Original Article

Medication Adherence among Patients with Non Communicable Diseases in a Rural Primary Health Centre in Tamil Nadu, A Cross Sectional Study

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Abstract

Background: Non communicable diseases has become the leading cause of mortality accounting to 63% in India. Poor control status of the patients is the key contributor of the rising morbidity and mortality due to non communicable diseases. Out of several factors contributing to the poor control status, medication non adherence is the most common and modifiable cause of inadequate control of NCDs.

Objectives: 1. To estimate the prevalence of medication adherence among NCD patients registered in NCD clinics of four primary health centres in rural area of Thiruvarur, Tamil Nadu, 2. To determine the factors associated with medication non adherence.

Methodology: This Analytical Cross sectional study was conducted on 235 Diabetic and/or Hypertensive patients who were enrolled by Simple random sampling method. Medication adherence was assessed using Morisky Medication Adherence Scale (MMAS – 8). The data collected was entered in Microsoft excel and analyzed using SPSS 21.0 software. Results are expressed in mean, proportions and Odds ratio appropriately.

Conclusion: This study reported that poor adherence to medications was noted in more than half (57.6%) of the study population. It shows the importance of periodic counseling sessions to the patients undergoing treatment to reinforce the importance of strict adherence to treatment.

Keywords: Medication adherence, MMAS-8, Non communicable diseases.

Introduction

Non communicable diseases are a group of diseases which affect a person for a prolonged period of time increasing the morbidity and at the same time has a negative impact on the socioeconomic development of the nation. The 2030 Agenda for Sustainable Development recognizes NCDs as a major challenge for sustainable development. So one of the targets taken is to reduce by one third; premature mortality from NCDs through prevention and treatment by 2030(SDG target 3.4)[1].

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In India, the disease pattern is changing rapidly with increasing burden of non communicable diseases due to epidemiologic transition[2].Non communicable diseases has become the leading cause of mortality accounting to 63% in India[3]. Poor control status of the patients is the key contributor of the rising morbidity and mortality due to non communicable diseases. Out of several factors contributing to the poor control status, medication non adherence is the most common and modifiable cause of inadequate control of NCDs[4].

Treatment adherence has been defined by the 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." Poor medication adherence can result in increased risk of complications resulting in increased out of pocket expenditure due to emergency visits to the outpatient department and also hospitalization due to the uncontrolled status[4]. It is better if the adherence to treatment has been reinforced to the patients at the primary health care level itself before any complications develop. Hence this study is done to assess the medication adherence among NCD patients registered in NCD clinics of primary health centres in a rural area in Tamil Nadu.

Objectives:

1. To estimate the prevalence of medication adherence among NCD patients registered in NCD clinics of four primary health centres in rural area of Thiruvarur, Tamil Nadu
2. To determine the factors associated with medication non adherence.

Materials and Methods

Study design and Setting:

This Analytical Cross sectional study was conducted on the patients with Diabetes and / or Hypertension registered in NCD clinics in a Primary Health Centre in Thiruvarur district. Out of 50 primary health centres in Thiruvarur Health Unit District, one PHC was chosen by Simple random sampling.

Study Population:

For an expected prevalence (p) of medication non adherence of 32.7% in NCDs from previous studies[4], the Sample size was calculated as 235. Data was collected from 235 Diabetic and/or Hypertensive patients who were enrolled by Simple random sampling method using Diabetic and / Hypertensive patients registered in NCD clinic of that PHC between the months of February and April 2023 as the sampling frame. Those who had Non communicable diseases other than Diabetes and Hypertension and those who are visitors to the PHC to get drugs but not registered in the NCD clinic were excluded from the study.

Ethics approval:

Institutional Ethics Committee (IEC) of Government Thiruvarur Medical College has approved the study (EC/NEW/INST/2023/TN/0296). Participants were explained about the purpose of the study and informed written consent was obtained from the participants.

Data collection:

After obtaining consent, pretested semi-structured questionnaire was administered and data was collected from the participants who fulfilled the inclusion criteria. Medication adherence was assessed using Morisky Medication Adherence Scale (MMAS – 8) and responses were recorded.

The questionnaire had two sections as following:

Section 1: This section deals with socio demographic factors. This includes age, sex, education, occupation, Living arrangements, Tobacco and alcohol usage. Also the information regarding the NCD diagnosis, duration since diagnosis and treatment regimen were included in this section.

Section 2: Medication adherence in the study participants was assessed using Morisky Medication Adherence Scale (MMAS – 8). MMAS-8 is validated in India and other parts of world in different languages with reliability value (α) of 0.83.

MMAS – 8 score ranges from 0 to 8 where score < 6 indicates low adherence, moderate adherence is defined as scores from 6 to less than 8 and good adherence is defined as MMAS – 8 score of 8.

Operational definitions and study variables:

Adherence to medication: Low adherence is defined as MMAS – 8 score < 6, moderate adherence is defined as scores from 6 to less than 8 and good adherence is defined as MMAS – 8 score of 8.

Duration of disease: Maximum duration since the patient is diagnosed with a non communicable

disease. For example, if the patient has diabetes since two years and hypertension since one year, the duration of disease would be two years.

Dosage regimen: Patients dosage is considered Once Daily, Twice Daily or Thrice Daily if he/she is consuming at least one drug once in a day, two times a day or three times a day respectively.

Number of drugs: Total number of different drugs which the patients consume in a day which are prescribed by the doctor.

Statistical analysis:

The data collected was entered in Microsoft excel and analyzed using SPSS 21.0 software. Magnitude of medication adherence was given as % and estimates given as 95% CI. Continuous variables were represented as Mean with Standard deviation and Categorical variables were represented as proportions. Association of medication non adherence and factors influencing it was analyzed using multiple logistic regression.

Results

Table 1: Socio demographic factors in the study population:

Variable	Frequency (n)	Percentage (%)
Age group (In years)		
31 - 40	12	4.7%
41 - 50	66	28.1%
51 – 60	76	32.3%
> 60 years	81	34.5%
Gender		
Male	124	52.8%
Female	111	47.2%
Education		
No formal education	67	28.5%
Primary school	58	24.7%
Middle school	56	23.8%
High school	43	18.3%
Degree holder	11	4.7%
Occupation		
Employed	75	31.9%
Retired	26	11.1%
Unemployed	134	57%
Family arrangement		
Lives with spouse / Children	205	87.2%
Lives with relatives	20	8.5%
Lives alone	9	3.8%
Lives with parents	1	0.4%
Smoking status		
Current smoker	16	6.8%
Former smoker	50	21.3%
Non smoker	169	71.9%
Alcohol consumption		
Current alcoholic	19	8.1%
Former alcoholic	57	24.3%
Non alcoholic	159	67.7%

Table 1 shows that around one third of the study population is elderly population (> 60 years). Around 28.5% of the study population had no formal education where as 4.7% of the study population is degree holders. Majority of the study population lives with spouse / children (87.2%). Around two third of the study population are non smoker (71.9%) and non alcoholic (67.7%).

Table 2: NCD status and treatment of the study subjects

Variable	Frequency (n)	Percentage (%)
NCD Diagnosed		
Hypertension only	84	35.7%
Diabetes only	53	22.6%
Both Diabetes and Hypertension	98	41.7%
Duration of NCD		
< 1 year	39	16.6%
1 – 3 years	74	31.5%
3 – 5 years	57	24.3%
> 5 years	65	27.7%
Number of drugs		
1 - 2	104	44.3%
3 - 4	99	42.1%
5 or > 5	32	13.6%
Treatment regimen		
OD	19	8.1%
BD	191	81.3%
TDS	25	10.6%
Adherence to treatment		
Good adherence	46	19.6%
Moderate adherence	53	22.6%
Low adherence	136	57.9%

Table 2 shows NCD status of the study subject and the treatment patterns. Around 41.7% of the study population has both Diabetes and Hypertension. Around one fourth (27.7%) of the study population had NCD for more than 5 years. Around 44.3% of the study population consumes 1 – 2 drugs. Around one fifth of the study population (19.6%) has good adherence to treatment.

Table 3: Association between various independent variables and decreased adherence in the study population based on bivariate analysis

S no	Study variable	Crude OR (95% CI)	p value
1	Age group (n)		
	< 60 years	Reference	0.003
	> 60 years	1.90 (1.25 – 2.90)	
2	Gender		
	Male	Reference	0.02
	Female	1.53 (1.06 – 2.19)	

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3	Education status No formal education and Primary education Above primary education	 Reference 0.59 (0.40 – 0.88)	**0.01**
4	Occupation Currently employed Currently unemployed (Including retired)	 Reference 1.46 (1.06 – 2.00)	**0.01**
5	Family arrangement Living with other people Lives alone	 Reference 3.50 (0.72 – 16.84)	0.11
6	Comorbidity Single co morbidity Multiple co morbidity	 Reference 1.39 (0.93 – 2.07)	0.10
7	Duration of treatment for NCDs < 5 years > 5 years	 Reference 2.59 (1.58 – 4.23)	< 0.001
8	Number of drugs consumed/ day < 5 5 or > 5	 Reference 2.55 (1.18 – 5.52)	0.01
9	Treatment regimen Once daily More than once daily	 Reference 1.62 (1.22 – 2.14)	0.001

Table 4: Association between various independent variables and decreased adherence in the study population based on multivariate analysis

S no	Study variable	Crude OR (95% CI)	p value
1	Age group (n) < 60 years > 60 years	 Reference 0.83 (0.43 – 1.60)	0.59
2	Gender Male Female	 Reference 1.38 (0.73 – 2.62)	0.31

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3	Education status No formal education and Primary education Above primary education	 Reference 0.16 (0.09 – 0.30)	**< 0.001**
4	Occupation Currently employed Currently unemployed (Including retired)	 Reference 0.90 (0.49 – 1.64)	0.73
5	Duration of treatment for NCDs < 5 years > 5 years	 Reference 2.08 (1.07 – 4.04)	**0.03**
6	Number of drugs consumed/ day < 5 5 or > 5	 Reference 1.72 (0.66 – 4.48)	0.26
7	Treatment regimen Once daily More than once daily	 Reference 2.77 (1.40 – 5.46)	0.003

Table 3 shows that increasing age, Female gender, Education lesser than primary education, those who are currently employed, Duration of NCDs more than 5 years, those who consume more than 5 drugs, those who takes drugs more than once daily are at higher odds of having poor drug adherence. All the variables with significant association are subjected to multivariate analysis and the results are tabulated in Table 4.

It is shown that those who have attained education above Primary level have decreased risk of developing poor adherence. Those who have taken treatment for more than 5 years have 2.08 times increased risk of having poor adherence. Those who takes drugs for more than once daily have 2.77 times increased risk of having poor adherence.

Discussion

Our study conducted among patients of Diabetes and/or Hypertension conducted in a Primary Health Centre in Thiruvarur shows that poor adherence to treatment is noted in 57.6% of the study participants. Those with educational status below primary education, On treatment for NCD for more than 5 years and those who are taking drugs more than once a day have a significant association with low drug adherence and are found to be independent predictors.

In a similar facility based cross sectional study conducted by Yuvaraj et al using MMAS – 4, the prevalence of poor drug adherence was found to be 32.7%[4]. Elderly individuals and Female gender were significantly associated were poor drug adherence[4].

In a similar study conducted by Sridhar D et al in a similar primary care setting (using MMAS – 8) low adherence to medication was only 14.3%[5]. Those who have consumed more than two and four classes of drugs and those with only Hypertension are independently associated with lower drug adherence[5].

Another study conducted in a rural area of Tamil Nadu by M.Vijayakarthikeyan et al shown that the medication adherence was 64.2% but it was a community based study and the study was done only on diabetic individuals. The reasons for the

poor adherence were identified as increased cost of treatment, Side effects of the drugs, Multiple drugs, Reliance on alternative forms of treatment and lack of proper knowledge[6].

A mixed methods study conducted in rural West Bengal (using Medication Compliance Questionnaire) showed that 39.4% of the study participants were non adherent to the NCD medications. Predictors which were significantly associated with non adherence were Increasing age, Female gender, Lower Socio economic status, Decreasing patient empowerment and Decreased trust in the medical profession. New barriers identified were Economic crisis, Fear of contagion and Non availability of investigation facilities[7].

Jeyalakshmi et al in their study conducted among the elderly population with co existing Hypertension and Type 2 Diabetes mellitus observed that 55.6% of the elderly individuals were poorly adhering to the medications. Education and Knowledge, Number of illnesses and impairments were found to be the significant predictors[8].

A study conducted by Marina Andavar et al in a tertiary care hospital using MARS – 5 scale to assess medication adherence showed that the prevalence of poor drug adherence was 40% but interestingly after effective patient counseling, the adherence has improved and the poor adherence rate has dropped down to 13.3% suggesting the importance of empowering the patients about the importance of being compliant to the treatment[9].

A Systematic review on Interventions to promote medication adherence to Chronic diseases in India showed Education of the patient regarding drug adherence by Pharmacists and Community Health Workers along with regular follow up were the promising interventions to improve the adherence[10].

Usage of a scale which is pretested and validated improves the internal validity of the study. However this study also has got few limitations. The cross sectional nature of the study does not prove the causal association of the predictors with poor drug adherence. Also this study when replicated in a community setting might yield different results compared to a single facility.

Conclusion

This study reported that poor adherence to medications was noted in more than half (57.6%) of the study population and lower educational status, longer duration of treatment and frequent dosing regimens in a day are observed to decrease the compliance to treatment. It shows the importance of periodic counseling sessions to the patients undergoing treatment to reinforce the importance of strict adherence to treatment

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Conflict of Interest: Nil

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