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# A community based study on medication adherence and its determinants among people with Non communicable diseases in Ahmedabad

**Lakshmi N[1], Priyank Algotar[2*], A Bhagyalaxmi[3]**
[1] Post Graduate Student, Department of Community Medicine, B.J. Medical College, Gujarat, India
[2] Senior Resident, Department of Community Medicine, B.J. Medical College, Gujarat, India
[3]Associate Professor, Department of Community Medicine, B.J. Medical College, Gujarat, India

**Abstract**
**Background:** Non Communicable diseases (NCD) are of exponential rise in this era. One of the main challenges in the treatment of NCD is medication adherence.
**Objective:** To study the medication adherence among people with Cardio Vascular Disease, Diabetes and Hypertension. To identify the factors that influences medication adherence.
**Methods:** Study was conducted in the field practice area of B. J. Medical College involving patients with Cardio Vascular Disease, Diabetes Mellitus, and Hypertension. They were selected by purposive sampling method and were interviewed using pretested semi structured questionnaires. Four items Morisky's Medication Adherence Scale (MMAS-4) was used for assessing medication adherence. Data analyzed using MS Excel 2013, Epi info 7.0
**Results:** Total 182 NCD patients were studied of which 78.5%, 17.5%, 53.3% of people have Hypertension, Cardio Vascular Disease & Diabetes Respectively, with the mean age of 55.8±10.6 years. 56% patients were taking treatment from private clinics. As per MMAS 4 questionnaires those with completely Adherent to medications for Diabetes (37.1%) Hypertension (41.2%), CVD (25%). Reasons were divided into two categories intentional and unintentional. 65% were from intentional non-adherent and the major reason was fear of side effects (25.8%). 35% were unintentional and the major reason was forgetfulness (23.6%).
**Conclusions:** Patients adhere poorly to NCD medications. There is a need for detecting level of adherence to medication, its barriers and subsequent interventions to reduce morbidity and mortality due to NCDs.

**Keywords:** medication non adherence, mmas-4, non-communicable disease

## 1. Introduction
India is experiencing a rapid demographic and epidemiological transition. Non Communicable Diseases (NCDs), no longer disease of rich. Developing countries like India are facing the high burden of NCDs and it is worrisome. According to a WHO report (2000), -the largest cause of death and disability in India by 2020 will be cardiovascular diseases (CVDs). Overall, 42% of all deaths in India occurs because of NCDs. NCDs cause significant morbidity and mortality both in urban and rural population, with considerable loss in potentially productive years (aged 35–64 years) of life [1].
Escalation of non-communicable diseases among low-income populations in low- and middle-income countries presents challenges for health systems. Yet, very little is known about low-income people's medication adherence. One of the greatest challenges in such contexts is providing care for those who face poverty, poor healthcare access, and concurrent physical and mental conditions. Adult patients with NCDs often struggle with adhering to their medications. Adequate management of NCDs with medications is important as they are among the most frequent causes of morbidity and mortality in older adults [2]. Medication adherence—defined as the extent to which patients take medication as prescribed by their healthcare professionals—is an important aspect of treatment efficacy, healthcare costs and patient safety [3]. According to a WHO report, inadequate medication adherence averaged 50% among patients with a chronic disease. [4] Many older adults suffer from multiple chronic diseases and are treated with numerous medications. They are, therefore, at a high risk of poor adherence, e.g. missing doses, discontinuation, alteration of schedules and doses or overuse [5].

## 2. `Materials and methods
A Cross sectional study was carried out from May to October 2017 in the Kalapi Nagar field practice area of B.J. Medical College, Ahmedabad district of Gujarat state. It has 509 households with a population of 2354 with 53% of Males and 47% of Females.80% of population were above 15 years and 7.7% of population were above 60 years. All the adults were listed, and those suffering from Diabetes, Hypertension and Cardio Vascular Diseases were noted down and included in the study. Sample size was calculated by using the formula of $4pq/ L^2$. Where p is taken as 50% with 6% absolute precision the sample size comes around 166. 10% of calculated sample size was included in the study with anticipated drop outs of 10% the final calculated sample size comes to 182. A structured interview schedule comprising of patient's general information, socioeconomic status, health systems, No. of NCDs, 4item Morisky Medication Adherence Scale (MMAS-4) was used to measure adherence, and to identify factors affecting drug adherence which were divided into intentional and un-

intentional causes [6].

## 3. Results

**Table 1:** Socio-demographic variables of the study population (n= 182)

| Variables | Frequency (n=182) | Percentage (%) |
|---|---|---|
| Age(in years) | | Mean age= **56 ±10.3** years |
| 30-45 | 26 | 14.2 |
| 46-60 | 103 | 56.6 |
| >60 | 53 | 29.1 |
| Sex | | |
| Male | 95 | 52.2 |
| Female | 87 | 47.8 |
| SEC | | |
| Class I | 2 | 1.1 |
| Class II | 40 | 21.9 |
| Class III | 56 | 30.7 |
| Class IV | 61 | 33.5 |
| Class V | 23 | 12.6 |

**Table 2:** Details regarding Non Communicable Diseases (n= 182).

| Variables | Frequency (n=182) | Percentage % |
|---|---|---|
| Duration of illness | | |
| < 5 years | 59 | 32.4 |
| ≥ 5 years | 123 | 67.6 |
| Type of illness | | |
| Hypertension | 143 | 78.5 |
| CVD | 32 | 17.5 |
| Type 2 Diabetes | 97 | 53.3 |
| No. of illness | | |
| 1 | 115 | 63.2 |
| 2 | 46 | 25.3 |
| 3 | 21 | 11.5 |
| Treatment Taken | | |
| Govt. | 79 | 43.4 |
| Private | 103 | 56.5 |

**Table 3:** Relationship between different variables & drug adherence

| Variables | Adherent | Non adherent | P value |
|---|---|---|---|
| Age | | | |
| 30-45 | 11 | 15 | |
| 46-60 | 51 | 52 | 0.06 |
| >60 | 16 | 37 | |
| Sex | | | |
| Male | 45 | 50 | |
| Female | 33 | 54 | 0.19 |
| Education | | | |
| Illiterate | 22 | 23 | |
| Primary | 9 | 33 | |
| Secondary | 18 | 30 | 0.0005* |
| High school | 14 | 14 | |
| Graduate | 15 | 4 | |
| Duration of disease | | | |
| <5 years | 22 | 36 | 0.38 |
| ≥5 years | 55 | 68 | |
| Health care facility | | | |
| Govt. | 35 | 44 | 0.73 |
| Private | 43 | 60 | |

**Table 4:** Details regarding Medication Non Adherence according to MMAS -4

| MMAS 4 | No. of patients who said "No" | | |
|---|---|---|---|
| | HT(n=143) | DM (n=97) | CVD(n=32) |
| 1. Do you ever forget to take your medication? | 92(64.3%) | 76(78.3%) | 24(75%) |
| 2. Are you careless at time about taking your medication? | 71(49.6%) | 36(37.1%) | 27(84.3%) |
| 3. When you feel better, do you sometimes stop taking your medication? | 60(41.9%) | 56(57.7%) | 19(59.3%) |
| 4. Sometimes, if you feel worse when take your medicine do you stop taking it? | 68(47.5%) | 57(58.7%) | 21(65.6%) |
| Number of patients who said "No" to all four questionnaires were considered adherent to medications. | 59(41.2%) | 36(37.1%) | 15(46.8%) |

**Table 5:** Barriers to Medication Adherence among NCD patients. (n=182)

| Reasons | Frequency | Percentage | Total |
|---|---|---|---|
| Intentional | | | |
| Fear of taking drug | 19 | 10.4 | 119(65.4%) |
| Inconvenience in taking it outside home | 24 | 13.2 | |
| Fear of taking too many drugs | 7 | 3.9 | |
| Busy work schedule | 14 | 7.7 | |
| Unpleasant taste | 8 | 4.3 | |
| Problematic side effects | 47 | 25.8 | |
| Unintentional | | | |
| Forgetfulness | 43 | 23.6 | 63(34.6%) |
| Cost | 5 | 2.7 | |
| Unavailability of nearby pharmacy | 11 | 6.1 | |
| Unavailability of prescribed drugs | 4 | 2.2 | |
| Total | 182 | 100 | |

## 4. Discussion

The present cross-sectional study was conducted among diabetic, hypertensive and CV stroke patients to find the barriers for medication adherence among them. Significant factors associated with low adherence for medication are illiterate, forgetfulness, fear of side effects, perceived lack of knowledge about effect of missing doses, and initial years of having NCDs [7, 8, 9].

The present study is a community-based study conducted among sample of 182 patients. It highlights the prevalence of low adherence to medications in an urban slum area and possible reasons for it. Low adherence for medications in diabetics, hypertensive and among CV stroke patients were found 58.8%, 62.9% and 53.2% respectively. Reasons were divided into two categories intentional and unintentional. 65% were from intentional non-adherent and the major reason was fear of side effects (25.8%). 35% were unintentional and the major reason was forgetfulness (23.6%).

In the present study, the prevalence of low adherence to diabetic medication was 45.4%. A hospital study from Puducherry reported that 26% of their study population had a low adherence score [10]. A hospital study from Mangalore shows that low adherence was found in 28% of the study participants [11]. A study from a diabetic clinic of Ethiopia shows that the proportion of patients with a low adherence score is 25.4% [12]. In the present study, the prevalence of Low adherence for diabetic treatment was higher than the other studies because our study is a community-based study, which was done in urban slum area.

In the present study, cost or socioeconomic status was not identified as a significant risk factor since most of the patients avail treatment from govt. health facility, but cost is an important problem for patient's adherence in the private setup. Their problem lies with the fact of having lack of knowledge about disease or complications and dissatisfaction with services. Hence, there is a need to properly educate the patients about disease, its complication, need for adherence of treatment, side effects of treatment, and addressing their myths. Another important factor identified is distance from the hospital and lack of transport; since most of patients are elderly and not having adequate family support, there is a need to provide drugs either in monthly mobile camps to improve the treatment adherence [13, 14].

## 5. Conclusion

Epidemiological transition of India shows that prevalence of NCDs is increasing and they are dependent on the primary health system to address their health concerns. Hence, there is a need to strengthen the existing non communicable diseases setup of the primary health-care system in not only providing drugs but also in providing quality health education and quality care to promote drug adherence leading to better health outcomes among patients.

## 6. Recommendations

Tracking of patients through mobile based application and giving regular reminders on personal numbers to decrease low adherence.

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