Assessment of Adherence to Treatment among Hypertensive and Diabetic Patients attending Urban Health Centre, Chennai

P. R. Thirumalaikumar[1], MA Vaishnavi Devi[1], S Ilangovan[2], V Abinaya[2]

[1]Associate Professor, [2]Assistant Professor, Department of Community Medicine, Government Medical College, Virudhunagar, Tamil Nadu, India

Correspondence: P. R. Thirumalaikumar, E mail : dr.thirumalaikumar@gmail.com

Abstract:

　　Introduction: Globally, Non communicable diseases (NCD) are the leading cause of death accounting for 63% of annual deaths. More than 40% of NCD deaths are premature deaths which is mainly due to the complication arising as a result of non- adherence to treatment. Moreover, non-adherence to treatment is a growing challenge in India which blocks the clinical outcomes and paves way for complications. **Objective:** To assess the treatment adherence among Diabetic and Hypertensive patients and to determine the factors influencing adherence. **Method:** Community based, cross sectional study was conducted among 112 patients of diabetes and hypertension diagnosed for more than 1 year, attending NCD clinic of Puliyanthope UHC during Oct-Nov 2020. Data was collected using semi structured questionnaire with socio demographic and, treatment details by interviewer. Adherence was assessed using Morisky Adherence Scale (MAS 4). **Results:** Among patients, 57% were female and mean age was 54 years with Standard Deviation of 4.5 years. About 39% had diabetes, 27% had hypertension and 34% suffered with both. Total of 34% patients were highly adherent and 66% were non adherent to prescribed drugs. About 64% patients monitored their blood sugar once in three months. Female patients had better adherence (51%) to medications than male(38%) but not statistically significant. About 34% of patients at least once missed their drugs due to high cost. Adherence was high among those who were aware about complications of drug discontinuation (p = 0.023). Literacy, Socioeconomic status, Number of medicines were not significant with treatment adherence (P>0.05). **Conclusion:** This study indicates high proportion (66%) of non-adherence to treatment among patients with hypertension and/or diabetes. Awareness of impact of discontinuation of drugs had a major impact on adherence to treatment. Common reasons behind low adherence were fear of side effects of drugs, forgetfulness and carelessness.

Keywords: Diabetes, Hypertension, Treatment Adherence

Introduction:

　　Non-communicable diseases (NCDs) kill 41 million people each year, equivalent to 74% of all deaths globally. Each year, more than 15 million people die from a NCD between the ages of 30 and 69 years; 85% of these "premature" deaths occur in low- and middle-income countries.[1] In 2015, as part of Sustainable Development Goal 3, the United Nations (UN) member states set the target of reducing premature mortality from non-communicable diseases (NCDs) by one-third by 2030. Given India's huge population, its achievements are critical to reaching these global targets.[2] India is in the midst of a rapid epidemiological transition: the estimated

proportion of disability-adjusted life-years (DALYs) attributable to NCDs in India has risen from 31% of total DALYs in 1990 to 55% in 2016.[3] Hypertension and Diabetes are major risk factors for cardiovascular and cerebrovascular diseases.

The global epidemic of hypertension and Diabetes is largely uncontrolled. Suboptimal adherence, which includes failure to initiate pharmacotherapy, to take medications as often as prescribed, and to persist on therapy long-term, is a well-recognized factor contributing to the poor control in hypertension and Diabetes.[4] Several categories of factors including demographic, socioeconomic, concomitant medical-behavioural conditions, therapy-related, healthcare team and system-related factors, and patient factors are associated with non-adherence. Adherence is a complex process and patients' decisions about how to manage their medications are likely based on economic, physical, psychological, and social considerations.[5]

Non-adherence to prescribed drugs schedule continues to be a major problem the world and remains a public health challenge. Non-adherence to treatment leads to poor control and increases the risk of disease complications. The prevalence and factors associated with non-adherence in resource limited settings should be determined so as to lower the impact of a disease on the health systems which are already overburdened with communicable diseases. Hence, it is needed to undertake the current study to assess the treatment adherence of Diabetes and Hypertension and to determine the factors influencing adherence.

Methods:

Study design, setting, participants:

Pulianthope Urban health centre is located in the field practice area of Madras Medical College. A Cross sectional study was conducted among 112 patients of diabetes and hypertension diagnosed for more than 1 year attending NCD clinic of Puliyanthope UHC during Oct-Nov 2020.

Inclusion Criteria: Patients who were diagnosed with diabetes and/or hypertension for more than one year residing in Pulianthope and registered in the NCD clinic.

Sample size and sampling: With absolute precision as 8 and z value of 1.96, the sample size was calculated as 102. By adding 10 % non-response rate, total sample size calculated to be 112. Sampling frame was obtained from Non-Communicable Disease register of PUliyanthope health centre. From the sampling frame, a random numbers were selected from the random number table.

Data Collection, Study Tools, and Parameters Used:

Data collected using validated semi structured questionnaire which includes the socio-demographic details, questions to assess adherence of treatment to hypertension and diabetes.

Proforma consisted details regarding socio demographic profile, personal habits like smoking, alcohol, and physical exercise, awareness on complications of disease and awareness on impact of discontinuation of drugs were asked in the questionnaire. Adherence was assessed using Morisky Adherence Scale (MAS 4), the scoring was done as below.[6]

Total score of 0- high adherence

Total score of 1-2 – medium adherence

Total score of 3-4 – low adherence

Data Analysis:

Data collected was entered in Microsoft excel 2007 spreadsheet, compiled and analyzed using SPSS 16.0.[7] Appropriate descriptive and inferential statistics was used to analyze the data.

Ethical Approval:

Permission obtained from the Institutional Ethical Committee of Madras Medical College. Written Informed consent was obtained from study participants before conducting the study.

Results:

Table 1: Socio-Demographic Details of Participants (N=112)

Variables		n (%)
Age Groups (Years)	<40	18 (16%)
	41-50	25 (22%)
	51-60	24 (21%)
	>60	45 (41%)
Gender	Male	64 (57.2%)
	Female	48 (42.8%)
Education	Up to middle school	30 (27%)
	Up to higher secondary	44 (39%)
	Graduate & above	38 (34%)
Type of family	Nuclear	74 (66%)
	Joint	38 (34%)
Socioeconomic Status	Upper	10 (9%)
	Upper middle	24 (21%)
	Middle	30 (54%)
	Lower middle	18 (16%)
Disease	Hypertension	30 (27%)
	Diabetes	44 (39%)
	Both	38 (34%)
Health centers from where treatment is availed	Government	68 (60%)
	Private	44 (40%)
Occupation	Government service	30 (27%)
	Private Service	40 (36%)
	Self employed	38 (34%)
	Unemployed	4 (7%)
Marital status	Married	100 (89%)
	Unmarried	8 (7.6%)
	Separated	2 (1.7%)
	Widowed	2 (1.7%)
H/O cardiova-scular disease	Yes	26 (23.2%)
	No	86 (76.7%)
H/O cerebrova-scular Disease	Yes	4 (3.6%)
	No	108 (96.4)
No of prescribed medicines	<5	88 (78.6%)
	>5	24 (21.4%)

Majority of the participants (57%) were males. More than 73% of the participants have studied higher secondary or graduate. Around 66 % of them were living in nuclear family. Government health facilities were availed by 60 % of participants. History of cardiovascular disease and cerebrovascular disease present in 23% and 3.5% respectively. Around 79% of participants were taking less than 5 medicines on their schedule. Total 27 % of participants were suffering from Hypertension and 39 % from Diabetes whereas 34% affected with both hypertension and Diabetes. (Table 1)

**Figure 1: Adherence of Drugs Consumption as per Morisky Scale (N=112)**
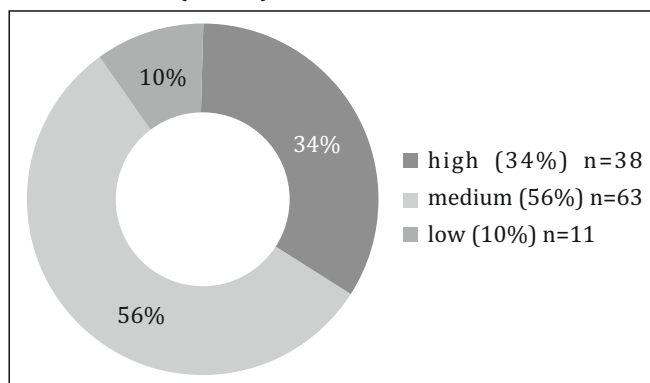
High treatment adherence was found on 38 (34%) of participants, whereas 63 (56%) were having medium adherence to treatment prescribed to them. (Figure 1)

Table 2: Proportion of Patients Adopting Healthy Lifestyle (N= 112)

Life Style Changes	n (%)
Monitoring RBS (once in 3 months)	72 (64%)
Regular exercises	60 (53%)
Following Dietary advice	43 (38%)
Regular monitoring of Blood Pressure	41 (36%)
Avoid Alcohol consumption	92 (82%)
Avoid Smoking	94 (84%)

Regular monitoring of blood pressure and blood sugar was performed by 36% and 64 % of the participants, respectively. Around 80% participants were avoiding alcohol and smoking. (Table 2)

Figure 2: Distribution of Reasons Behind Non Adherence to treatment among participants (N= 112)
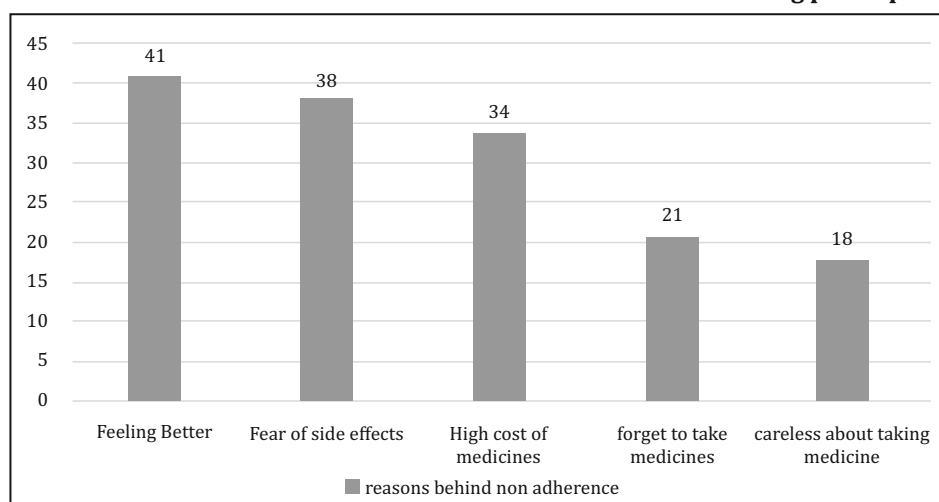
Most common reason behind non adherence to treatment was absence of any symptoms (Feeling better) among 41% participants. (Figure 2)

Table 3: Association of Treatment Adherence with Awareness about Impact of Drug Discontinuation and Disease Complication (N=112)

Awareness	High and Medium Adherence	Low Adherence	Total	p value*
Impact of drug discontinuation				
Yes	74 (73%)	2 (20%)	76 (67.8%)	
No	28 (27%)	8 (80%)	36 (32.1%)	0.002
Total	102 (100%)	10 (100%)	112 (100%)	
Complications of Diabetes and Hypertension				
Yes	66 (65%)	4 (40%)	70 (62.5%)	0.2
No	36 (35%)	6 (60%)	42 (37.5%)	

*Fisher Exact test

Patients having awareness about impact of drug discontinuation were found to have high to medium adherence to treatment, association was statistically significant. (Table 3)

Discussion:

In this study out of total 112 patients, 38 (34%) were having medium to high adherent to treatment whereas 74 (66%) were non-adherent to treatment of diabetes and hypertension. In a study done at Uganda by Joan N Kalyan et al.[8] only 25% of patients were non-adherent to treatment which is low as compared to current study (66%). In another study Conducted at Canadian province by Nandini Natarajan et al,[9] 77% of patients reported high adherence levels. Adherence to treatment was better when patients were aware on impact of discontinuation of drugs (p<0.05). This showed statistical significance. In a study done at Poland showed significant association of knowledge on hypertension with drug adherence level (p<0.05). [10]

High proportion of patients (62.5%) was aware about complications of Diabetes and hypertension. However this was not statistically significant. However, in a study done at urban slums of Navi Mumbai by Sneha Pratap Kotian et al.[11] 44% of patients were not aware of complications. High proportion of patients (65%) were adherent to treatment when they were aware of complication of diabetes and hypertension. Whereas 35% of patients who were not aware of complications were adherent to treatment(p = 0.2). This shows that by increasing the knowledge level of patients, drug adherence can be raised which in turn reduce the morbidity

In current study, proportion of patients adopting healthy lifestyles, such as regular

exercises(53%), avoiding alcohol consumption (82%) and smoking (84%) were reported. In other study done at Canadian province by Nandini Natarajan et al.[9] proportion of patients adopting regular exercises were 43.3%. As per the current study findings, there is a need to improvise regular exercises through awareness or physical activity sessions. In present study the challenges faced by patients, towards adherence to treatment were fear of side effects 43(38%), high cost of medicines 38 (34%), forgetting to take medicines 23(21%), feeling better on discontinuation of medicines 46(41%) and carelessness about taking medicines 20(18%). In a study done at Navi Mumbai by Sneha Pratap Kotian et al.[11] reasons behind non adherence among hypertensive patients were forgetfulness (99.4%) and lack of money (73.8%). Forgetting and carelessness also cited as reasons by 21% and 18 % persons, respectively which is similar (21.8%) to study conducted by Belayneh et al (2014).[12] Motivating the patients to enrol themselves in the government schemes like Makkalai Thedi Maruthuvam which provides free of cost medicines and counselling by women Health Volunteers at their doorsteps can improve the adherence levels.

Conclusion:

This study indicates high proportion (66%) of non-adherence to treatment among patients with hypertension and/or diabetes. The common reasons for non- adherence were feeling better on discontinuation of drugs, fearing of side effects, high cost of medicines and forgetfulness. Awareness on complications of stopping medicines found to be the significant factor influencing adherence of patients to treatment.

Recommendation :

Remedial measures can include doctors creating awareness among patients to promote better control of disease there by improving health outcome of the patients. Information Education and communication (IEC) materials regarding the complications of diabetes and hypertension and impact of discontinuation of drugs can be displayed at Non communicable disease Outpatient clinics.

Enrolling the patients in the government flagship programme like Makkalai Thedi Maruthuvam(MTM) which provides free of cost medicines and counselling by women Health Volunteers at their doorsteps can be applied to improve the adherence levels.

Declaration:

Funding: Nil

Conflict of Interest: Nil

References:

1. World Health Organization. Non- communicable disease fact sheet [Internet]. [cited22 May 2023] Available from: https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/ncd

2. United Nations. Sustainable development goal- 3 [Internet]. [cited 22 May 2023] Available from: https://sdgs.un.org/goals/goal3

3. Geldsetzer P, Manne-Goehler J, Theilmann M, Davies JI, Awasthi A, Vollmer S et al. Diabetes and Hypertension in India: A Nationally Representative Study of 1.3 Million Adults, JAMA Intern Med, 2018 Mar 1;178(3):363-372.

4. Krousel-Wood M, Thomas S, Muntner P, Morisky D. Medication adherence: a key factor in achieving blood pressure control and good clinical outcomes in hypertensive patients, CurrOpinCardiol, 2004;19(4):357-62

5. Burnier M, Egan BM. Adherence in Hypertension. Circ Res. 2019 Mar 29;124(7):1124-1140.

6. orisky Medication-Taking Adherence Scale-MMAS (4-item) [Internet] [cited 22 May 2023] Available from:https://inserm.hal.science/inserm-00663888/file 1472-6874-10-26-S2.PDF

7. SPSS Inc. Released 2007.SPSS for Windows, Version 16.0.Chicago,SPSS Inc.

8. Joan N Kalyango, Erisa Owini, Agatha P Nambuya. Non adherence to Diabetic treatment atMulago Hospital in Uganda: prevalence and associated factors, African Health sciences, 2008June;8(2):67-73

9. Nandini Natarajan, Wayne Putnam, Kristine Van Aarsen. Adherence to anti hypertensive medications among family practice patients with diabetes and hypertension, Fevrier, 2013

10. Beata Jankowska-Polanìska, Izabella Uchmanowicz, Krzyszt of Dudek & Grzegorz Mazur. Relationship between patients knowledge and medication adherence among patients with hypertension, Patient Preference and Adherence,2016; 2437-2447.

11. Sneha PratapKotian, Prasad Waingankar, Virendra J. Mahadik. Assessment of compliance to treatment of hypertension and diabetes among previously diagnosed patients in urban slums of Belapur, Navi Mumbai, India, Indian journal of Public health, 2019; 63: 348-52

12. Belayneh Kefale Gelaw, Abdela Mohammed, Gobezie Temesgen Tegegne. Non adherence and contributing factors among ambulatory patients with anti-diabetic medications in Adama referral hospital, Journal of Diabetes research, 2014; 1-9