stop taking the drugs were 30.8% (P=.009) still there was statistical significant (association) with non adherence to antihypertensive medication this problem was able to be

overcome through good counseling procedure& advising the patient how to minimize these effects.

A study conducted in Nigeria (2010), the non compliance was 42% the identified reason why don't comply with drug treatment, almost two third of the study population feel the side effect of drug to be intolerable or forget to take medication onetime.<sup>14</sup> But in this study 26% non adherent or non compliance was found; this difference might partly be due to the difference of the study population 100 patients at this study area and 756 patients in Nigeria this sample difference might affect the result. Industrializations also affects medication adherence in some extent that people are busy in industry and forgetfulness increases; that is Nigeria is more industrialized than Ethiopia by now.

Another study conducted North West Ethiopia, Gondar teaching hospital<sup>4</sup>; the non compliance was 16.7% which was relatively low because as had been mentioned above in Aga Khan university teaching hospital, the area where teaching hospital is there population might have better understanding about their medication and the hospital also influence on teaching of the nearby population.

## CONCLUSION

From this study it was possible to see that high percentage of hypertensive cases were non adherent to their medication (26%). As the age of the patients increase, the case to be hypertensive and being non adherence was also increases. Patients' attitude towards the disease and the medications they take was not appreciable; they were refused taking their medication thinking that long term medication is intolerable. When the pain was not felt to them they stop taking. The most influential factor to non adherence is that the patient didn't have enough information about the disease and benefit to comply with the medication. Greater impact of poor interaction of the physician to the patient and unwanted effect of the drug had an association. The other factors were insignificantly influence on anti hypertensive medication adherence

## Recommendation

The discontinuation of the treatment regimen due to side effects of drugs, negative patient attitude towards the treatment regimen etc., could at least be minimized by adequate patient-physician interaction. The importance of an adequate patient-physician interaction as one of the strategies in improving compliance has been pointed out in many literature.<sup>13</sup> The quality, duration and frequency of interaction between the patient and the physician may be variable. A detailed explanation about the nature of the disease and the drugs prescribed would increase the participation of the patients in the treatment program. So that influential awareness on health care providers, prescribers & pharmacists will be valuable. Creating

good interacting media with the patient at the time of assessment and prescription writing by the health care provider is the focal point of consideration in addition to the pharmacist at the drug counseling corner.

Offering health education (information) for the hypertensive patients (mass health education) at the time of follow up day can increase patient's awareness and attitude to comply with their medication. Pharmacists should have a role in drug therapy to avoid drug related non adherence problem as implicated.<sup>13</sup> By doing so, mortality and further complication must be prevented.

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