Prevalence and Factors Associated with Medication Nonadherence in Patients with Major Psychiatric Disorders in Southern India

Jose M. Delcine, M.D., Hiremath B. Shivanand, M.D., Mangalwedhe B. Sameer, M.D., C. Arunkumar, M.D.*, M.S. Anusha, M.D., Mahesh Desai, D.N.B.

Department of Psychiatry, Karnataka Institute of Medical Sciences, Hubballi, Karnataka, India

Abstract

Objectives: Historically, nonadherence to medication has been a major problem faced by health care workers while treating chronic illnesses. Nonadherence to psychotropic medications is known to be associated with poorer treatment outcomes, remarkable risk, and cost to the medical system in managing psychiatric illness. For care providers, partial compliance or discontinuation of medications represents the difficulty of maintaining treatment successes over time. In this study, we intended to assess medication adherence and to understand the reasons for nonadherence in patients with major psychiatric disorders in southern India. **Methods:** This is a cross-sectional observational study, done from January to June 2023. With *the International Classification of Diseases 10th Revision* diagnosis, we assessed patients with psychotic disorders, bipolar affective disorders, and major depressive disorder. The Medication Adherence Rating Scale (MARS) was used to assess medication adherence. The patients also completed copies of semi-structured questionnaire on their sociodemographic characteristics, their medications, and reasons for nonadherence. **Results:** A total of 147 subjects were assessed. We found that 68.0% of subjects were poorly adherent to the treatment based on MARS, and that only 32.0% of them were strictly adherent to the treatment. The reasons for poor adherences to the medication treatment were carelessness or forgetfulness (21.8%), adverse effects of the medications (16.3%), and the perception of the subject of feeling better (15.6%). **Conclusion:** More than two thirds of the subjects was found to be non-adherent to the medications. Assessing various reasons for medication adherence will help find strategies to improve medication adherence and thus outcome of the treatment.

Key words: medication compliance, Medication Adherence Rating Scale, carelessness or forgetfulness, adverse effects of the medications
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Introduction

Because of the chronicity of major mental illnesses like psychotic spectrum disorder, bipolar affective disorder (BPAD), and depressive disorder, they are the leading cause of years lived with disability [1]. In mental health care, uncertainty about adherence affects the effectiveness of treatment. The full benefit of medications is achieved only if patients follow prescribed treatment regimens as per the expert advice [2].

World Health Organization's operational definition for nonadherence is "missing medications three consecutive times, two times in a week, five times in a month or change in the dose of the medications without the advice of the prescribing physician" [3]. The degree to which an individual follows medical advice is a major concern in every medical specialty. Poor adherence to psychiatric medication regimens is a major obstacle to the effective care of persons who have chronic mental illness [2].

A study [4] done in India has shown adherence from that patients have low adherence (24.4%), through medium adherence (24.4%), and to high adherence (41.7%). No significant associations were observed between nonadherence and sociodemographic characteristics of subjects. Recovery from illness (21.9%), forgetfulness (19.8%), frequency of drug

*Corresponding author. C Arunkumar, Karnataka Institute of Medical Sciences, Hubballi - 580021 Karnataka, India.
E-mail: C. Arunkumar <bhshiv@gmail.com>

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regimen (17.6%), and adverse effects (16.5%) were found to be major reasons for poor adherence. The results also showed that people suffering from major depressive disorder (34.1%) are most likely to be noncompliant with the treatment given, followed by bipolar disorder (35.2%) and schizophrenia (26.4%) [4].

Another study showed that lower insight, higher internalized stigma, loss and grief are predictors of lower treatment adherence, and that low treatment adherence has been found to be associated with lower quality of life [2].

The range of medication nonadherence is reported to be 28%–52% for major depressive disorder, 20%–50% for bipolar disorder, 20%–72% for schizophrenia, and 57% for anxiety disorders [5-8]. About 40% of patients stop taking their prescribed antipsychotic medication within one year, and about 75% of them discontinue their medication within two years [7]. Suboptimal adherence to psychotropic medications has been associated with relapse, remarkably more psychiatric hospitalizations, emergency department visits, poorer mental functioning, lower life satisfaction, more disability-related absences from work, greater substance use, increased suicidal behavior, poorer adherence to medications for comorbid medical conditions, and increased health-care costs [6].

Previous studies from developed countries attributed the reasons for nonadherence to antipsychotic medications, including limited insight, low therapeutic alliance, presence of positive symptoms, comorbid substance abuse, unemployment, low social functioning, and side effects [6, 7]. Although there is a dearth of evidence on nonadherence from developing countries, studies from Africa showed that poverty, lack of family support, perspective of illness and stigma, lack of insight, failure to improve with treatment, and long queues when attending outpatient appointments are the important reasons for nonadherence [9]. Meanwhile, developing countries in Asia showed that financial problems, distance from hospitals, social and cultural myths, illiteracy and lack of insight, and side effects are the reasons for nonadherence [4].

There are well-established reports on the factors associated with medication nonadherence in general clinical practice in the Indian population [4, 8, 10]. But, there is a paucity of data on medication adherence in Indian psychiatric patients. Therefore, in this study, we intended to study the prevalence and factors associated with medication nonadherence in patients with severe mental illnesses.

Methods

Study participants

This is an observational, cross-sectional, hospital-based study conducted at the psychiatry unit of a medical college hospital in the southern part of India. Ethics committee at Karnataka Institute of Mental Sciences at Hubballi, Karnataka, approved the study protocol (Registration number = RCR/4861insti/KA/2013/RR-16 and date of approval = January 22, 2021) requiring to obtain written informed consents was from the study patients and caregivers. If the patient was unable to give valid consent, the consent was taken from the caregivers or legally appointed representative of the patient.

The study was conducted over a period of six months, from January to June 2023. The sample size was calculated considering the prevalence of medication nonadherence of around 43% in psychiatric patients and taking into consideration a 95% confidence interval and allowable error 8%, the sample size was calculated using the formula, $n = 1.96^2 \times p (1 - P)/d$. Where, n = sample size 1.96 = Z value for 95% confidence interval, p = estimated prevalence d = allowable error. The sample size for this study was calculated to be 147.

Study tools
International Classification of Diseases 10th Revision

We used the manual of *International Classification of Diseases 10th Revision* (*ICD 10*) [11], for the diagnosis of psychotic disorders, BPAD and major depressive disorder, and also to rule out other psychiatric disorders. A clinical interview method was used for using this manual for the diagnosis of psychiatric disorders.

Medication Adherence Rating Scale (MARS)

The copy of Medication Adherence Rating Scale (MARS) [12] was used to assess medication adherence. The MARS is a 10-item self-reporting multidimensional instrument describing three dimensions: medication adherence behavior, attitude toward taking medication and negative side effects and attitudes to psychotropic medication. Score less than six is poor adherence. The MARS has been shown to have good psychometric properties, with Cronbach's alpha of 0.77 and internal consistency reliability of α = 0.75 [12]. Thus, the MARS satisfactorily predicts nonadherence.

Clinical Global Impression Severity Scale

Clinical Global Impression Severity Scale (CGI-S) [13] was used to assess the severity of illness in study subjects in this study. The clinician makes a judgment about the total picture of patient: the illness severity, the patients' level of distress, and other aspects of impairment. CGI has two components to rate severity and improvement. In the study, only the scale to assess severity was used.

Procedures of collecting data

Using the convenience sampling method, patients aged between 18 and 65 years of all genders, who attended the psychiatry unit with the diagnosis of psychotic spectrum disorders, BPAD, and depressive disorder according to *ICD-10* [11] and those who were on medication for at least three months were included in the study. Patients with severe comorbidities such as organic brain disorders, neurocognitive disorders, mental retardation, epilepsy, head injury, and those who were not willing to give consent for the study were excluded from the study.

Patients who attended psychiatry outpatient clinics were offered to participate in the study. After the patients were confirmed for a diagnosis using *ICD 10* [11], we used a semi-structured questionnaire to assess the sociodemographic

profile of the subjects. The questionnaire also involved the reasons for nonadherence like patient related (stigma, lack of family support, carelessness, forgetfulness, and clarity about medication administration), illness related (long duration, improvement, and worsening of symptoms), medication-related (adverse effects, too many pills, costly, and unavailability), and physician related (unclear instructions and nonavailability of psychiatrist). The factors were based on previous studies [4, 6, 7]. This semi-structured questionnaire was administered by the interviewer. Medication adherence was assessed using the Medication Adherence Rating Scale (MARS) [12], CGI-S [13], to assess the severity of illness in subjects. Severity assessment was done at the time of assessment of medication adherence. Insight was assessed using routine mental status examination of insight and it was physician rated. It is graded as, Grade 1 - complete denial of illness, 2 - slight awareness of being sick and needing help, but denying at the same time, 3 - awareness of being sick, but it is attributed to external or physical factors, 4-awareness of being sick, due to something unknown in self, and 5- intellectual insight 6- Insight Scale [14]. Socioeconomic status was assessed by modified B. G. Prasad classification [15].

Statistical analysis

Study data were entered into Microsoft Excel data sheet. Categorical data were represented in the form of frequencies and proportions, n (%). The Chi-square test was used to test for significant differences in categorical variables. Fischer's exact test was used as a test of significance between groups for continuous variables if they were not fulfilling the criteria for the Chi-square test (2 × 2 tables only).

All the study data were analyzed using International Business Machines Statistical Package for Social Science software version 22 for Windows (IBM SPSS Inc., Armonk, New York, USA). The differences between groups were considered significant if p-values were smaller than 0.05.

Results

We found that out of a total of 147 study patients, only 47 patients (about 32% of them) belonged to the good treatment adherence group, based on the score of the Medication Adherence Rating Scale [12].

As shown in Table 1, 43.5% of patients belonged to the age group of 46–60 years, followed by 31–45 years (37.4%). The mean age of the subjects was 42.87 ± 11.11 years. Most subjects (59.9%) were residing in rural areas, completed primary education (39.5%), and were employed (55.1%). Most subjects belonged to lower socioeconomic class were 31.3%, belonged to nuclear family (41.5%), and were married (70.7%).

As shown in Table 2, the most common diagnosis was depressive disorder 25.2%. The next common diagnosis was BPAD (21.1%), followed by other nonorganic psychosis (18.4%).

The severity of illness among the subjects was assessed by CGI. Accordingly, most subjects were mildly ill (42.2%), then were moderately ill (28.6%), and followed by markedly ill (12.2%).

Table 1. Sociodemographic profile of the study patients

Variable	n (%)
Age (years)	
< 30	25 (17)
31–45	55 (37.4)
46–60	64 (43.5)
> 61	3 (2.0)
Gender	
Male	84 (57.1)
Female	63 (42.9)
Locality	
Rural	88 (59.9)
Urban	59 (40.1)
Education level	
Illiterate	20 (13.6)
Primary	58 (39.5)
Secondary	54 (36.7)
Graduate	15 (10.2)
Occupation	
Unemployed	66 (44.9)
Employed	81 (55.1)
Socioeconomic status	
Upper	17 (11.6)
Upper middle	14 (9.5)
Middle	28 (19.0)
Lower middle	42 (28.6)
Lower	46 (31.3)
Marital status	
Unmarried	34 (23.1)
Married	104 (70.7)
Separated	9 (6.1)

Table 2. Distribution of the study subjects based on the diagnosis

Diagnosis	n (%)
F20 (schizophrenia)	26 (17.7)
F22 (persistent delusional disorder)	5 (3.4)
F23 (acute transient psychotic disorder)	21 (14.3)
F28 (other nonorganic psychosis)	27 (18.4)
F32 (BPAD)	31 (21.1)
F33 (depressive disorder)	37 (25.2)

BPAD, bipolar affective disorder

As shown in Table 3, the insight of the subjects was assessed with routine mental status examination [13]. Majority of the subjects were aware of being sick, either by attributing to external or physical factors (23.8%) or by something unknown in self (23.8%).

As shown in Table 4, various factors were assessed as the possible reasons for nonadherence to the treatment among the subjects. Most subjects were poorly adherent to the treatment due to carelessness or forgetfulness (21.8%). The next common causes were adverse effects of the medications (16.3%), followed by the perception of the subject of feeling better (15.6%). The treatment adherence was observed to be poorer

Table 3. Distribution of the study subjects based on clinical rating of insight

Clinical rating of insight	n (%)
Complete denial of illness	16 (10.9)
Slight awareness of being sick and needing help, but denying it at the same time	15 (10.2)
Awareness of being sick, but it is attributed to external or physical factors	35 (23.8)
Awareness of being sick, due to something unknown in self	35 (23.8)
Intellectual insight	28 (19.0)
True emotional insight	18 (12.2)

Table 4. Reasons for nonadherence to treatment among the study subjects

Reasons for nonadherence	n (%)
Patient-related factors	
Stigma	3 (2.0)
Lack of family support	8 (5.4)
Carelessness/forgetfulness	32 (21.8)
Unclear about administration	1 (0.7)
Medication-related factors	
Adverse effects	24 (16.3)
Costly	22 (15.0)
Too many pills	3 (2.0)
Nonavailability	5 (3.4)
Illness-related factors	
Long duration of illness	8 (5.4)
Feeling better	23 (15.6)
No improvement	11 (7.5)
Worsening of symptoms	2 (1.4)
Physician-related factors	
Lack of adequate instructions	3 (2.0)
Nonavailability of psychiatrist	2 (1.4)

Table 5. Association between reasons for nonadherence among the study subjects and treatment adherence based on Medication Adherence Rating Scale

Reasons for nonadherence	Treatment adherence (based on MARS)	
	Poor, n (%)	Good, n (%)
Patient related		
Present	24 (24)	20 (42.6)*
Absent	76 (76)	27 (57.4)
Medication related		
Present	38 (38.0)	16 (34.0)
Absent	62 (62.0)	31 (66.0)
Illness related		
Present	35 (35.0)	9 (19.1)*
Absent	65 (65.0)	38 (80.9)
Physician related		
Present	3 (3.0)	2 (4.3)
Absent	97 (97.0)	45 (95.7)

*p < 0.05 significantly different between good and poor treatment adherence groups tested using Chi-square test
MARS, Medication Adherence Rating Scale

among the individuals in the age group of 46–60 years, who were males, from rural areas, completing primary education and being employed comparatively. Also, more in the lower middle class, nuclear family, and married individuals. But, in this study, we found no significant association between sociodemographic profile of the study subjects and treatment adherence based on MARS. The study was also found to have no significant association between the diagnosis of the study subjects and treatment adherence based on MARS.

As shown in Table 5, medication-related factors were responsible for poor adherence to treatment in 38.0% of cases. Also, the patients and illness-related factors were responsible for poor adherence in 24.0% and 35.0% of cases, respectively. We found that a significant association existed of patient- and illness-related factors with treatment adherence based on MARS.

As shown in Table 6, the treatment adherence was observed to be proportionally poorer among the individuals who were aware of being sick due to something unknown in self. Also, the subjects who were aware of being sick but attributed to external or physical factors had the next majority share in contributing for poorer adherence. Overall, the study was found to have a significant association ($p < 0.05$) between the clinical rating of insight of the study subjects and treatment adherence based on MARS.

Discussion

Nonadherence in our study was 68%, i.e., 105 out of 147 study patients. This study finding agrees with that reported in the previous studies [2, 4, 9, 16-20]. The range of nonadherence to treatment among the patients diagnosed with major psychiatric illnesses was found to be 39.6%–88.2%.

As shown in Table 1, variations in nonadherence depend on the type of study, diagnoses, insight, and sociodemographic profile of the study patients.

In the present study (Table 2), the most common diagnosis was found to be a depressive disorder (25.2%), followed by BPAD (21.1%) and other nonorganic psychosis (18.4%). This finding is different in that from various previous studies: Stress-related disorders have been found to be a majority in a study [5] (44.5%), and bipolar disorder is most common in another study (33.9%) from India [4]. But, psychosis is the most frequent diagnosis (35.9%) in a study from Africa [9]. This study finding affirms that the prevalence of specific psychiatric disorders varies depending on the area and the population included in the study.

As shown in our study (Table 3), the insight of the subjects in the present study was assessed by routine mental status examination. Most of our studies, the subjects were aware of being sick, either through attributing to external or physical factors (23.8%) or through something unknown in self (23.8%). There is a paucity of studies about the association between grades of insight and medication adherence in the Asian population. Insight probably affects the adherence of the individuals toward the treatment. Awareness about one's own illness makes him or her responsible for the measures

Table 6. Association between clinical rating of insight of the study subjects and treatment adherence based on Medication Adherence Rating Scale

Clinical rating of insight	Treatment adherence (MARS)	
	Poor, n (%)	Good, n (%)
Complete denial of illness	14 (14)	2 (4.3)*
Slight awareness of being sick and needing help but denying it at the same time	11 (11)	4 (8.5)*
Awareness of being sick, but it is attributed to external or physical factors	22 (22)	13 (27.7)*
Awareness of being sick due to something unknown in self	31 (31)	4 (8.5)*
Intellectual insight	14 (14)	14 (29.8)*
True emotional insight	8 (8)	10 (21.3)*

*$p < 0.05$, significantly different between good and poor treatment adherence groups based on MARS, tested using the Chi-square test
MARS, Medication Adhrence Rating Scale [11]

to be taken to recover. Thus, it increases adherence. As the insight increases, adherence to medicines also increases [16].

In our study (Table 4), we assessed various reasons related to patient, medication, illness or the consulting physician responsible for treatment nonadherence. Majority of the subjects were poorly adherent to the treatment due to carelessness or forgetfulness (21.8%). The next common causes were adverse effects of the medications (16.3%), followed by the perception of the subject of feeling better (15.6%). This finding is similar to that in previous studies [2], where the most common cause has been found to be personal obligations of the patients (18.1%), followed by adverse drug reactions (11.0%), and self-checking for the reappearance of the symptoms (7.5%) and another study [4], majority of the subjects have been found to stop medicines because they have been feeling they got recovered from the illness (21.9%), followed by the causes such as forgetfulness (19.8%), and increased frequency of the drug regimen (17.6%).

Table 5 shows the analysis of association of sociodemographic characteristics of the subjects with the adherence of the individuals to the treatment. We found that the treatment adherence was observed to be poorer among the individuals in the age group of 46–60 years, males, from rural areas, completing primary education and being employed comparatively, and those more in lower middle class, nuclear family, and married individuals. But, we did not find any significant association between sociodemographic profile of the study subjects and treatment adherence based on MARS. In a previous study [2], a decreased level of education, increased duration of treatment, and poor economic status can affect the adherence to the treatment. In another previous study [4], poor adherence is more among adult married males with lower education, from rural areas and working groups, although a significant relation has not been reached.

As also shown in Table 4, the treatment adherence in the present study was observed to be proportionally poorer among the individuals with psychotic disorder. On the contrary, treatment adherence was poor among the individuals with BPAD and depressive disorder in lower proportions comparatively. But, in this study, we did not find any significant association between the diagnosis of the study subjects and treatment adherence based on MARS. However, many previous studies observing analyzed the association in specific

diagnosis, has not been found to have any significant relation, where poor adherence was significantly more among those with depression [2], bipolar disorder [4], and schizophrenia [9]. Those discrepancies need further research for clarification.

In the present study (Table 4), medication-related factors were found to be responsible for poor adherence to treatment in 38.0% of cases. Also, the patients and illness-related factors were responsible for poor adherence in 24.0% and 35.0% of cases, respectively.

Overall, the study (Table 5) was found to have a significant association of patient-related ($p < 0.05$) and illness-related ($p < 0.05$) factors with treatment adherence based on MARS. This finding is different from that in the other studies [2, 10, 21, 22], where drug-related factors were found to be the most common factor in causing poor adherence to the treatment.

A significant association ($p < 0.05$) existed between the clinical rating of insight of the study subjects and treatment adherence based on MARS (Table 6). Although few studies are available to understand this association, still the study results can deduce the fact that poor insight plays vital rôle in less adherence to the treatment, which is even evident from the findings in the study by Velligan et al. [22].

The treatment adherence was observed to be proportionally poorer among the individuals who were mildly ill. Also, the subjects who were moderately ill had the next majority share in contributing to poorer adherence. But, no significant association existed between the severity of illness (CGI) of the study subjects and treatment adherence based on MARS. These findings are similar to those in previous studies [23, 24], where the severity of the illness is remarkably milder among those who were nonadherent to medications. Medication nonadherence is multifactorial and do not only depend on the severity of illness.

Study limitations
The readers are warned not to over-interpret the study findings because this study has three limitations:
- The sample size in this study is considerably adequate for the present study based on the availability of the cases in the study center. But, a bigger sample size would have been a better strength for statistical power.
- The generalization of the study data is limited because of the use of convenience sampling. We are cautioned that the

representation for the whole state of Karnataka or the whole of India is doubtful. Therefore, a randomization sample and multi-centric study would have better sample representation.

• The duration of the study and frequency of follow-ups were sufficient enough for accurate assessment of the outcome in the study. But, other factors such as the presence of comorbidities, duration of illness, frequency, and dosage of medications which may affect the adherence to treatment have not been recorded. There were no follow up assessments.

Summary

Based on 147 study subjects as a convenient sampling, we found that 68.0% of subjects were poorly adherent to the treatment based on MARS, and that only 32.0% of the subjects were strictly adherent to the treatment. The reasons of poor adherences to the medication treatment due to were carelessness or forgetfulness (21.8%), adverse effects of the medications (16.3%), and the perception of the subject of feeling better (15.6%). We suggest that assessing various reasons for medication adherence can help formulate strategies to improve medication adherence and, thus, the outcome of the treatment.

Data Availability Statement

Original study data used in this study can be shared if contact with the corresponding author is made.

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Conflicts of Interest

The authors declare no conflicts of interest in this study.

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