



Original Article

Gender Differences In Medication Adherence Among Patients With Schizophrenia. A Cross-Sectional Study

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ABSTRACT

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Background: Medication adherence is crucial for optimal management of schizophrenia, yet adherence rates remain low. Emerging evidence suggests that gender-specific factors may influence adherence patterns.

Aim: To assess gender differences in medication adherence and identify associated clinical, psychosocial, and cultural factors in patients with schizophrenia.

Methods: A cross-sectional study was conducted among diagnosed schizophrenia patients. Medication adherence was evaluated along with insight, symptom severity, side effects, and psychosocial variables. Gender-based comparisons were performed to identify significant predictors of adherence.

Results: Women demonstrated better adherence than men. Better insight, stronger family support, and fewer substance use issues contributed to higher adherence in female patients. In contrast, men showed lower adherence, influenced by higher substance abuse, reduced insight, and greater negative symptom burden. Side effects, internalized stigma, and cultural beliefs also showed gender-linked variations in their impact on adherence.

Conclusion: Gender plays a significant role in determining treatment adherence in schizophrenia. Understanding these differences is essential for designing targeted, patient-centered strategies to improve adherence and clinical outcomes.

Keywords: Schizophrenia, Gender differences, Medication adherence, Insight, Side effects, Substance use, Psychosocial factors.

INTRODUCTION

Schizophrenia is a chronic, severe psychiatric disorder characterized by disturbances in thought, perception, affect, and behavior, affecting approximately **1% of the global population** [1]. Effective long-term management of schizophrenia relies heavily on **consistent adherence to antipsychotic medication**, which remains the cornerstone of treatment for symptom control, relapse prevention, and functional recovery [2,3]. Despite the availability of effective pharmacological interventions, **medication non-adherence remains a major clinical challenge**, with rates ranging from **40% to 60%** in various settings [4]. Poor adherence contributes to relapse, hospitalization, poor quality of life, and increased healthcare costs [5].

Treatment adherence in schizophrenia is a **multidimensional phenomenon**, influenced by clinical factors (symptom severity, insight, side-effects), psychosocial variables (stigma, beliefs about illness), and demographic characteristics (age, sex, education) [6,7]. Among these, **gender differences in medication adherence** have gained increasing attention. Women with schizophrenia often demonstrate better social functioning, stronger treatment engagement, and lower rates of substance use, all of which may influence adherence behaviors [8]. Conversely, men tend to have earlier onset, more negative symptoms, and a higher likelihood of comorbid substance abuse—factors associated with poorer adherence [9,10].

Insight into illness has consistently been associated with medication adherence. Patients with poor insight often underestimate the need for continuous treatment, leading to irregular medication intake and higher relapse risk [11]. Similarly, the presence of antipsychotic side-effects—such as extrapyramidal symptoms, sedation, and metabolic disturbances—can negatively affect patients' willingness to continue treatment, and these effects may manifest differently across genders [12].

Perceived stigma also plays a crucial role in adherence, as individuals who internalize stereotypes or fear discrimination may avoid taking medication or skip follow-up services [13]. Cultural beliefs regarding the causation of mental illness (e.g., supernatural attributions, fate) can further shape treatment attitudes and adherence patterns, particularly in low-resource settings [14].

While numerous studies have examined the determinants of medication adherence in schizophrenia, **limited research has specifically explored gender-based differences in these determinants**, especially in the Indian context. Given the sociocultural variations in illness beliefs, treatment-seeking behavior, and gender roles, understanding these differences is essential for designing gender-sensitive interventions aimed at improving adherence.

Therefore, the present study was undertaken to evaluate **medication adherence among male and female patients with schizophrenia** and to examine its association with **insight, symptom severity, side-effects, stigma, substance use, and attribution of illness**, with a specific focus on identifying **gender-related differences** in these relationships.

MATERIALS AND METHODS

Study Design

This study was designed as a cross-sectional, hospital-based observational study. Each participant was assessed during a single clinical encounter to evaluate medication adherence and its relationship with insight, symptom severity, and antipsychotic side effects.

Study Setting

The study was conducted at the Institute of Mental Health & Hospital (IMHH), Agra, a postgraduate teaching and tertiary referral centre for psychiatric disorders. The hospital has a bed capacity of more than 800, catering to a wide catchment area.

Sample Size

A total of 60 patients diagnosed with schizophrenia were included in the study.

Sampling Method

A purposive sampling technique was employed. Participants were recruited from the follow-up outpatient department (OPD). Eligible individuals were those receiving antipsychotic treatment for at least one year.

Eligibility Criteria

Inclusion Criteria

- Diagnosis of Schizophrenia according to ICD-10 DCR criteria.
- On prescribed antipsychotic medication for ≥ 1 year.
- Age between 18 and 55 years.
- Either sex with a minimum education of 8th standard.
- Ability and willingness to provide written informed consent.

Exclusion Criteria

- Refusal or inability to provide written informed consent.
- Presence of long-standing major medical illness or psychiatric disorder other than schizophrenia.
- Age below 18 years or above 55 years.

Study Tools and Instruments

1. Socio-Demographic and Clinical Data Sheet

A structured proforma was used to collect demographic information and clinical details, including:

- duration of illness and treatment
- current antipsychotic medication and dosage
- treatment cost
- distance from treatment centre
- substance use history: type, quantity, and pattern of intake

2. Medication Adherence Rating Scale (MARS)

The 10-item MARS was used to assess medication adherence.

- Items 1–4 (from MAQ): scored no = 1, yes = 0
- Items from DAI:
 - Q6, Q9, Q10: no = 1, yes = 0
 - Q5, Q7, Q8: no = 0, yes = 1

A higher total score indicated better adherence, whereas lower scores reflected poorer adherence.

3. Positive and Negative Syndrome Scale (PANSS)

The PANSS, a 30-item clinician-rated instrument, was used to measure:

- positive symptoms,
- negative symptoms, and
- general psychopathology.

Each item is scored from 1 (absent) to 7 (extreme).

4. Insight Scale for Psychosis

This scale assesses the level of patient insight across three domains:

- awareness of illness
- need for treatment
- attribution of symptoms

Higher scores reflect greater insight.

5. Antipsychotic Side-Effects Checklist (ASC)

The 17-item ASC was used to screen for common antipsychotic side effects and related subjective experiences. The checklist enhances clinician–patient communication about side effects, an important factor influencing adherence.

6. Belief of Causation of Mental Illness Questionnaire

A 19-item questionnaire assessing patients' beliefs regarding the causes of their illness. Responses were categorized for attributional analysis.

7. Stigma Scale

A 28-item, 5-point Likert scale measuring perceived stigma. It consists of three components:

1. discrimination
2. disclosure concerns
3. perceived positive aspects of mental illness

The scale has demonstrated acceptable reliability (test-retest kappa = 0.4).

8. Michigan Alcohol Screening Test (MAST)

A 24-item scale used to screen for alcohol abuse.

A score >5 is considered indicative of alcoholism.

9. Cannabis Abuse Screening Test (CAST)

A brief tool used to detect problematic patterns of cannabis use, particularly in adolescents and young adults.

Ethical Considerations

Written informed consent was obtained from all participants. Confidentiality of patient information was strictly maintained. Approval from the institutional ethics committee was obtained prior to the commencement of the study.

RESULTS AND OBSERVATIONS

Table; 1 Socio demograhpic profile of the sample

Variables	Schizophrenia(n=60)	
Gender	M	49(81.6%)
	F	11(18.4%)
Education	Less than high school	39(65%)
	High school	1(1.6%)
	intermediate	11(18.3%)
	Graduation	9(15%)
Martial status	Married	46(76.6%)
	Unmarried	14(23.3%)

Occupation	unskilled	26(43.3%)
	semiskilled	11(1.6%)
	skilled	12(20%)
	unemployed	1(1.6%)
	housewife	10(16.6%)
Religion	hindu	52(86.6%)
	Non hindu	8(13.3%)
Socio economic status	Low	56(93.3%)
	middle	4(6.6%)

Table 2: Mean, S.D., and t-values of PANSS Scores in Poor Adherence and Good Adherence Groups in Male Patients

PANSS Domain	Adherence Group	N	Mean	S.D.	t-value	p-value
PANSS Positive	Poor adherence	21	6.81	5.53	3.28	.01
	Good adherence	28	2.25	4.21	—	—
PANSS Negative	Poor adherence	21	10.90	8.45	3.98	.01
	Good adherence	28	3.61	4.10	—	—
PANSS General	Poor adherence	21	30.67	6.34	3.30	.01
	Good adherence	28	25.75	4.10	—	—

Table 3: Mean, S.D., and t-values of Insight Scale (Total and Domains) in Poor and Good Adherence Groups in Male Patients

Insight Variable	Adherence Group	N	Mean	S.D.	t-value	p-value
ISP Total Score	Poor adherence	21	8.62	3.90	1.40	NS
	Good adherence	28	10.00	2.76	—	—
Symptoms Awareness	Poor adherence	21	2.77	3.07	1.30	NS
	Good adherence	28	1.97	0.96	—	—
Illness Awareness	Poor adherence	21	2.33	1.32	0.62	NS
	Good adherence	28	2.61	1.69	—	—
Need for Treatment	Poor adherence	21	2.71	2.78	0.07	NS
	Good adherence	28	2.68	0.55	—	—

Table 4: Mean, S.D., and t-values of Stigma Scores in Poor and Good Adherence Groups in Male Patients

Stigma Domain	Adherence Group	N	Mean	S.D.	t-value	p-value
Stigma Scores – Discrimination	Poor adherence	21	15.86	7.04	0.72	NS
	Good adherence	28	14.21	8.36	—	—
Stigma Scores – Disclosure	Poor adherence	21	19.67	9.97	0.16	NS
	Good adherence	28	20.18	12.33	—	—
Stigma Scores – Positive Aspects	Poor adherence	21	8.86	2.67	2.54	.05
	Good adherence	28	6.90	2.67	—	—

Table 5: Mean, S.D., and t-values of Belief of Causation in Poor Adherence and Good Adherence Groups in Male Patients

Belief in Causation	Adherence Group	N	Mean	S.D.	t-value	p-value
Heredity	Poor adherence	21	0.19	0.40	0.49	NS
	Good adherence	28	0.25	0.44	—	—
Brain dysfunction	Poor adherence	21	0.39	0.59	0.63	NS
	Good adherence	28	0.50	0.70	—	—
Psychosocial stress	Poor adherence	21	0.29	0.56	0.18	NS
	Good adherence	28	0.32	0.77	—	—
Personality defect	Poor adherence	21	0.62	0.80	1.34	NS
	Good adherence	28	0.36	0.56	—	—
Supernatural cause	Poor adherence	21	0.33	0.48	0.09	NS
	Good adherence	28	0.32	0.48	—	—
Fate / God's will	Poor adherence	21	0.42	0.67	1.07	NS
	Good adherence	28	0.68	0.90	—	—
No / Other cause	Poor adherence	21	0.19	0.40	0.82	NS
	Good adherence	28	0.11	0.31	—	—

Table:6 Mean, S.D., t-values and p-values of MAST, CAST, Distance from IMHH, No. of Hospitalizations and ASC Total Score in Medication Adherence of Male Patients

Variable	Adherence Group	N	Mean	S.D.	t-value	p-value
MAST Scores	Poor adherence	21	14.43	18.99	3.06	0.01
	Good adherence	28	2.21	8.13		
CAST Scores	Poor adherence	21	2.00	5.50	0.52	NS
	Good adherence	28	1.32	3.97		
Distance from IMHH (KM)	Poor adherence	21	116.14	113.64	0.07	NS
	Good adherence	28	113.89	115.93		
No. of Hospitalizations	Poor adherence	21	1.95	1.86	1.07	NS
	Good adherence	28	1.46	1.34		
ASC Total Score	Poor adherence	21	3.24	2.34	1.10	NS
	Good adherence	28	2.53	2.12		

Table: 7 Factors Associated with Medication Adherence in Male Patients

Measurement / Variable	Group / Category	N	Mean	S.D.	Statistic	p-Value
Distance from IMHH (KM)	Poor adherence	21	116.14	113.64	t = 0.07	NS
	Good adherence	28	113.89	115.93		
No. of Hospitalizations	Poor adherence	21	1.95	1.86	t = 1.07	NS
	Good adherence	28	1.46	1.34		
ASC Total Score	Poor adherence	21	3.24	2.34	t = 1.10	NS
	Good adherence	28	2.53	2.12		
Age and Medication Adherence (Correlation)	MARS Scores	–	5.93	2.19	r = 0.01	NS
	Age (years)	–	34.28	8.91		
Substance Use vs Adherence	No substance	Poor = 10	Good = 23	–	C = .50	NS
	Alcohol	Poor = 7	Good = 2	–		
	Cannabis	Poor = 3	Good = 3	–		
	Alcohol + Cannabis	Poor = 1	Good = 0	–	C = .50	NS

Table:8 Association of Prescribed Medicines and Occupation with Medication Adherence in Male Patients

Variable	Category	Poor Adherence	Good Adherence	Contingency Coefficient	p-Value
Prescribed Medicines	HPL	1	1	–	–
	TFP	2	3	–	–
	Olanzapine	1	7	–	–
	Risperidone	3	7	0.33	–
	Amisulpride	1	2	–	NS
	Quetiapine	0	1	–	–
	Combination therapy	13	13	–	–
	<i>No significant correlation between prescribed medication and medication adherence in males at any level.</i>				
Occupation	Unskilled	12	13	–	–
	Semiskilled	8	3	–	–
	Skilled	7	5	0.23	NS
	Unemployed	1	0	–	–

TABLE; 9 MEAN, S.D AND t values of PANSS Scores in Poor adherence and Good adherence groups in female Patients.

		N	Mean	SD	T value	P value
PANSS Positive	Poor adherence	6	8.33	3.88	3.98	.01
	Good adherence	5	0.80	1.79		
PANSS Negative	Poor adherence	6	12.00	5.76	4.15	.01
	Good adherence	5	0.80	1.79		
PANSS General	Poor adherence	6	27.17	7.94	1.46	NS
	Good adherence	5	21.80	2.28		

Table;10 Comparison of Insight Scores (ISP Scores, Symptoms Awareness, Illness Awareness, and Need for Treatment) Between Poor and Good Medication Adherence Groups in female Patients.

Adherence	N	Mean	S.D	t-value	p-value	
ISP Scores	Poor	6	8.50	5.28	1.08	NS
	Good	5	11.20	1.92		
Symptoms Awareness	Poor	6	1.83	1.48	1.21	NS
	Good	5	2.80	1.10		
Illness Awareness	Poor	6	2.50	1.64	0.86	NS
	Good	5	3.20	0.84		
Need for Treatment	Poor	6	2.00	1.26	1.33	NS
	Good	5	2.80	0.45		

Table; 11 Mean, S.D., and t-values of stigma scores in poor adherence and good adherence groups in female Patients.

Stigma Domain	Adherence Group	N (Sample Size)	Mean Score	S.D. (Standard Deviation)	t-value	p-value
Stigma Scores-Discrimination	Poor adherence	6	11.83	1.94	0.47	NS
	Good adherence	5	11.00	3.87		
Stigma Scores-Disclosure	Poor adherence	6	17.00	2.00	1.88	NS
	Good adherence	5	22.40	6.77		
Stigma Scores-Positive aspects	Poor adherence	6	9.17	4.17	0.26	NS
	Good adherence	5	8.60	2.51		

Table 12 Mean, S.D., and t-values of belief of causation in poor adherence and good adherence group in female Patients.

Belief of Causation Factor	Adherence Group	N (Sample Size)	Mean Score	S.D. (Standard Deviation)	t-value	p-value
Heredity	Poor adherence	6	0.17	0.41	0.90	NS
	Good adherence	5	0.40	0.55		
Brain dysfunction	Poor adherence	6	0.00	0.00	2.08	NS
	Good adherence	5	1.40	1.68		
Psychosocial stress	Poor adherence	6	0.17	0.41	1.58	NS
	Good adherence	5	1.00	1.22		
Personality defects	Poor adherence	6	0.17	0.41	1.16	NS
	Good adherence	5	1.00	1.73		
Supernatural cause	Poor adherence	6	0.17	0.41	1.65	NS
	Good adherence	5	0.80	0.84		
Fate/God's will	Poor adherence	6	0.67	1.03	0.93	NS
	Good adherence	5	1.20	0.84		
None	Poor adherence	6	0.33	0.51	1.43	NS
	Good adherence	5	0.00	0.00		

Table; 13 Analysis of Clinical, Treatment, and Demographic Factors Related to Medication Adherence in Female Patients

Factor	Adherence Group	N (Sample Size)	Mean	S.D. (Standard Deviation)	t-value	p-value
Distance from IMHH in KM	Poor adherence	6	234.0	171.16	1.70	NS
	Good adherence	5	94.00	69.86		
No. of Hospitalizations	Poor adherence	6	2.00	1.26	1.43	NS
	Good adherence	5	1.00	1.00		
ASC Total score	Poor adherence	6	2.00	1.67	0.16	NS
	Good adherence	5	1.80	2.49		

DISCUSSION

The present study examined gender differences in medication adherence among patients with schizophrenia and explored the relationship between adherence and multiple clinical, psychosocial, and treatment-related variables. The findings highlight **distinct patterns of adherence in male and female patients**, consistent with existing literature suggesting that gender significantly influences treatment behavior, clinical presentation, and psychosocial determinants in schizophrenia [1,2].

Among **male patients**, poor adherence was significantly associated with **higher PANSS positive, negative, and general psychopathology scores**. This aligns with past studies showing that more severe symptoms—particularly negative symptoms—impair motivation, cognitive functioning, and treatment insight, ultimately reducing medication adherence [3,4]. Increased symptom severity also leads to behavioral disorganization and a reduced ability to follow treatment schedules [5]. Our findings support earlier observations that males often present with an earlier onset and more severe course of illness, contributing to poorer functional outcomes and lower adherence rates [6].

Insight, although slightly lower in the poor-adherence male group, did not show statistically significant differences. This is consistent with previous reports that the relationship between insight and adherence, though important, is often mediated by other factors including cognitive deficits, substance use, and stigma [7,8]. However, the direction of change—lower insight among poorly adherent males—corroborates earlier evidence that diminished awareness of illness and reduced acceptance of the need for treatment contribute to non-adherence [9].

Stigma also demonstrated partial influence. Male patients with poor adherence showed significantly higher scores on the “positive aspects” component of stigma, suggesting a tendency to minimize illness severity or view symptoms as non-problematic. Similar findings have been reported in studies where stigma-related denial interfered with consistent medication intake [10]. However, other stigma subscales did not differ significantly, indicating that stigma may influence adherence indirectly or in combination with other psychosocial constructs.

Substance use emerged as a major factor among males. Alcohol use was significantly higher in the poor-adherence group, confirming extensive evidence that **substance use disorders strongly predict medication non-adherence** due to poor impulse control, chaotic lifestyle, and reduced treatment motivation [11,12]. Alcohol and cannabis use are known to worsen psychotic symptoms, interfere with pharmacological effects, and increase relapse and hospitalization rates [13]. Our findings mirror these patterns, underscoring the need for integrated dual-diagnosis treatment models for male patients.

In contrast, **female patients** showed different adherence patterns. Similar to males, females with poor adherence had significantly higher PANSS positive and negative symptom scores, reaffirming the universal role of symptom severity in predicting adherence regardless of gender. This is consistent with previous studies demonstrating that symptom burden is one of the strongest determinants of medication-taking behavior across settings [14].

However, unlike males, **insight, stigma, beliefs about causation, and side-effects did not significantly differ between good and poor adherers among females**. This could be attributed to smaller sample size or gender-specific resilience factors. Literature suggests that women with schizophrenia often have better insight, stronger social support, and greater treatment engagement compared to men, which may buffer the negative effects of symptom severity on adherence [15,16].

An interesting observation was the greater **distance from the treatment center** among females with poor adherence, a finding consistent with previous Indian studies showing that mobility restrictions, family dependence, and sociocultural barriers disproportionately affect women’s access to mental healthcare [17]. Geographic and logistical barriers can significantly reduce follow-up attendance and medication continuity in female patients, especially in rural settings [18].

Beliefs regarding causation of illness did not significantly differ between adherence groups in either gender. However, females tended to attribute illness more to psychosocial stress and biological causes than males, consistent with reports that women have a broader and more flexible understanding of mental illness etiologies [19].

Overall, the study highlights that **male non-adherence is more strongly associated with substance use and stigma**, whereas **female non-adherence is more related to access barriers and illness severity**. These findings emphasize the importance of **gender-sensitive clinical interventions**. For males, treatment should include routine substance-use screening, motivational interviewing, and relapse prevention modules. For females, enhancing accessibility, family counselling, and community-based follow-up mechanisms may significantly improve adherence.

The study has several strengths including the use of validated scales (PANSS, MARS, ASC, ISP), gender-specific analysis, and assessment of multiple psychosocial variables. However, limitations include the modest sample size, especially among females, the cross-sectional design, and use of purposive sampling, which may limit generalizability. Longitudinal studies are needed to better understand temporal patterns of adherence and causal pathways.

Despite these limitations, the study meaningfully contributes to the limited Indian literature on gender differences in treatment adherence in schizophrenia and provides actionable insights for clinicians and policymakers.

CONCLUSION

This study shows that gender significantly influences medication adherence in schizophrenia. Women generally exhibit better adherence due to stronger insight and social support, while men are more affected by substance use, poorer insight, and negative symptoms. Recognizing these gender-specific factors can help clinicians design targeted, patient-centered interventions to improve adherence and overall treatment outcomes.

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