

Evaluation of Medication Adherence Practices among Patients Attending Non-Communicable Diseases OPD – A Cross-Sectional, Questionnaire-Based Study in a Tertiary Care Hospital

Annapurna D.¹, Santhi Lakshmi CH², Suresh Babu N.³, Sirisha N. P.⁴

¹Professor & HOD, Department of Pharmacology, Government Medical College, Vizianagaram, Andhra Pradesh

²Assistant Professor, Department of Pharmacology, Government Medical College, Vizianagaram, Andhra Pradesh

³Associate Professor, Department of Pharmacology, Government Medical College, Vizianagaram, Andhra Pradesh

⁴Assistant Professor, Department of Pharmacology, Government Medical College, Vizianagaram, Andhra Pradesh

Received: 25-03-2025 / Revised: 23-04-2025 / Accepted: 26-05-2025

Corresponding Author: Dr. Annapurna D

Conflict of interest: Nil

Abstract:

Aim: This study aimed to measure medication non-adherence and to assess the perceived barriers, and facilitators.

Objectives: (1). To measure the rate of medication non-adherence. (2). To assess medication-taking behaviors, attitudes towards medication adherence, and reasons for non-adherence.

Study design: The MARS questionnaire was used in this cross-sectional study, which was conducted in the non-communicable diseases department of a tertiary care hospital in Vizianagaram. After the evaluation, patients and referring clinicians received a report that included tailored suggestions for lifestyle, psychological, and pharmaceutical therapies.

Study Sample Size: During the study period from October 2024 to December 2024, a total of 306 fully completed questionnaires from outpatients visiting our GGH's non-communicable diseases department were obtained. Descriptive statistics were used for review and analysis.

Results: Descriptive statistics were used to analyze the 306 completed questionnaires received throughout the study period. Over half (51%) of the participants were men. The patient's average age was 56.8 years. The MARS Questionnaire states that a score of greater than six denotes good medication adherence, while a score of less than six denotes poor medication adherence. Of the 306 participants, 282 received a rating higher than six. The majority of study participants (92.15%) generally adhered to their drug regimens well, although 7.84 percent showed poor medication adherence.

Conclusion: The majority of patients with chronic non-communicable disorders (92.15%) in this study had good drug adherence. Patients' medication adherence was found to be influenced by their personal opinions; those who strongly believed that medications were necessary were less likely to have poor medication adherence. Potential contributing factors for medication adherence include age, disease stage, severity of sickness, and income stability.

Keywords: Chronic Diseases, Personal Beliefs, Medication Adherence, MARS Questionnaire.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

A key factor in determining the effectiveness of treatment is adherence to therapy. Adherence issues are severe and have an impact on the patient as well as the healthcare system. Patients who do not take their medications as prescribed have significant worsening of their condition, death, and higher health care expenses. Several variables that could influence adherence. Patient, provider, and health system characteristics, as well as their interactions,

could be used to address adherence barriers. To increase medicine adherence, each patient's unique obstacles must be identified, and appropriate strategies must be used to get beyond them. Improving patient medication adherence is a major part of the daily work of healthcare professionals like doctors, pharmacists, and nurses. Medication adherence is defined by the World Health Organization as "the degree to which the person's behavior corresponds

with the agreed recommendations from a health care provider." [1] It can refer to various stages: initiation of treatment, implementation of the prescribed medication regime, and discontinuation of medical treatment. Patients with acute diseases tend to have higher adherence rates than those with chronic disorders [2,3].

Non-adherence has several negative effects, including drug waste, illness progression, decreased functional abilities, lower quality of life, and higher utilization of medical resources, including hospital visits, nursing homes, and hospital hospitalizations. [4,5]

Medication non-adherence can have detrimental effects on the patient, the doctor, the healthcare provider, and even medical researchers who are trying to determine the medication's effectiveness in the target group.

Therefore, assisting people in taking their medications as prescribed would be a better way to minimize antibiotic resistance, severe relapses, and avoidable hospitalizations. It will be easier to organize patient education to enhance adherence if the prevalence of medication non-adherence and perceived impediments to adherence are studied. This is why the current investigation has been undertaken.

Aim: This study aimed to measure medication non-adherence and to assess the perceived barriers, and facilitators.

Objectives:

1. To measure the rate of medication non-adherence.
2. To assess medication-taking behaviors, attitudes towards medication adherence, and reasons for non-adherence.

Materials and Methods

Study setting and study population: The current study was carried out in the non-communicable diseases department of the Government General Hospital in Vizianagaram, Andhra Pradesh, India, between October 2024 and December 2024. It is a cross-sectional questionnaire-based study that used the MARS questionnaire.

The institutional ethics committee gave its approval to the study's protocol. Participants who were willing to participate in the study gave their informed written consent, and patient anonymity was maintained throughout the whole research process.

Study Sample Size: A convenience sample of patients between the ages of 18 and 75 who were of both sexes was chosen at random from the non-

communicable illnesses department. During the study period, a total of 306 participants' questionnaire responses were received, examined, and evaluated.

Inclusion Criteria:

- Age between 18 to 75 years
- Diagnosis with hypertension, diabetes, IHD, CVA, Epilepsy,
- Those attending NCD OP.

Exclusion Criteria:

- Below 18 years of age patients.
- Diagnosis with infectious diseases, HIV, HCV, HBsAg patients.
- Those not willing to participate or give consent
- Those did not contain any medications or OPD prescriptions.

Microsoft Excel was used to enter the data, and the Statistical Package for the Social Sciences (SPSS Statistics for Windows, version 25.0) was used for analysis. Frequencies and percentages were among the descriptive statistical methods used to present the data.

Source of data: Patients in non-communicable disease outpatient departments were given copies of the MARS questionnaire, which they were asked to complete after being properly informed about the study and having their consent obtained. The researchers give individuals the assistance they need to comprehend and complete the questionnaire. Data that was received was recorded, preserved, and examined with prior approval from the hospital's administration.

Three components comprise the 10-item self-reporting multidimensional MARS questionnaire: medication adherence behavior (questions 1-4), attitude about taking medicine (questions 5-8), and unfavorable side effects and attitudes toward medication (questions 9-10).

Additionally, the questionnaire asks for the patient's initials, age, gender, diagnosis, and occupation.

Scores for each dimension are obtained by summing the items within each dimension. Each question has a yes or no response. A response consistent with non-adherence is coded as 0, whereas a response consistent with adherence is coded as 1. For questions 1-6 and 9-10, a no response is indicative of adherence and is coded as 1, while for questions 7 and 8, a yes response is indicative of adherence and is coded as 1. Total scores on the MARS may range between 0 and 10, with a higher score indicating better medication adherence.

MARS QUESTIONNAIRE

Patient Initials:	Age:	Gender:
Diagnosis:		
1. Do you ever forgot to take your medication?	Yes/No	
2. Are you careless at times about taking your medications?	Yes/No	
3. When you feel better , do you sometimes stop taking your medication?	Yes/No	
4. Sometimes if you feel worse, when you take the medication, do you Stop taking it?	Yes/No	
5. I take my medication only when I am sick ?	Yes/No	
6. It is unnatural for my mind and body to be controlled by medication?	Yes/No	
7. My thoughts are clear on medication?	Yes/No	
8. By staying on medication, I can prevent getting sick?	Yes/No	
9. I feel weird like a' Zombie' on medication?	Yes/No	
10. Medication makes me feel tired and sluggish?	Yes/No	

Chart 1: MARS Questionnaire

Socio-Demographic Characteristics: Male participants made up over half (51%) of the 306 individuals, with a mean age of 56.8 years. Of the survey participants, about two-thirds (66.4%) lived in cities. As for the educational level, over one-third (30.6%) of the respondents couldn't read or write. Approximately 40.2% of research participants earned less than 5,000 per month.

Study Participants' Personal and Clinical Characteristics: The majority of research participants (81.3%) did not smoke, and over two-thirds (69.8%) abstained from drinking. Most of the participants could carry out their everyday tasks on their own.

Almost 70% of individuals didn't utilize any form of reminder for their medications.

The majority of study participants (64%) had a single chronic disease. Hypertension is the most common disease seen in 66 participants (21.6%).

The next common diagnosis is Diabetes seen in 54 participants (17.6%). Hypertension along with Diabetes was seen in 48 participants (15.6%), cerebrovascular accident seen in 42 participants (13.7%), Hypertension along with cerebrovascular accident seen in 36 participants (11.76%), Hypertension with Diabetes and Cerebrovascular accident seen in 18 participants (5.88%), Generalized tonic-clonic seizures seen in 12 participants (3.92%), then cerebrovascular disease, goiter, coronary artery disease, coronary artery disease with hypertension seen 6 persons each (1.96%).

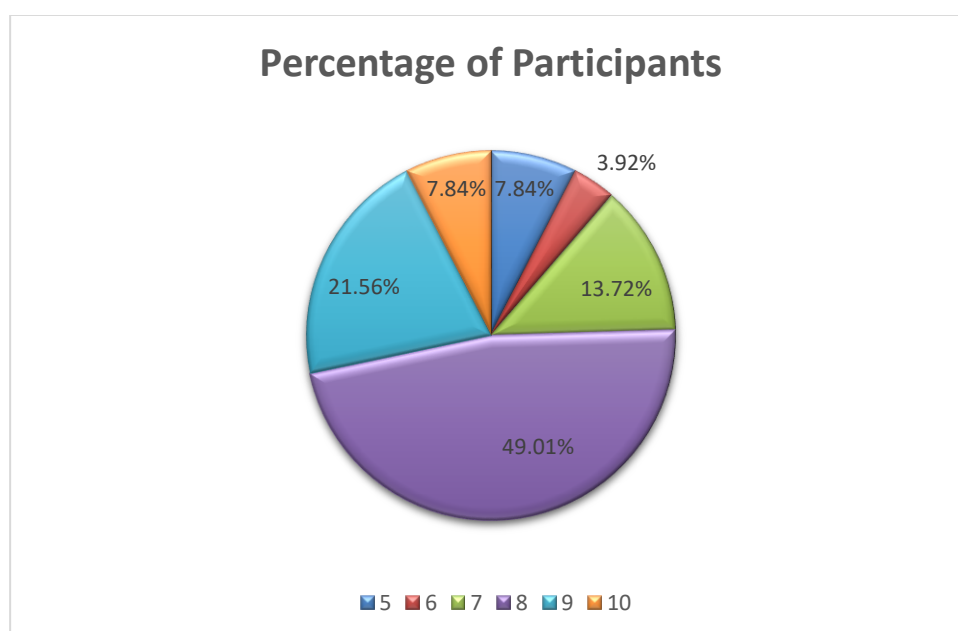
More than half of the participants had a disease duration of less than 4 years (range: 1–15 years). Majority of the respondents (72.5%) received 1–3 medications (range 1–6) per day. Around two-thirds of the patients (62.3%) had monthly treatment follow-up. In terms of patient-provider communication, nearly all patients (96%) reported to have good communication and a positive perception of the quality of care.

Table 1: Response Percentage for MARS Questionnaire

Adherence to medication MARS Questionnaire	A Response indicating Good adherence	Number of Pa- tients (n=306)	Response Percentage
1. Do you ever forget to take your medication?	"No"	278	90.8%
2. Are you careless at times about taking medication?	"No"	278	90.8%
3. When you feel better do you sometimes stop taking your medication?	"No"	192	64.7%
4. Sometimes if you feel worse when you take the medicine do you stop taking it	"No"	126	41.1%
5. I take my medication only when I am sick	"No"	84	27.4%
6. It is unnatural for my mind and body to be controlled by medication	"No"	278	90.8%
7. My thoughts are clearer on medication	"Yes"	306	100%
8. By staying on medication, I can prevent getting sick	"Yes"	288	94.1%
9. I feel weird like a zombie on medication	"No"	300	98.03%
10. Medication makes me feel tired and sluggish	"No"	300	98.03%

Table 2: Percentage of Participants with MARS Rating

S.NO	MARS Rating	Number of Participants	Percentage of Participants
1	5	24	7.84%
2	6	12	3.92%
3	7	42	13.72%
4	8	150	49.01%
5	9	66	21.56%
6	10	12	7.84%

**Figure 1: Percentage of Participants with MARS Rating**

According to the MARS Questionnaire, a score of greater than six denotes good medication adherence, whereas a score of fewer than six denotes poor medication adherence. Of the 306 participants,

282 were rated higher than 6. The study found that while 7.84 percent of patients had poor medication adherence, the majority (92.15%) had good medication adherence. (Table 3, figure2).

Table 3: Percentage of Medication Adherence

S.No	Good Adherence	Poor Adherence
1.	92.15%	7.84%

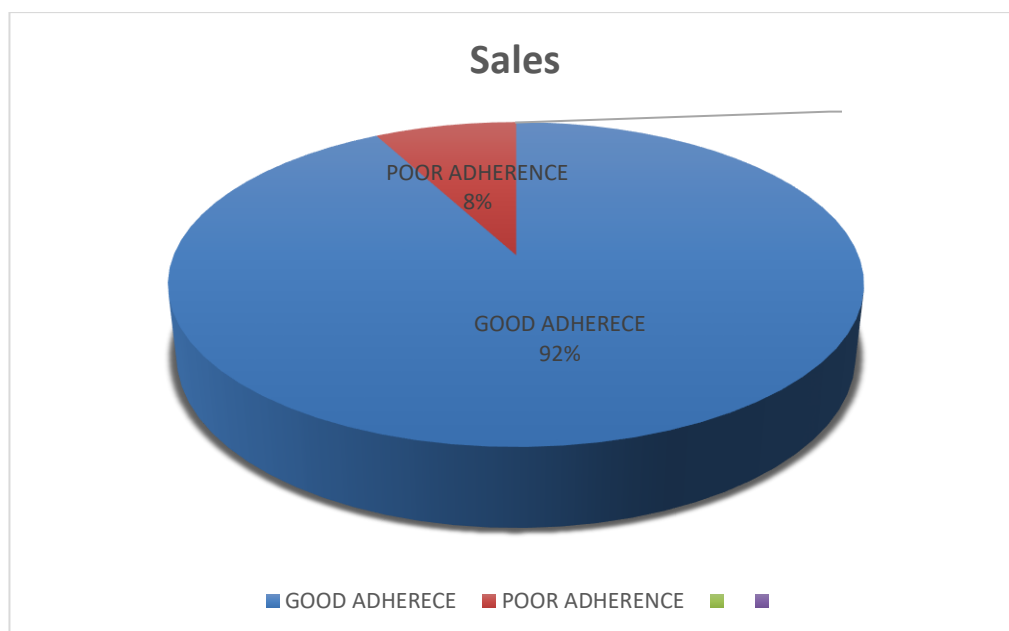


Figure 2: Percentage of Medication Adherence

Discussion

The 10-item MARS is a multifaceted self-reporting tool that describes three aspects: medication adherence behavior (items 1-4), attitude about taking medicine (items 5-8), and unpleasant medication side effects and attitudes (items 9-10). The intensity of drug consumption throughout therapy and persistence over the entire therapy period are considered aspects of medication adherence behavior.

The total of the items in each dimension yields the score for that dimension. Every question has a yes/no answer. Responses that are consistent with adherence are coded as 1, whereas those that are consistent with non-adherence are coded as 0. While a yes response for questions 7 and 8 indicates adherence and is coded as 1, a no response for questions 1-6 and 9-10 indicates adherence and is coded as 1. A higher score on the MARS indicates better drug adherence. Total scores can vary from 0 to 10.

Poor drug adherence was shown to be four times as common in patients who strongly believed that medications were harmful than in those who did not. On the other hand, poor drug adherence was found to be less common among those who held strong personal beliefs about the importance of pharmaceuticals. Some of the most common rea-

sons for patient's nonadherence include the following aspects groups: demographic, sociocultural, behavioral, etc. which relate to [6,7,8]: forgetfulness, cultural, religious beliefs, lack of understanding of the disease, physical, mental, emotional state, physical difficulties in the context of limited abilities, lack of involvement in the treatment and decision-making process, side effects, various demographic factors such as gender, education, marital status, etc., high costs, complexity of treatment, limited access to medical institutions, high expectations, etc. Treatment for many diseases necessitates alterations to everyday routines and lifestyles, which can be problematic for many patients, particularly if family and friends are not supportive. Various methods and strategies can be used to improve the level of adherence.

One of these is the enhancement of collaboration between patients and healthcare providers, with a focus on main areas: analyzing the amount of time that doctors need to spend with patients; improving the relationship between patients and doctors; improving the communication skills of healthcare providers; educating patients; discussing patients' beliefs and expectations; offering support and motivation; analyzing the patient's status (economic, physical, mental, etc.); discussing and finding appropriate solutions to side effects; discussing the

need to change one's lifestyle, etc. Depending on how data is gathered, medication adherence rates vary amongst studies. The reported rates of non-adherence varied widely, most likely as a result of variations in the definitions of adherence and non-adherence employed as well as other variations in the study methodologies.

In 4 research studies, patients' doctors administered and completed questionnaires; these studies had lower nonadherence rates than the others [9,10,11,12]. In one study when physicians and patients self-reported data on adherence, the doctors underestimated the degree of drug adherence; they estimated the nonadherence rate to be 29%, whereas patients' self-reports provided an estimate of 48%. Drug nonadherence rates ranged from 2.3% to 49.5% in seven studies involving hypertensive patients and from 1.4% to 27.1% in four trials including diabetic patients. However, using the MARS questionnaire, we found that 92.15% of patients with non-communicable diseases who attend our hospital have good medication adherence. Higher medication adherence in our study may be due to the current government recognition of the importance of health, increased health awareness programs, and health education through various channels, such as social media and mass media, as well as more healthcare facilities, better literacy, and increased health awareness.

Conclusion

Health outcomes, overall healthcare expenses, and life quality and longevity can all be significantly impacted by medication adherence. Achieving medication adherence and persistence requires active patient and healthcare team engagement. Effective doctor-patient communication and health education from paramedical personnel, such as pharmacists, can enhance adherence, and have a beneficial effect on patient care, and yield. Medication adherence could be furthermore successfully improved with a mix of behavioral, educational, reminder-based, and dose-simplification strategies.

References

1. Dobbels F, Van Damme-Lombaert R, Vanhaecke J, De Geest S. Growing pains: non-adherence with the immunosuppressive regimen in adolescent transplant recipients. *Pediatr Transplant* 2005. Jun;9(3):381-390 10.1111/j.1399-3046.2005.00356.x
2. Jackevicius CA, Mamdani M, Tu JV. Adherence with statin therapy in elderly patients with and without acute coronary syndromes. *JAMA* 2002. Jul; 288(4):462-467 10.1001/jama.288.4.462.
3. Haynes RB, McDonald HP, Garg AX. Helping patients follow prescribed treatment: clinical applications. *JAMA* 2002. Dec;288(22):2880-2883 10.1001/jama.288.22.2880.
4. Col N, Fanale JE, Kronholm P. The role of medication noncompliance and adverse drug reactions in hospitalizations of the elderly. *Arch Intern Med* 1990. Apr;150(4):841-845 10.1001/archinte.150.4.841.
5. Sullivan S, Kreling D, Hazlet T. Noncompliance with medication regimens and subsequent hospitalizations: A literature analysis and cost of hospitalization estimate. *J Res Pharmaceut Econ* 1990;2:19-33 [Google Scholar] [Ref_list]
6. Kaplan A., Price D. (2020). Treatment Adherence in Adolescents with Asthma. *Journal of Asthma and Allergy » Volume 13*, str. 42.
7. Shah K.N., Cortina S., Ernst M.M., Kichler J.C. (2015). Psoriasis in childhood: effective strategies to improve treatment adherence. *Psoriasis (Auckl)*, 5: 43–54. (Pristupni link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5683111/>)
8. Ferdinand C.K., Senatore F.F. i ostali (2017). Improving Medication Adherence in Cardiometabolic Disease: Practical and Regulatory Implications. *JACC VOL. 69, NO. 4*. 7
9. Bassili A et al. Current health care of childhood bronchial 3. Asthma in Alexandria, Egypt. *Eastern Mediterranean Health Journal*, 1998, 4:575–584.
10. Roaeid RB, Kablan AA. Profile of diabetes health care at Beng11. hazi Diabetes Centre, Libyan Arab Jamahiriya. *Eastern Mediterranean Health Journal*, 2007, 13:168–176.
11. Khattab MS et al. Compliance and control of diabetes in a fam13. ily practice setting, Saudi Arabia. *Eastern Mediterranean Health Journal*, 1999, 5:755–765.
12. Al-Saffar N et al. Effect of information leaflets and counselling 15. On antidepressant adherence: open randomised controlled trial in a psychiatric hospital in Kuwait. *International Journal of Pharmacy Practice*, 2005, 13:123–132.