

Original research article

Study of the Factors Affecting Medication Adherence Among Patients Taking Treatment for Non-communicable Diseases in a Tertiary Care Hospital

Dr Prerna Tejaswi¹, Dr. Kumar Devashish², Dr. Syed Md Javed³,
Dr.V.K. Mishra⁴

¹Assistant Professor, Department of Pharmacology, Madhubani Medical College,
Madhubani, Bihar, India

²Tutor, Department of Pharmacology, Darbhanga Medical College, Laheriasarai,
Darbhanga, Bihar, India

³Professor, Department of Pharmacology, Madhubani Medical College, Madhubani.
Bihar, India

⁴Professor, Department of Pharmacology, Darbhanga Medical College, Laheriasarai,
Darbhanga, Bihar, India

Corresponding Author: Dr. Kumar Devashish

Abstract

Introduction: Early detection and compliance to prescribed treatment is important to avoid life threatening complications among those with non-communicable diseases (NCDs). The present study aimed to assess adherence to prescribed medications and associated factors among patients with NCDs.

Methodology: This was a cross-sectional survey done among patients with diagnosed with NCDs attending outpatient clinic of Medicine department to determine the prevalence of non adherence. To assess medication adherence, the Morisky Medication Adherence Scale (MMAS-8) was used. Patients were divided into two groups for the purposes of analysis: those with poor medication adherence (MMAS-8 score less than 6) and those with moderate to high medication adherence (MMAS-8 score more than 6). (MMAS-8 6 or above).

Comparison of patient related variables was done using chi-square test

Results: Out of 232 patients, 22% had low compliance to drug therapy. Mean age of the patients was 48.5 years, ranging from 30 to 78 years. Increasing age and female gender were found to be significantly associated with low medication compliance. Literacy, employment status, alcohol and tobacco consumption were not found to be significantly associated with low medication compliance. In addition, having only one non-communicable disease, disease duration more than 5 years and having to take five to six medications were found to be associated with low medication adherence.

Conclusions: Approximately one-fifth of patients adhered poorly with their medications. Patients must be sufficiently motivated and counselled in order to adhere to their medication regimens. Further study is required to assess the efficacy of different educational techniques for promoting patient medication adherence.

Keywords: medication non adherence; non-communicable disease; hypertension; diabetes mellitus

Introduction

Chronic non-communicable diseases (NCDs), such as diabetes, high blood pressure, cerebrovascular disease, and cancer, are associated with increased morbidity because of bad lifestyle behaviours, such as excessive alcohol use, smoking, and poor nutrition.¹ Because these illnesses need long-term care and result in a rise in medical expenses, several nations have taken steps to prevent noncommunicable diseases from occurring (NCDs).² Due to the fact that poor medication adherence by patients with NCDs has an impact on illness prognosis, it is critical to concentrate efforts on improving it. In order to enhance medication adherence, it is vital to understand the variables that cause patients to have difficulty adhering to their prescription regimens. Different studies have assessed variables that contribute to pharmaceutical non-adherence, and the association between socioeconomic characteristics such as gender, age, race, and educational background and non-adherence is well understood.³

Previous study has shown a strong link between unhealthy lifestyle choices such as smoking, consuming alcohol, and a lack of exercise, as well as noncompliance with prescription instructions.⁴ Furthermore, issues directly connected to medicine consumption, such as worries about side effects and the severity of a patient's sickness or disability, have been found as variables driving medication non-adherence in several studies. In medicine, medication adherence is defined as the degree to which patients stick to the regimen of medicines given by their healthcare providers. It is a critical factor in the effectiveness of therapy, the expense of healthcare, and the safety of patients.⁵ Patients in India are found to have poor drug adherence rates that range from 17.5 percent to 48.5 percent.⁶ As a result, the current research was carried out in order to determine medication adherence patterns and related variables among patients who were taking drugs for noncommunicable diseases.

METHODOLOGY

Study Design and Sampling

This was a cross-sectional survey done among patients with diagnosed with noncommunicable disease attending outpatient clinic of Medicine department to determine the prevalence of nonadherence. This study was conducted during July 2021 to December 2021. We included all the patients with any non-communicable disease who are registered and attending Medicine OPD at least four weeks of treatment prior to the date of interview. The minimum sample size was calculated to be 216, assuming 17% to have low adherence⁷, 5% absolute precision and 95% confidence limit. However, during the study period, we included 232 patients.

Data Collection and Data Analysis

To gather information, a semi-structured interview schedule that had been pretested was employed. Age, gender, education, employment, as well as lifestyle behaviours such as alcohol use and cigarette use, were all included in the socio-demographic information. Variables such as the kind of morbidity (disease type), the length of therapy, and the quantity of medications used were included in the treatment information. The information on the therapy received was obtained from the patients' treatment cards. To assess medication adherence, the Morisky Medication Adherence Scale (MMAS-8) was used, which has eight items and may be classified as low, moderate, or excellent.⁸ It was divided into three categories: low, moderate, and good. MMAS-8 is validated in India and other parts of world in different languages with reliability value (α) of 0.83. Low adherence is defined as MMAS scores less than 6; moderate adherence is defined as MMAS scores between 6 and less than 8; and strong adherence is defined as MMAS scores more than 8. For the purpose of content verification, the questions from MMAS-8 were translated into Hindi and then back into English. The interview schedule was overseen

by qualified staff nurses who were fluent in the local language and performed the interviews. A questionnaire was also administered to patients in order to gather information on the numerous obstacles and problems they experience in order to maintain medication compliance.

SPSS version 25 was used to generate and analyse all of the data (IBM, NY). The frequency distributions of all variables were used to characterise them. Patients were divided into two groups for the purposes of analysis: those with poor medication adherence (MMAS8 score less than 6) and those with moderate to high medication adherence (MMAS-8 score more than 6). (MMAS-8 6 or above). The chi-square test was used to evaluate all relevant patient-related factors between patients with poor and moderate to high adherence, with a p value of less than 0.05 being statistically significant between the two groups.

Ethical Considerations- The present study protocol was approved by our Institutional Ethics Committee before the commencement of the study. Additionally, prior to the collection of any information from the patients, their written voluntary informed consent was obtained. Only the data on the study variables were analyzed, and all the personal information of the patients was kept confidential.

RESULTS

It was observed that, out of 232 patients, 22% had low compliance to drug therapy, 49% had moderate compliance and 29% had good compliance (Figure 1). Mean age of the patients was 48.5 years, ranging from 30 to 78 years. It was observed that among those with low compliance, 65% were aged more than 60 years of age (Table 1). This proportion was significantly higher as compared to those with moderate to good compliance (14%). In addition, females comprised 77% of the group with low compliance, which was significantly higher as compared to those with moderate to good compliance (53%), p value < 0.05. Thus, increasing age and female gender were found to be significantly associated with low medication compliance. Literacy, employment status, alcohol and tobacco consumption were not found to be significantly associated with low medication compliance.

The type of non-communicable disease was not found to be significantly associated with medication adherence (Table 2). It was observed that 62% of those with low drug compliance had one disease, while among those with moderate to good compliance 24% had one disease (p value < 0.05). Furthermore, in the group of patients with low drug compliance 35% had disease duration for more than 5 years, which was significantly higher than those in the moderate to good drug compliance (14%), p value < 0.05. A higher number of medications were also found to be significantly associated with low compliance as well, while the medication regime was not.

On inquiring about the barriers to maintaining medication compliance, 19% reported having side effects, 13% found it difficult to take medication outside home., 11% reported having busy work schedule and 6% perceived that they are taking too many medications. Unintentional causes like forgetfulness (15%), high cost of medication (8%) and lack of a pharmacy nearby (6%) were also reported by few patients.

DISCUSSION

In the current research, 22% of patients had a poor level of medication adherence, whereas 49% had a moderate degree of medication adherence. Yuvaraj et al. observed a prevalence of poor adherence of 32.7 percent (95 percent CI: 27.2–38.6) in a comparable research.⁹ Similar outcomes were found in other south Indian studies conducted in Andhra Pradesh¹⁰ and

Karnataka¹¹, where over one-third of individuals failed to adhere to treatment regimens. Sridhar et al. observed poor, moderate, and excellent adherence to medicine in 203 (14.4%), 602 (42.8%), and 601 (42.7%) subjects, respectively.¹² A cross-sectional research done in a public primary care clinic in China revealed that 32.6 percent of hypertension patients had poor drug adherence.¹³ Lakshmi and colleagues discovered that 58.8 percent, 62.9 percent, and 53.2 percent of diabetic, hypertensive, and stroke patients, respectively, had inadequate medication adherence.¹⁴ Banerjee et al. evaluated medication adherence using the

"Medication Compliance Questionnaire (MCQ)" and the "Adherence to Healthy Lifestyle and Follow-up Advice Questionnaire."¹⁵ According to the MCQ scale, 84 (39.4 percent) of individuals were non-compliant with their prescription drugs. 143 (67.1%) of the participants did not adhere to a healthy lifestyle or follow-up counselling. In all, 23.9 percent of patients were found to be non-compliant with their treatment regimens.

We discovered that individuals above the age of 60 and feminine gender had a much lower rate of drug adherence. Yuvaraj et al. noticed a strong connection between poor adherence and patient age more than 60 years and female gender, similar to our results.⁹ Apart from these, the scientists discovered no correlation between poor adherence and patient education, employment, or family type. It should be emphasised that even literate persons had poor drug adherence in our research; hence, qualitative investigations will aid in determining the explanation for this low adherence among educated individuals. Without addressing these issues, the health promotion component of national programmes will be unable to provide desired treatment results.

Additionally, we noticed that those with a single non-communicable condition had a greater likelihood of poor medication adherence than those with several non-communicable diseases. Apart from this, it was shown that illness duration more than 5 years and the need to take five to six drugs were substantially related with inadequate medication adherence. In a similar research, Sridhar and colleagues discovered that the percentage of patients with inadequate adherence was significantly greater in those with just hypertension (16.0 percent) compared to those with only diabetes (10.8 percent) or both chronic conditions (14.2 percent).¹² Similarly, the percentage of patients with inadequate adherence was found to be significantly greater among those who took five to nine pills per day (25%) compared to those who used three to four drugs (16.4%) or one to two drugs (9.7%). Other characteristics that were adjusted and found to be non-significant were age, gender, education, employment, alcohol and cigarette usage, illness duration, and regimen. After controlling for other variables, disease type and quantity of medications taken each day were substantially linked with poor adherence. Having merely hypertension, taking more than two classes of medications, and consuming more than four classes of medications were all independently related with poor adherence.

Banerjee et al. found that rising age, female gender, poor socioeconomic position, the prevalence of multimorbidity, decreasing patient empowerment, and decreasing faith in the medical profession were all significant predictors of medication nonadherence.¹⁵ Their research discovered that patient empowerment dramatically increases not just medication adherence, but also lifestyle and follow-up counsel adherence. Numerous researches have shown the critical role of health empowerment and self-efficacy in increasing treatment adherence.¹⁶ Thus, comparable results in their research underline the relevance of patient empowerment as a feasible strategy for increasing medication adherence, particularly among NCD patients, and for establishing successful self-management in disease control.

This research has a few drawbacks. We were unable to get the precise pill count missing since the method used to assess adherence includes questions on forgetfulness or carelessness, as well as the patients' attitude toward medicine intake. Second, since the replies were based on recollection, bias is a possibility.

CONCLUSION

In this study, 22% of the patients were found to have low medication adherence. Patients with age more than 60 years, female gender, only one non-communicable disease, disease duration more than 5 years and having to take five to six medications were found to be associated with low medication adherence. Patients must be sufficiently motivated in order to stick to their medication regimens. In order to address non-communicable illnesses, health education seminars targeting family and community members may be organised, with one of the areas being the necessity of medication adherence. Furthermore, further study is required, including the implementation of an interventional trial assessing the efficacy of counselling for promoting patient medication adherence, as well as the exploration of different instructional modalities.

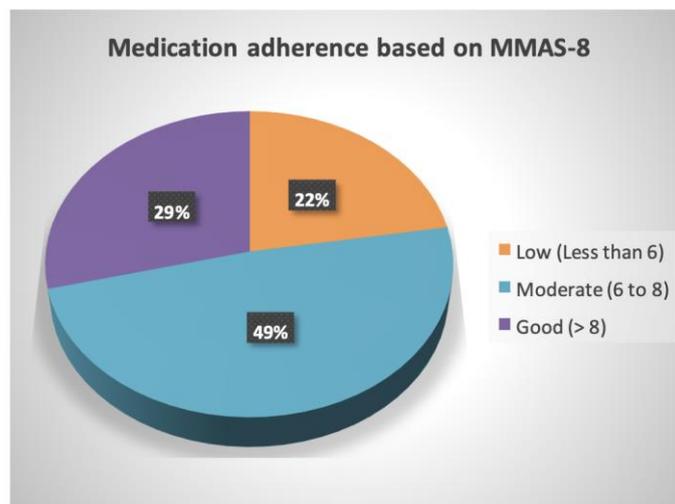


Figure 1: Frequency distribution of patients according to their adherence levels

Table 1: Sociodemographic variables associated with low medication adherence levels

Variables	Adherence to prescribed medication				p value*
	Moderate to good (n=180)		Low (n=52)		
	N	%	N	%	
Age groups (years)		48%			
30 to 45	87		6	12%	
46 to 60	67	37%	12	23%	< 0.05
More than 60	26	14%	34	65%	
Gender					
Male	84	47%	12	23%	< 0.05
Female	96	53%	40	77%	
Illiterate	46	26%	13	25%	0.44
Unemployed	26	14%	9	17%	0.38
Current alcohol consumption		17%			
Yes	31		10	19%	0.38
No	149	83%	42	81%	
Current tobacco consumption		13%			
Yes	24		6	12%	0.52
No	156	87%	46	88%	

*analyzed using chi-square

Table 2: Clinical variables associated with low medication adherence levels

Variables	Adherence to prescribed medication				p value*
	Moderate to good (n=180)		Low (n=52)		
	N	%	N	%	
Disease					
Hypertension	114	63%	31	60%	0.67
Diabetes mellitus	74	41%	22	42%	0.44
Cardiovascular disease	56	31%	14	27%	0.72
Cerebrovascular	12 disease	7%	5	10%	0.51
Number of non-communicable diseases					
One	43	24%	32	62%	< 0.05
Multiple	137	76%	20	38%	
Disease duration (years)		41%			
< 1	73		12	23%	
1 to 3	36	20%	12	23%	< 0.05
3 to 5	45	25%	10	19%	
More than 5	26	14%	18	35%	

Medication regimen					
Once a day	104	58%	36	69%	
Twice a day	43	24%	7	13%	0.52
Thrice a day	33	18%	9	17%	
Number of medications					
One to two	85	47%	11	21%	
Three to four	59	33%	17	33%	< 0.05
Five to six	36	20%	24	46%	

*analyzed using chi-square

Table 3: Barriers to maintaining medication adherence

Barriers	Frequency Percent	
Intentional		
Side effects	44	19%
Difficult to take medication outside home	31	13%
Work schedule	25	11%
Too many medication	13	6%
Unintentional		
Forgetfulness	35	15%
Cost of medication	19	8%
No nearby pharmacy	15	6%

References

1. Shrestha P, Ghimire L. A review about the effect of life style modification on diabetes and quality of life. *Global journal of health science*. 2012 Nov;4(6):185.
2. World Health Organization. Noncommunicable Diseases. Available online: <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases> (accessed on 17 January 2022).
3. Camacho N, De Jong M, Stremersch S. The effect of customer empowerment on adherence to expert advice. *International Journal of Research in Marketing*. 2014 Sep 1;31(3):293-308.
4. Han E, Sohn HS, Lee JY, Jang S. Health behaviors and medication adherence in elderly patients. *American Journal of Health Promotion*. 2017 Jul;31(4):278-86.
5. Medi RK, Mateti UV, Kanduri KR, Konda SS. Medication adherence and determinants of non-adherence among South Indian diabetes patients. *J Soc Health Diabetes*. 2015; 3:48-51.
6. Kumar N, Unnikrishnan B, Thapar R, Mithra P, Kulkarni V, Holla R et al. Factors associated with adherence to antihypertensive treatment among patients attending a tertiary care hospital in Mangalore, South India. *Int J Cur Res Rev*. 2014;6(10):77-85.
7. Thekkur P, Reddy MM, Ramaswamy G, Naik B, Lakshminarayanan S, Kumar Saya G. Medication adherence and its correlates among diabetic and hypertensive patients seeking care from primary health center, India. *Int J Curr Pharm Rev Res* 2015;7:33-9.
8. Morisky DE. Predictive validity of a medication adherence measure for hypertension control. *Journal of clinical hypertension*. 2008 Jun 16;10:348-54.
9. Yuvaraj K, Gokul S, Sivaranjini K, Manikandanesan S, Murali S, Surendran G, et al. Prevalence of medication adherence and its associated factors among patients with noncommunicable disease in rural Puducherry, South India – A facility-based cross-

- sectional study. *J Family Med Prim Care* 2019;8:701-5.
10. Yusuff KB, Obe O, Joseph BY. Adherence to anti-diabetic drug therapy and self-management practices among type-2 diabetics in Nigeria. *Pharm World Sci* 2008;30:876-83.
 11. Cramer JA. A systematic review of adherence with medications for diabetes. *Diabetes Care* 2004;27:1218-24.
 12. Sridhar D, Narayan KA. Medication adherence and associated factors among individuals with non-communicable diseases registered for care in primary health centers of Villupuram district, South India. *National Journal of Research in Community Medicine*. 2019 Jun 30;8(2):156-62.
 13. Lee GKY, Wang HHX, Liu KQL, Cheung Y, Morisky DE, Wong MCS. Determinants of medication adherence to antihypertensive medications among a Chinese Population Using Morisky Medication Adherence Scale. *PLoS ONE* 2013;8(4):e62775.
 14. Lakshmi N, Priyank A, Bhagyaxmi A. A community based study on medication adherence and its determinants among people with Non communicable diseases in Ahmedabad. *International Journal of Multidisciplinary Research and Development* 2019;6(4):1-4.
 15. Banerjee A, Paul B, Dobe M, Bandyopadhyay L, Bhattacharyya M, Sahu M. Determinants of Treatment Adherence Among Patients Living With Noncommunicable Diseases: A Mixed-Method Study in a Rural Area of West Bengal. *Journal of patient experience*. 2021 Sep;8:23743735211039330.
 16. Castro EM, Van Regenmortel T, Vanhaecht K, et al. Patient empowerment, patient participation and patient-centeredness in hospital care: a concept analysis based on a literature review. *Patient EducCouns*. 2016;99(12):1923-39.

Received: 11-01-2022.

Revised:21-01-2022.

Accepted:12-02-2022