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Medication adherence and its determinants in patients with schizophrenia: A cross-sectional observational study.

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Abstract

Background: Medication adherence is critical for optimal clinical outcomes in schizophrenia. Non-adherence contributes to symptom relapse, increased hospitalizations, and poor functional recovery. Identifying the factors associated with adherence may guide targeted interventions.

Objectives: To assess the level of medication adherence among patients with schizophrenia and to identify sociodemographic and clinical factors associated with poor adherence.

Methods: This cross-sectional observational study was conducted on 100 patients diagnosed with schizophrenia attending the psychiatry outpatient department of a tertiary care hospital. Medication adherence was measured using the Medication Adherence Rating Scale (MARS). Sociodemographic data, clinical history, and relevant correlates such as insight, substance use, and family support were recorded. Statistical analyses included chi-square tests, t-tests.

Results: Among the 100 patients, 37% exhibited high adherence, 26% showed moderate adherence, and 37% had low adherence, with a mean MARS score of 5.6 ± 2.3. Poor adherence was more frequent among unemployed and less-educated individuals, whereas no significant associations were noted with age or marital status. Clinically, poor adherence was significantly linked to longer illness duration ($p = 0.002$), poor insight ($p < 0.001$), absence of family support ($p = 0.001$), and concurrent substance use ($p = 0.003$). Multivariate analysis further confirmed poor insight (AOR = 5.61, $p < 0.001$), illness duration beyond five years (AOR = 2.84, $p = 0.015$), substance abuse (AOR = 2.91, $p = 0.023$), and lack of family support (AOR = 3.42, $p = 0.025$) as independent predictors of poor adherence.

Conclusions: The findings highlight a high burden of non-adherence in schizophrenia, predominantly influenced by modifiable psychosocial and clinical factors. Interventions must be tailored to improve insight, support systems, and address substance use.

Recommendations: Early psychoeducation, active caregiver engagement, and dual diagnosis interventions are essential strategies to enhance adherence and prevent relapse among patients with chronic schizophrenia.

Keywords: *Schizophrenia, Medication Adherence, Medication Adherence Rating Scale, Insight, Substance Use, Family Support, Predictors, Non-compliance, Mental Health, Psychopharmacology*

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Introduction

Schizophrenia is a severe and chronic psychiatric disorder that significantly impairs cognition, perception, affect, and social functioning. Affecting nearly 1% of the global population, it contributes substantially to disability-adjusted life years and healthcare burden worldwide [1]. Antipsychotic medications are the cornerstone of treatment and play a crucial role in symptom stabilization and relapse

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prevention. However, **non-adherence to prescribed medications remains a pervasive challenge**, with estimates suggesting that 40–60% of individuals with schizophrenia do not adhere consistently to treatment regimens [2].

Medication non-adherence is multifactorial, often stemming from a complex interplay of clinical, psychosocial, and systemic factors. Poor insight, substance abuse, lack of caregiver involvement, cognitive deficits, and side effects are consistently reported contributors [3]. Furthermore, institutional settings and sociocultural environments heavily influence adherence behaviors, especially in low- and middle-income countries [1,4].

The consequences of poor adherence are profound. It is associated with increased relapse rates, rehospitalization, treatment resistance, and diminished quality of life [2,5]. Adolescents and young adults with schizophrenia may face additional challenges, including stigma, denial of illness, and conflict with authority, further impairing adherence [5]. In contrast, community-based support and psychoeducation have been shown to enhance compliance in both urban and rural populations [6].

Despite numerous studies globally, there remains a paucity of data from smaller tertiary care centers in India, where socio-demographic dynamics and family structures differ substantially. In this context, the present study was undertaken to assess the level of medication adherence among individuals with schizophrenia and to identify the clinical and psychosocial correlates associated with non-adherence in a tertiary care hospital in South India.

Materials and Methods

Study Design and Setting

This hospital-based, cross-sectional observational study was conducted in the Department of Psychiatry at Government Medical College and General Hospital, Bhadradri Kothagudem, Telangana, India, over nine months from August 2024 to April 2025. The institution is a 500-bed tertiary care teaching hospital serving both urban and rural populations of Khammam and Bhadradri districts. It provides comprehensive outpatient, inpatient, and emergency services, with specialized psychiatric care for schizophrenia, mood disorders, and substance use disorders. The Psychiatry Department operates a dedicated outpatient clinic with an average daily attendance of 60–80 patients, offering an appropriate setting for the recruitment of stable individuals with schizophrenia.

Study Population

Patients diagnosed with schizophrenia, attending the psychiatry outpatient department during the study period, were screened for eligibility. The diagnosis of schizophrenia was confirmed using the criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5).

Inclusion Criteria

Patients aged 18–65 years
Diagnosed with schizophrenia for at least one year
On stable antipsychotic treatment for a minimum of three months
Provided informed written consent

Exclusion Criteria

Presence of comorbid intellectual disability or organic brain syndromes
Acute psychotic exacerbation requiring immediate hospitalization
Refusal to participate

Sample Size

A total of **100 patients** meeting the inclusion criteria were recruited using consecutive sampling.

The required sample size was calculated using the formula:
$n=Z2 \cdot p \cdot (1-p)d2$
where n = sample size, Z = standard normal deviate at 95% confidence (1.96), p = anticipated prevalence of poor adherence, and d = margin of error. Based on previous Indian studies, the prevalence of poor adherence among patients with schizophrenia was estimated at 40% [12,13]. Taking $p = 0.40$, $d = 0.10$, and $Z = 1.96$, the minimum sample size required was 92. To account for non-response and incomplete data, we included 100 patients in the study.

Data Collection Tools and Procedure

Data were collected using a structured proforma that included sociodemographic details, clinical history, treatment characteristics, and psychosocial variables. Medication adherence was assessed using the **Medication Adherence Rating Scale (MARS)**, a validated 10-item self-report instrument designed for psychiatric populations. Scores ranged from 0 to 10, with higher scores indicating better adherence.

Insight into illness was evaluated using clinical interviews, and family support was assessed through direct questioning regarding the presence of a consistent caregiver or emotional

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support system. The history of substance use was also recorded.

Bias

Several potential sources of bias were considered. **Selection bias** was minimized by using consecutive sampling of all eligible patients during the study period. **Recall bias** was addressed by cross-verifying medication history with available prescription records and caregiver inputs. **Reporting bias** inherent to self-reported adherence (MARS scale) was reduced by ensuring confidentiality and conducting interviews in a private setting to encourage honest responses. Finally, **observer bias** was minimized by training the investigators in uniform data collection procedures and adhering to structured proformas.

Ethical Considerations

Ethical approval for the study was obtained from the Institutional Ethics Committee of Government Medical College, Kothagudem. Written informed consent was obtained from all participants before enrolment.

Statistical Analysis

Data were entered in Microsoft Excel and analyzed using SPSS version 26. Descriptive statistics were used for baseline characteristics. Associations between adherence and categorical variables were analyzed using chi-square tests, while continuous variables were assessed using independent t-tests. Variables found significant in univariate analysis ($p < 0.05$) were further included in a **multivariate logistic regression model** to identify independent predictors of poor adherence.

RESULTS

A total of 100 patients diagnosed with schizophrenia were enrolled in the study. The majority of participants (45%) were aged between 31 and 45 years, and 62% were male. Educational attainment varied, with 34% having completed secondary education, while 21% were illiterate. A significant proportion (62%) were unemployed, and over half were married (Table 1).

Patient Screening and Recruitment

During the study period, 118 patients with schizophrenia were screened for eligibility. Of these, 12 were excluded due to acute psychotic exacerbation requiring hospitalization, 3 had comorbid intellectual disability, and 3 declined participation. The remaining 100 patients met the inclusion criteria and were enrolled in the study.

Figure 1 shows the flow of participants through the study.

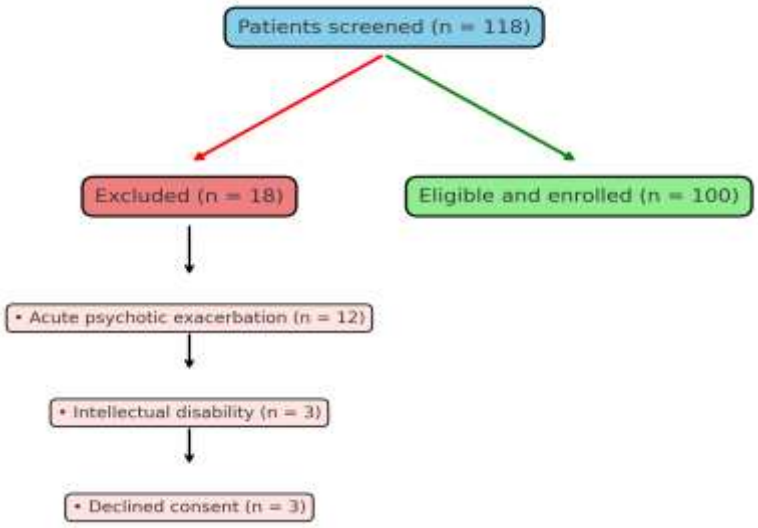

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Table 1: Sociodemographic Profile of Patients (N = 100)

Characteristic	Frequency (n)	Percentage (%)
Age Group (years)		
18–30	28	28.0
31–45	45	45.0
>45	27	27.0
Sex		
Male	62	62.0
Female	38	38.0
Education		
Illiterate	21	21.0
Primary	29	29.0
Secondary	34	34.0
Graduate & above	16	16.0
Marital Status		
Married	52	52.0
Unmarried	41	41.0
Divorced/Widowed	7	7.0
Employment Status		
Employed	38	38.0
Unemployed	62	62.0

Medication adherence, as assessed by the Medication Adherence Rating Scale (MARS), revealed that 37% of participants exhibited high adherence, while an equal proportion (37%) demonstrated low adherence. The mean MARS score was 5.6 ± 2.3, indicating moderate overall adherence levels in the cohort (Table 2).

Table 2: Medication Adherence Based on MARS Scores

Adherence Level	Frequency (n)	Percentage (%)
High Adherence	37	37.0
Moderate Adherence	26	26.0
Low Adherence	37	37.0
Mean MARS Score ± SD	**5.6 ± 2.3**	

Note: Medication adherence was assessed using the Medication Adherence Rating Scale (MARS), with scores ≤4 considered poor adherence, 5–7 moderate, and ≥8 as high adherence.

Sociodemographic Factors and Adherence

Table 2a. Association of sociodemographic characteristics with medication adherence (N = 100)

Sociodemographic Variable	Adherent (n = 63)	Non-Adherent (n = 37)	p-value
Age (<45 years / ≥45 years)	46 / 17	27 / 10	0.48 (NS)
Sex (Male / Female)	40 / 23	22 / 15	0.62 (NS)
Education (≤Secondary / ≥Graduate)	52 / 11	35 / 2	0.09 (NS)
Employment (Employed / Unemployed)	28 / 35	10 / 27	0.07 (NS)

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Marital Status (Married / Unmarried)	35 / 28	17 / 20	0.55 (NS)

NS: Not significant at p > 0.05

Analysis of sociodemographic factors such as age, sex, marital status, education, and employment status showed no statistically significant associations with adherence (all p > 0.05). Although non-adherence was more frequent among unemployed and less-educated patients, these trends did not reach statistical significance.

Clinical correlates of adherence were examined. Patients classified as adherent (defined as moderate or high adherence) had a significantly shorter duration of illness (6.2 ± 3.1 years) compared to non-adherent individuals (9.1 ± 4.2 years, $p = 0.002$). Insight status differed markedly: 77.8% of adherent patients had good insight, whereas 75.7% of non-adherent patients had poor insight ($p < 0.001$). Similarly, a higher proportion of adherent individuals reported family support (87.3% vs. 56.8%, $p = 0.001$), and substance use was more prevalent in the non-adherent group (48.6% vs. 15.9%, $p = 0.003$) (Table 3).

Table 3: Clinical Correlates of Adherence (N = 100)

Variable	Adherent (n = 63)	Non-Adherent (n = 37)	p-value
Duration of Illness (years)	6.2 ± 3.1	9.1 ± 4.2	0.002*
Insight (Good vs. Poor)	49 vs. 14	9 vs. 28	<0.001*
Family Support (Yes/No)	55 / 8	21 / 16	0.001*
Substance Use (Yes/No)	10 / 53	18 / 19	0.003*

$p < 0.05$ is considered statistically significant. Adherence is defined as a moderate or high MARS score.

Multivariate logistic regression analysis identified key predictors of poor adherence. Duration of illness exceeding five years (AOR = 2.84; 95% CI: 1.21–6.65; $p = 0.015$), poor insight (AOR = 5.61; 95% CI: 2.34–13.4; $p < 0.001$), lack of family support (AOR = 3.42; 95% CI: 1.17–9.98; $p = 0.025$), and concurrent substance abuse (AOR = 2.91; 95% CI: 1.15–7.35; $p = 0.023$) were independently associated with low adherence (Table 4)

Table 4: Multivariate Logistic Regression: Predictors of Poor Adherence

Predictor Variable	Adjusted Odds Ratio (AOR)	95% CI	p-value
Duration of illness >5 yrs	2.84	1.21 – 6.65	0.015*
Poor insight	5.61	2.34 – 13.4	<0.001*
Lack of family support	3.42	1.17 – 9.98	0.025*
Substance abuse	2.91	1.15 – 7.35	0.023*

Discussion

This study investigated the level of medication adherence and associated factors among patients with schizophrenia in a tertiary care setting in Telangana. The findings revealed that only 37% of participants had high adherence, while an equal proportion exhibited low adherence. The average MARS score of 5.6 reflects moderate adherence overall, aligning with recent studies from varied geographic and healthcare contexts [7,8].

A significant finding was the association between longer illness duration and poor adherence. Patients with schizophrenia for over five years were nearly three times more likely to be non-adherent, which supports earlier evidence that chronic illness may reduce motivation, increase psychological fatigue, and diminish treatment engagement over time [9,10].

Poor insight emerged as a robust independent predictor of non-adherence in our cohort. This is consistent with previous studies that identified impaired insight as a key barrier to sustained medication use, often linked to denial of illness and lack of perceived need for treatment [7,11]. Incorporating regular psychoeducation and insight-building interventions could therefore be essential for improving compliance.

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The role of **family support** in influencing adherence was also evident. Patients lacking consistent family involvement were significantly more likely to miss doses or discontinue medications. This finding is especially relevant in collectivist cultures like India, where family members play a central role in health-related decision-making. Studies have consistently demonstrated that supportive caregiving structures enhance medication adherence and continuity of care [12].

Another critical factor was **substance use**, which was independently associated with poor adherence. Substance abuse disrupts daily routines, reduces treatment prioritization, and exacerbates symptomatology, all of which negatively affect medication-taking behavior. Integrated management of co-occurring substance use disorders has been strongly advocated in recent meta-analyses and Indian studies [10,13].

Generalizability

The findings of this study are broadly applicable to similar tertiary care hospital settings in low- and middle-income countries, where family involvement and sociocultural factors play a key role in treatment adherence. However, external validity may be limited when extrapolating to high-income countries with different healthcare systems, patient support structures, and cultural contexts. Despite these differences, the identified predictors insight, family support, and substance use are consistent with global literature, supporting the relevance of our results across diverse populations.

Conclusion

This study highlights a substantial burden of medication non-adherence among patients with schizophrenia, with only one-third demonstrating high adherence. Key determinants of poor adherence included longer illness duration, poor insight, lack of family support, and substance abuse—all of which are modifiable through targeted interventions. These findings underscore the need for integrated care models that address both clinical and psychosocial domains. Routine insight-oriented psychoeducation, caregiver involvement, and substance use screening should be embedded into outpatient follow-up protocols. Improving adherence is essential not only to prevent relapses and rehospitalization but also to promote long-term functional recovery and reduce the overall healthcare burden of schizophrenia.

Strengths and Limitations

Strengths of this study include the use of a validated adherence scale (MARS), analysis of multiple psychosocial variables, and regression modeling to identify independent predictors. However, the **cross-sectional design limits causal inference**, and the reliance on self-reported adherence may introduce reporting bias. Additionally, the single-center setting might have affected generalizability.

Recommendations

To enhance medication adherence among individuals with schizophrenia, regular psychoeducation sessions focusing on illness awareness and the importance of consistent treatment should be implemented. Family members must be actively engaged in treatment planning and follow-up to strengthen social support systems. Screening and management of comorbid substance use disorders should be integrated into routine psychiatric care. Mental health services should incorporate adherence monitoring tools like MARS during outpatient visits. Additionally, training programs for healthcare providers should emphasize motivational interviewing and adherence counseling. Community-based outreach and follow-up programs may further improve continuity of care and reduce treatment dropouts in resource-limited settings.

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List of Abbreviations

MARS: Medication Adherence Rating Scale
DSM-5: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition
AOR: Adjusted Odds Ratio
CI: Confidence Interval
SPSS: Statistical Package for the Social Sciences
SD: Standard Deviation
OPD: Outpatient Department

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Conflict of interest
The authors declare no conflict of interest.

Author contributions
SKS-Concept and design of the study, results interpretation, review of literature, and preparation of the first draft of the manuscript. Statistical analysis and interpretation, revision of manuscript. **PC**-Concept and design of the study, results interpretation, review of literature, preparing the first draft of the manuscript, and revision of the manuscript.

Data availability
Data available on request

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Dr. Sakhamudi was recognized for his outstanding dedication and service during the COVID-19 pandemic with a Certificate of Appreciation. He was also honored by the Indian Association of Preventive and Social Medicine (IAPSM) for organizing the best public awareness campaign on HIV/AIDS on World AIDS Day.
He is registered with both the Telangana State Medical Council (TSMC) and the General Medical Council (GMC), United Kingdom. Dr. Sakhamudi's professional interests include internal medicine, medical education, public health advocacy, and academic research.**ORCID ID:**https://orcid.org/0009-0009-1659-7159

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