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ORIGINAL ARTICLE

Drug Adherence in Patients Attending Non-Communicable Disease Clinic: A Cross-Sectional Study

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Abstract

Introduction: Non communicable diseases are leading causes of Morbidity, Mortality and disability in worldwide. Non adherence to the medication plays a vital role for the inadequate control of NCDs. **Objectives:** To assess the drug adherence among patients attending the NCD clinic and the factors associated with compliance to the medications. **Methods:** A Cross-sectional study was done among 296 NCD patient attending NCD clinic at Govt Villupuram Medical college and the field practice community areas of Govt Villupuram Medical college and Hospital. WHO'S Morisky Medication Adherence Scale (MMAS)-8 was used to assess low medication adherence. **Results:** Among the 296 patients, 57% males and 43% females. The study found that 81.3% people have poor drug adherence, 10% have medium adherence and 9% have high Adherence. There was a statistical significance found between Age, Educational status occupation and Physical activity. **Conclusion:** Nearly two third of the patients have poor drug adherence in the study. The importance of Drug adherence to be sensitised and periodically health education sessions to be organized at NCD clinic to create awareness about drug adherence for the control and prevention of complications of NCDS.

Key words: Drug adherence, NCD Patient, Morbidity, Mortality, MMAS-8 SCORE

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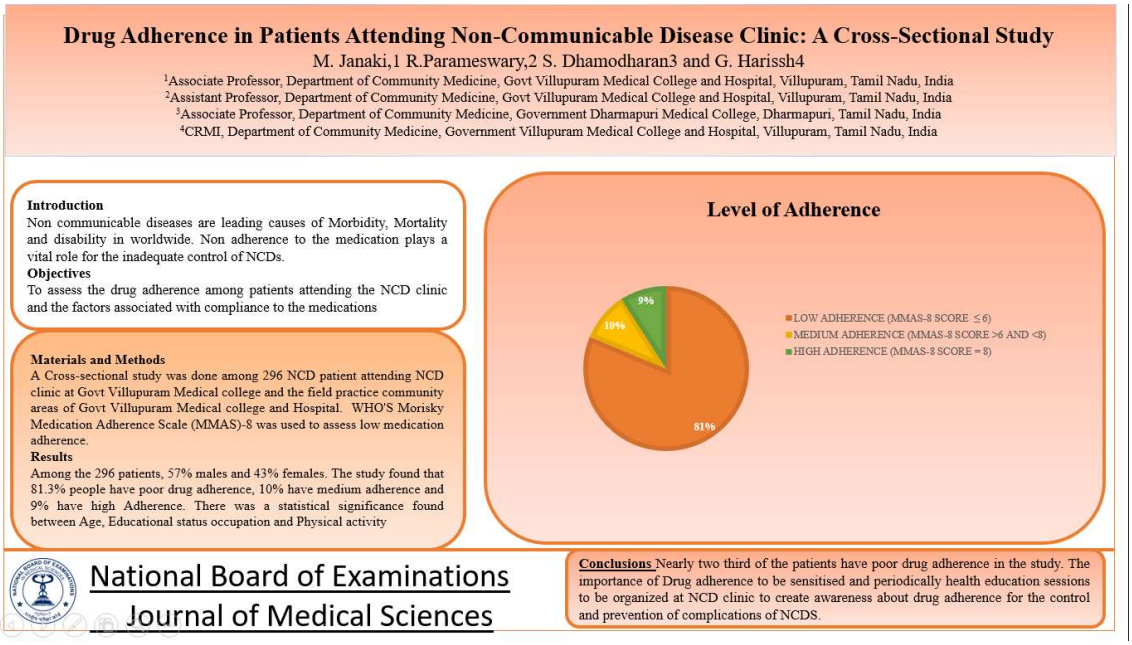
Graphical Abstract



Introduction

Globally, noncommunicable diseases (NCDs), particularly diabetes mellitus and cardiovascular disorders, have been identified as the primary cause of death [1]. Major NCDs are responsible for 47% of the world's illness burden and about 60% of all deaths in terms of morbidity, mortality, and disability [2]. Low- and middle-income nations like China and India account for the bulk of deaths [3]. In India, NCDs are responsible for 53% of all fatalities.

The main cause of the rising burden of illness and mortality from NCDs is patients' inadequate control status [4]. A number of variables, such as inadequate adherence to self-care guidelines, medication compliance, and a lack of integrated treatment at the health system level, contribute to individuals with NCDs having poor control status [5]. Of them, one of the most prevalent and possibly changeable reasons for insufficient NCD control is pharmaceutical nonadherence. Medication adherence is the "degree to which a patient acts in accordance with the prescribed interval and dose of a dosing regimen," according to the International Society for Pharmacoeconomics and Outcomes Research [6].

It has been claimed that 50% of people worldwide fully comply with their chronic illness therapy, and this percentage is even lower in underdeveloped nations like India [7]. Research conducted throughout India has revealed that the prevalence of nonadherence among NCD patients varies [8–10]. Due to outpatient care, emergency room visits, and hospitalization for the treatment of problems brought on by an uncontrolled condition, poor drug adherence raises out-of-pocket expenses. Therefore, this study will be crucial in providing a precise picture of treatment adherence in NCD patients.

This research aimed to study the drug adherence in patients attending the NCD clinic which was achieved by assessing the adherence pattern in patients

with non-communicable diseases and finding out the factors associated with the compliance to medication in patients with non-communicable disease. The majority of patients with NCD in our nation receive healthcare services from primary care and family physicians, who must ensure that patients with NCD comply to their drug regimens in order to improve their control status. Knowing the prevalence of low drug adherence to NCD will help us understand the factors that lead to it. Thereby, First corrective actions can be taken at the patient level by encouraging and teaching them about the significance of drug use, followed by family and community level actions including community awareness campaigns and clinic health education sessions. To attain a high degree of adherence among all NCD patients, all of these interventions can be coordinated at the health system level.

Methodology

This was a cross-sectional survey done among patients with NCD attending NCD outpatient department in Government Villupuram Medical College and Hospital (GVMCH) and Rural Health training centres in Villupuram district namely Kandamandi Primary Health Centre, Kedar Primary Health Centre, Thogaipadi Primary Health Centre, Urban Primary Health Centre, Keezhperubakkam Primary Health Centre, to ascertain the nonadherence prevalence. The population served by each primary health center ranges from 30,000 to 50,000. With assistance from nursing personnel and public health nurses, medical officers and undergraduate intern trainees stationed from the GVMCH Department of Community Medicine offered health services. This research was carried out in February 2023. The GVMCH Institutional Ethics Committee gave their approval to the project.

The study included every adult patient who visited the NCD clinic. The sample size was estimated to be 296 with a 5% absolute precision and a 95% confidence interval (CI) based on the prevalence of low adherence among patients with chronic conditions, which was determined to be 74% based on a previous study [8]. Nevertheless, all patients who satisfied the inclusion requirements were included in the study. Since the study included all patients who visited the NCD clinic during the study period, no sampling technique was employed.

The three medical interns assigned to the rural health centre were chosen to collect the data. They received training on how to present the questionnaire to the participants as well as sensitization on the study's goals, information confidentiality, participant rights, and informed consent. Before administering the questionnaire, the participants were informed about the study's objectives and the procedure involved. Also, individuals received assurances about the privacy of the data, and data collection only began after receiving fully informed consent. The interview was divided into three sections: sociodemographic data were covered in the first section; behavioural data, such as current tobacco and alcohol use and adequate physical activity, were covered in the second section (Figures 1 and 2).

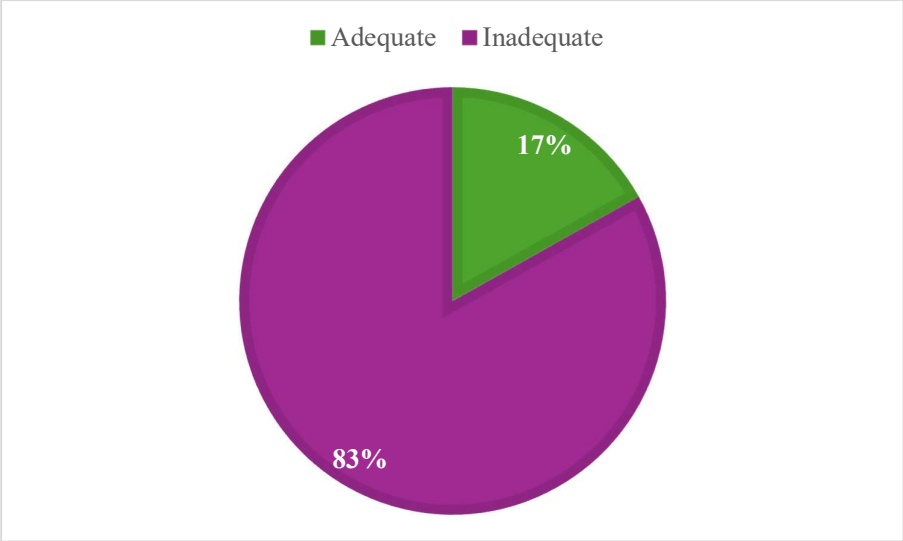


Figure 1. Physical Activity

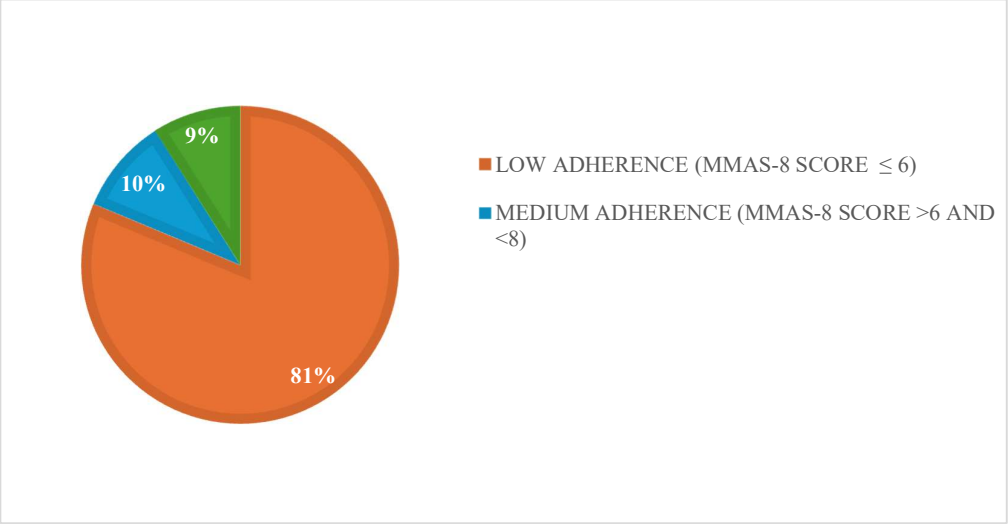


Figure 2. Level of Adherence

Those who used tobacco products regularly or infrequently during the month before the study period were considered current tobacco users; those who drank alcohol during the previous 12 months were considered current alcohol users. According to the World Health Organization's (WHO) international guidelines for physical exercise for health, it was considered sufficient to perform 150 minutes of moderate-level physical activity or 75 minutes of intense-intensity physical activity per week. The Morisky Medication Adherence Scale (MMAS)-8 was used to evaluate the study participants' poor medication adherence. An easy-to-use, eight-item scale for evaluating specific medication-taking behavior is the MMAS-8. Each question is assigned a score of either 0 or 1, depending on whether the answer is positive or negative. Cronbach's alpha reliability for the questionnaire was 0.83. [11] Pretesting, cognitive interviewing, forward translation, expert panel back translation, and final version preparation all helped to standardize MMAS for our study. The results showed that those with a score of less than six were considered to have low adherence.

Microsoft Excel 2016 was used to enter the data, while SPSS 24.0 was used for analysis. Continuous variables were summarized using mean values and standard deviation. The prevalence of low adherence was displayed as a percentage with a 95% confidence interval. Bivariate analysis (chi-square test/Fisher's exact test) was used to determine the relationship between sociodemographic traits and medication adherence. Using multivariate logistic regression analysis, factors impacting low medication adherence (independent effects) were identified. The dependent variable was medication adherence, and the explanatory variables were gender, age category, education, and occupation. The 95% CI for the adjusted prevalence ratio (PR) was calculated. Statistical significance was defined as a P value of 0.05 or less (Tables 1 to 6).

Results

Table 1. Sociodemographic Characteristics (N=296)

Sociodemographic parameters	**frequency**	
	n	**%**
Age (in years)		
20-29	3	1
30-39	44	15
40-49	77	26
50-59	79	27
60-69	62	21
70-80	31	10
Gender		
Male	170	57
Female	126	43
Educational Status		
Uneducated	233	79

Informally educated	51	17
Formally educated	12	4
Occupational Status		
Unemployed	93	31
Employed	203	69
Family Type		
Nuclear	157	53
Joint-family	40	14
Three-generation	101	34

Table 2. Behavioural Characteristics

Behavioural Characteristics	**Frequency**	
	n	**%**
Current Tobacco user (in past 1 month)		
Yes	51	17
No	245	83
Current Alcohol user (in past 1 year)		
Yes	78	26
No	218	74
Physical Activity		
Adequate	50	17
Inadequate	246	83

Table 3. MMAS-8 Score Obtained by Participants

SCORE	**FREQUENCY**	
	n	**%**
0	51	17.2
1	12	11.4
2	24	8
3	25	8.4
4	24	8
5	42	14
6	62	21
7	29	10
8	27	9

Table 4. Sociodemograghic Factors Influencing MMAS-8 Score

AGE (in years)	**n**	**LOW ADHERENCE**		**MEDIUM ADHERENCE**		**HIGH ADHERENCE**		**P VALUE**	**R VALUE**
		n	**%**	**n**	**%**	**n**	**%**		
20-29	3	3	100	0	0	0	0	0.00	0.01
30-39	44	32	73	11	25	1	2	0.00	0.01
40-49	77	62	81	6	8	9	12	0.00	0.01
50-59	79	66	84	7	9	6	8	0.00	0.01
60-69	62	52	84	5	8	5	8	0.00	0.01
70-80	31	25	81	0	0	6	19	0.00	0.01
GENDER									
MALE	170	141	83	18	11	11	6	0.23	0.70
FEMALE	126	100	79	11	9	16	13	0.23	0.70
EDUCATIONAL STATUS									
UNEDUCATED	233	184	79	23	9	26	50	0.00	0.05
INFORMALLY EDUCATED	51	44	86	6	11	1	1	0.00	0.05
FORMALLY EDUCATED	12	12	100	0	0	0	0	0.00	0.05
OCCUPATIONAL STATUS									
UNEMPLOYED	93	73	78	13	14	7	8	0.00	0.01

EMPLOYED	203	167	82	16	8	20	10	0.00	0.01
FAMILY TYPE									
NUCLEAR	157	121	77	19	12	17	11	0.00	0.49
JOINT FAMILY	40	33	83	7	18	0	0	0.00	0.49
THREE GENERATION	101	88	87	3	3	10	10	0.00	0.49

Table 5. Behaviourial Characteristic Factors Influencing MMAS-8 Score

CURRENT TOBACCO USER (IN PAST ONE MONTH)	**n**	**LOW ADHERENCE**		**MEDIUM ADHERENCE**		**HIGH ADHERENCE**		**P VALUE**	**R VALUE**
		n	**%**	**n**	**%**	**n**	**%**		
YES	51	39	76	6	11	6	11	0.9	0.33
NO	245	201	82	23	9	21	8	0.9	0.33
CURRENT ALCOHOL USER (IN PAST ONE YEAR)									
YES	78	66	85	7	8	5	6	0.00	0.525
NO	218	174	80	22	10	22	10	0.00	0.525
PHYSICAL ACTIVITY									
ADEQUATE	50	31	62	6	12	13	26	0.00	0.00
INADEQUATE	246	209	85	23	9	14	5	0.00	0.00

Table 6. Response to Each Question and Its Influence on MMAS-8 Score

QUESTIONS	n	LOW ADHERENCE		MEDIUM ADHERENCE		HIGH ADHERENCE		P VALUE	R VALUE
		n	%	n	%	n	%		
Have you ever forgotten take your medication?									
YES	171	119	70	25	15	27	16	0.00	0.00
NO	125	121	97	4	3	0	0	0.00	0.00
In the past 2 weeks, have you forgotten to take your medications?									
YES	146	90	62	29	20	27	18	0.00	0.00
NO	150	150	100	0	0	0	0	0.00	0.00
When you feel that the condition is aggravated or changed, do you adjust the dose without telling your doctor?									
YES	146	90	62	25	17	27	18	0.00	0.00
NO	150	146	97	4	3	0	0	0.00	0.00
When you travel or leave home for a long time, have you ever forgotten to bring medications?									
YES	135	83	61	25	17	27	20	0.00	0.00
NO	161	157	98	4	2	0	0	0.00	0.00
Did you take medications Yesterday?									
YES	167	160	72	20	12	27	16	0.00	0.00
NO	129	120	93	9	6	0	0	0.00	0.00
When you feel that your condition is under control, do you stop taking your medication without consulting your doctor?									
YES	145	93	64	25	17	27	19	0.00	0.00
NO	151	147	97	4	2	0	0	0.00	0.00
Do you ever find it difficult to adhere to your medication?									
YES	151	122	81	29	19	27	18	0.00	0.00
NO	145	145	100	0	0	0	0	0.00	0.00
Do you find it difficult to remember to take your daily dose of medicine on time?									
YES	167	115	69	25	15	27	16	0.00	0.00
NO	129	125	97	4	4	0	0	0.00	0.00

Discussion

In the Villupuram district, this community-based cross-sectional study was done among NCD patients who visited primary health care centres. The primary objective of this study was to identify the prevalence of low adherence and the contributing factors. 81.3% of people were found to have poor drug adherence. After possible confounding factors were taken into account, it was discovered that older and female participants had a higher likelihood of not taking their drugs as indicated.

According to this survey, over two-third (81.3%) of the patients were not taking their drugs as prescribed. Similarly, research conducted in Kerala revealed a prevalence of nonadherence of 74%.[8] Although roughly one-third of the participants in previous south Indian studies in Andhra and Karnataka reported nonadherence to medicine, they also found results that were contrast to those of this study [9,10]. Use of a validated scale to measure drug adherence was one of the study's key strengths. As the technique used to measure adherence includes questions linked to forgetfulness or carelessness and the attitude of the patients towards drug consumption, we were unable to obtain the precise number of pills skipped. The study is strengthened by its higher response rate (100%) and examination of nonadherence obstacles for several NCDs.

The study, however, had certain drawbacks. Apart from the links that were explicitly indicated by the participants, this study was conducted as a single cross-sectional interview, hence no causal relationship between nonadherence and factors related could be established. Although the majority of the responses were based on memory, bias can still exist. For patients with NCDs to experience improved control status, good medication adherence is crucial. The majority of patients in our nation with NCDs receive their medical care from family doctors and primary care doctors, who must make sure this is the case.

Conclusion

According to this study, over two thirds of the patients did not take their drugs as prescribed. Corrective actions must begin at the patient level by inspiring and educating them about the significance of drug consumption, and family level and community level actions can be carried out, such as health education workshops at the clinic and awareness campaigns in the community. To obtain high adherence levels among all NCD patients, all of these interventions must be coordinated at the level of the health system.

Statements and Declarations

Conflicts of interest

The authors declare that they do not have conflict of interest.

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