

Original Research Article


# A cross sectional study on Medication adherence during the covid pandemic in patients with schizophrenia

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## Abstract

**Background:** Around 2/3<sup>rd</sup> of patients with schizophrenia do not receive long-term appropriate treatment and have 2-3 times higher risk of early death. There are several factors which affects medication adherence especially during covid period. Our aim was to estimate the prevalence and factors affecting medication non-adherence in patients with schizophrenia during the period of covid pandemic.

**Materials and methods:** It was a cross-sectional observational study done in 82 patients with schizophrenia. Socio-demographic and clinical details were collected. Details pertaining to medication non-adherence during covid were collected using semi-structured proforma. Medication adherence was assessed using Morisky Medication Adherence Scale 4 (MMAS 4) and treatment compliance in last 6 months was collected from patient case records.

**Results:** Our study showed 63% patients with medication non-adherence. Patients from semi-urban and rural background, with residence far from psychiatric facility and non-availability of transport were found to be at more risk of developing medication non-adherence, which were considered as economical factors related to non-adherence.

**Conclusion:** 63% of patients had increased medication non-adherence during covid period. Our findings underline the fact that treatment non-adherence maybe further affected by economy related factors during covid period.

## Key words

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Medication Adherence, Covid 19, Schizophrenia.

## Introduction

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Schizophrenia is a chronic and severe mental disorder which, according to WHO estimates, affects approximately 24 million people worldwide [1]. Effective management of schizophrenia requires continuous long-term treatment with antipsychotics in order to maintain symptoms under control and to prevent relapse [2]. 69% of people with schizophrenia are not receiving appropriate long-term appropriate treatment and have early deaths 2-3 times more likely compared to general population [3]. Medication adherence is defined by the WHO as "the degree to which a person's behavior corresponds with the agreed recommendations from a health care provider" [4]. Despite the critical importance of medication, non-adherence has been recognized as a problem worldwide and as the most challenging aspect of treating patients with schizophrenia [5]. Data from the Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) study showed that 74% of patients had discontinued medication within 18 months due to various reasons [6]. General factors affecting adherence are male gender, extremes of ages, unemployment, lower socioeconomic status, substance abuse, previous history of non-adherence, severity of illness, negative symptoms, cognitive symptoms, impaired insight, side effects, complex treatment schedule, stigma about mental illness, patient's different belief system about the cause of illness such as witchcraft or stressful life situation & family support [7, 8]. Non-adherence results in increased rate of repeated admissions, longer hospital stay, higher risk of suicide, slower recovery, emotional and financial burden, poorer prognosis, low satisfaction with life [9].

The covid-19 has spread across the globe in a short time and affected people's life, especially patients with severe mental disorders. Current evidence suggests that people with schizophrenia

may have an increased risk of mortality and morbidity from covid-19, although the underlying mechanisms are unclear. This can be contributed to the psychological distress and fear due to prevailing pandemic period which can be normal reaction to such a critical situation but for people with pre-existing mental health disorders are less likely to use coping mechanism to relieve from stress which can worsen their existing illness and can lead to relapse [10, 11]. Covid 19 has also impacted medication adherence in a negative way due to the restrictive measures that was implicated which made access to healthcare difficult and can further add on the risk for relapse. Hence, factors that were affecting medication non-adherence needs to be addressed so that it can be considered in the future pandemics or even in general situation to enhance medication adherence as it is considered as state of concern by World Health Organization [5].

## Materials and methods

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This cross-sectional observational study was conducted at a tertiary health care centre in Tamil Nadu over a period of 6 months after approval from the institutional human ethical committee. Patients visited psychiatry outpatient department, aged 18 to 59 years diagnosed with schizophrenia according to ICD-10 criteria (F20), who gave written informed consent, were included in the study. All subjects with other comorbid psychiatric disorders, medical comorbidities were excluded from the study. Assuming the proportion of medication non-adherence as 52%, sample size was calculated as 82.

## Instruments used

All samples with schizophrenia were diagnosed according to the international classification of diseases (ICD) DCR – 10<sup>th</sup> edition (F20). Socio-demographic, clinical details were collected from participants those who gave informed consent. A

semi-structured questionnaire was used to collect details pertaining to medication non-adherence like availability of nearby psychiatric facility, availability of transport, availability of online drug delivery, fear of contracting covid, caretaker contracted with covid, loss of job or lesser income comparatively during pandemic period. Treatment compliance in last 6 months and missing follow-up if any was collected from individual case records.

### **SCAN (Schedule for Clinical Assessment in Neuropsychiatry)**

It is a semi-structured clinical interview to assess and diagnose psychiatric disorder. It can be used both for ICD-10 and DSM systems. This was a modification of Present State Examination and was applied to rule out the presence of any comorbid psychiatric illness.

### **Morisky Medication Adherence Scale-4 (MMAS-4)**

It is a self-reported scale to assess the medication taking behavior. It is a four-item questionnaire developed by Morisky, Green and Levine in 1986. It has a scoring scheme of YES = 0 and NO = 1. The items are summed to give a range of scores from 0 to 4. A score of 0-1 indicates poor adherence and 2-4 indicates good adherence.

### **Statistical analysis**

Statistical analysis was done using statistical package for the social sciences (SPSS) software v.21. Descriptive statistics was used to analyze the characteristics of study population i.e., socio-demographic variables, clinical and treatment compliance related variables. Chi square test was used to compare the characteristics of study population between the treatment adherent and treatment non adherent group. Logistic regression was used to assess the factors affecting medication adherence among study population. For all statistical tests, *P* value significance was set at <0.05.

## **Results**

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The mean age of study population was 32.45. The proportion of male and female are almost same with males being slightly higher. 1/3<sup>rd</sup> of participants is illiterate and the other 1/3<sup>rd</sup> had pursued at least high school education. Most of them are semi-skilled workers (53.7%) belonging to lower socioeconomic status (69.5%), married (65.8%) and from semiurban and rural areas (64.6%). Almost all participants belong to nuclear families. Most of them had their age of onset of illness in 4<sup>th</sup> decade (30-39 years) (39.1%) with a duration of illness of 2-4 years (37.8%) with more than half of participants had a positive family history of psychiatric illness. Majority did not have a nearby psychiatry facility (62.2%) with unavailability of transport (63.5%). Majority (58%) was non-compliant to medications in last 6months (**Table - 1**).

Participants were assessed for medication adherence using MMAS-4 and 61% were found to be poorly adherent to medications (**Figure - 1**). On comparing the socio-demographic variables between the treatment adherent and non-adherent group, difference was found to be statistically significant with respect to occupation ( $P<0.01$ ) and place of residence ( $P=0.03$ ) (**Table - 2**). On assessing the relationship between Clinical and Treatment related variables and two groups, statistically significant difference was found with respect to age of onset of illness ( $P=0.02$ ), duration of illness ( $P=0.04$ ), distance of nearby psychiatric facility ( $P=0.02$ ) and availability of transport ( $P=0.01$ ) (**Table - 3**). After applying logistic regression, medication adherence found to be significantly associated with place of residence ( $P=0.04$ ), distance of nearby psychiatric facility ( $P=0.02$ ) and availability of transport ( $P=0.02$ ) (**Table - 4**).

## **Discussion**

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The aim of our study was to estimate the prevalence of medication adherence and factors related to it during period of covid pandemic. In our Indian setup, females are generally expected to be highly functional in-terms of society and communal behavior which in turn might be a

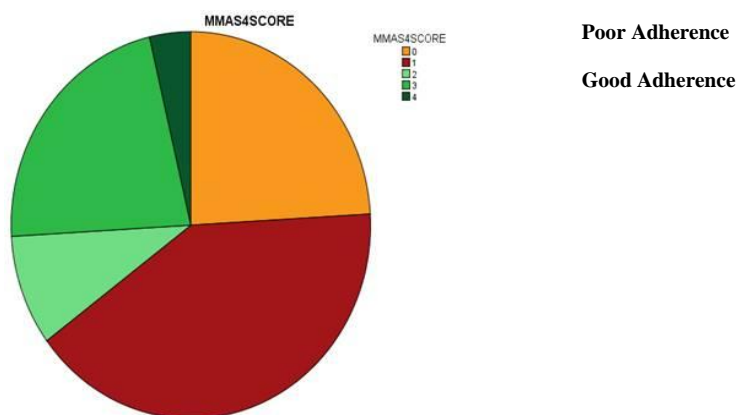
reason for compliance and medication adherence and several studies are in line with this finding [12, 13] including our study which has shown poor medication adherence more in male in comparison to female.

**Table – 1:** Characteristics of Socio-demographic, Clinical and Treatment related variables in study population (n=82).

<b>Socio-demographic variables</b>	<b>Frequency (n)</b>	<b>(%)</b>
<b>Age at presentation (years)</b>	32.45±5.34	-
<b>Sex</b>		
Females	37	45.1
Males	45	54.9
<b>Education</b>		
Graduate	11	13.4
High school	24	29.2
Middle school	11	13.4
Primary school	13	15.9
Illiterate	23	28.1
<b>Occupation</b>		
Semi-skilled worker	44	53.7
Un-skilled worker	13	15.9
Unemployed	25	30.4
<b>Socio-economic status</b>		
Lower middle	13	15.9
Upper lower	57	69.5
Lower	12	14.6
<b>Marital status</b>		
Married	54	65.8
Umarried	28	34.2
<b>Type of family</b>		
Nuclear	80	97.5
Joint	2	2.5
<b>Place of residence</b>		
Urban	29	35.4
Semi-urban & Rural	53	64.6
<b>Clinical variables</b>	<b>Frequency (n)</b>	<b>(%)</b>
<b>Age of onset of illness (years)</b>		
18-29	13	15.9
30-39	32	39.1
40-49	25	30.4
50-59	12	14.6
<b>Duration of illness in month</b>		
0-24	29	35.4
25-48	31	37.8
49-72	12	14.6
73-96	10	12.2
<b>Family history of Psychiatric illness</b>		
Yes	46	56

No	36	44
<b>Treatment compliance related variables</b>	<b>Frequency (n)</b>	<b>(%)</b>
Distance of nearby psychiatry facility		
Near	31	37.8
Far	51	62.2
<b>Availability of transport</b>		
Yes	30	36.5
No	52	63.5
<b>Treatment compliance (last 6 months)</b>		
Yes	34	41.4
No	48	58.6
<b>Variables</b>	<b>Frequency</b>	<b>(%)</b>
<b>MMAS 4 Scoring</b>		
0	20	24.3
1	30	36.5
2	10	12.1
3	16	19.5
4	6	7.6
<b>MMAS 4 Scale</b>		
Good	32	39
Poor	50	61

**Figure – 1:** Distribution of Medication Adherence among the study population.



**Table – 2:** Comparison of socio-demographic factors between the treatment adherent and non-adherent group.

Variable	MMAS 4 scale		Total	Chi-square / Fisher's exact	P value
	Good	Poor			
<b>Sex</b>					
Female	18	19	37	2.00	0.15
Male	13	32	45		
<b>Education</b>				8.41	0.07
Graduate	4	7	11		
High school	15	9	24		
Middle school	2	9	11		
Primary school	6	7	13		

Illiterate	4	19	23		
<b>Occupation</b>					
Semi skilled	10	34	44	9.80	< 0.01*
Unskilled	3	10	13		
Unemployed	17	8	25		
<b>Marital status</b>					
Married	16	38	54	3.27	0.07
Unmarried	15	13	28		
<b>Socio-economic status</b>					
Lower middle	3	10	13	0.29	0.86
Upper lower	22	35	57		
Lower	4	8	12		
<b>Place of residence</b>					
Urban	17	12	29	4.69	0.03*
Semi urban, Rural	15	38	53		

**Table – 3:** Correlation of Clinical and Treatment compliance variables between the two groups (n=82).

Variable	MMAS SCALE		Total	Chi-square / Fisher's exact	P value
	Good	Poor			
<b>Age of onset of illness (years)</b>					
18-29	9	4	13	9.43	0.02
30-39	5	27	32		
40-49	12	13	25		
50-59	7	5	12		
<b>Duration of illness in months</b>					
0-24	16	13	29	8.31	0.04
25-48	5	26	31		
49-72	7	6	12		
73-96	4	6	10		
<b>Family history of Psychiatric illness</b>					
Yes	20	26	46	1.51	0.21
No	9	27	36		
<b>Distance of nearby psychiatry facility</b>					
Near	19	12	31	5.05	0.02
Far	10	41	51		
<b>Availability of transport</b>					
Yes	17	11	28	6.32	0.01
No	14	40	54		
<b>Treatment compliance (last 6 months)</b>					
Yes	12	22	34	0.08	0.76
No	16	32	48		

Educational qualification determines the level of income and access to resources which implies that individuals with lower educational

qualification are more prone to be non-adherent to medication which is a finding in few studies [14 15] and is in line with our study. Lower

educational qualification can also restrict the knowledge about online consultation or telepsychiatry which was prevailing as the main source to access psychiatric care which can add on to medication non adherence during pandemic like covid period. Limited available psychiatry setup mandates the individuals from semiurban and rural areas to travel to get the necessary care which can add on the cost of treatment and contribute to medication non-adherence [16]. Our study also showed similar finding where individuals with their residence from semiurban

and rural places showed poor adherence and covid pandemic period has added further disadvantage due to restriction in travel, limited transport availability and unavailability of access to online drug delivery. In an Indian study [9], it was observed that male sex, lower educational qualification and residence are associated with poor adherence which is in line with our study. Same study also showed that unmarried status, joint family status and family history are associated with poor adherence [9].

**Table – 4:** Factors affecting Medication Adherence in study population.

Factors related	Total no. of poor adherers	Odds ratio (or)	95% confidence interval		P value	Corrected P value
			Lower	Upper		
<b>Place of residence</b>						
Urban	12	4.56	1.033	20.180	0.01	0.04
Semi urban, Rural	38					
<b>Distance of nearby psychiatry facility</b>						
Near	12	4.99	1.203	20.722	0.01	0.02
Far	41					
<b>Availability of transport</b>						
Yes	11	5.15	1.213	21.868	< 0.01	0.02
No	40					

Our study did not show poor adherence in terms of marital status, family type and family history. This could have been due to poor quality of marital relationship per se. As all our participants belong to nuclear family type, we were not able to find a significant difference based on family type. In our study, no statistically significant difference noticed in socioeconomic status of those who were adherent and non-adherent to medications which was in contrast with previous study [17] (non-adherers associated with low socioeconomic status). This may be because most of our study population consisted of low socioeconomic status (90%).

In an Indian study done during pre-covid period by Bushan Choudari, et al., the rate of medication non adherence in schizophrenic patients were reported to be 54% [18] whereas,

our study has shown 61% non-adherence, which shows that the rate has increased during period of covid pandemic. In our study, we found that patients age belonging to 4<sup>th</sup> decade had more non adherence to medication which is in contrast with other studies [13, 18, 19] and also, we found that patients with 2-4 years total duration of illness had more non adherence to medication.

Patients of the age group 30-39 years mostly would have been the main source of family income with financial and emotional responsibility towards all other family members especially during a crucial period like covid pandemic, which might have led them to pay less attention to their own health needs thereby rendering themselves non-adherent. With increasing age, patients may accumulate experience about the illness course and necessity



of treatment to remain symptom-free and prevent relapse which may improve adherence with age [18].

In a study done in Japan [20], it was suggested that medication adherence is good within the first year of start of treatment but worsens over the subsequent 1–5 years, after which again the adherence starts improving. After first year the next four years are said to be the critical period for medication adherence, which is in line with our current study finding. Being regular to follow-up in last 6 months according to records did not have significant difference between those adherent to medication or not. The restrictive measures during period of covid pandemic has led to decrease in jobs opportunities and less income, as well as less access to mental health services and difficult to obtain antipsychotic medicine. Patients from Semi urban and rural, residence far from psychiatric facility and non-availability of transport were found to be at more risk of developing medication adherence which were considered as economic factors related to non-adherence in previous studies whereas other factors did not show any statistically significant difference.

Even though our study has shown increased number of individuals in poor adherence in each category, no significant difference between the adherent and non-adherent group in these categories implies that rather than these general factors, economy related factors act as a superadded disadvantage during pandemic period like covid. Increased financial burden all over India due to covid has increased the risk for non-adherence. During covid period along with restrictive measures, many developing countries also made hard decisions like mobilization of health personnel to the frontline management of covid 19 infection due to limited availability. This had an impact on individuals with chronic disease like mental health illness which necessitates frequent visits and prescription refills since their access to their regular physician would have been difficult and as psychotropics are not over the counter medications which needs

physician prescription would have contributed to medication non-adherence [21].

The uncertainty regarding the information on effect of covid 19, its treatment and prognosis as lot of unconfirmed information was given by some media outlets has raised concern of being infected due to hospital visits has forced many patients to avoid visiting hospitals in spite of their deteriorating health condition [22]. Caregivers of patients with Schizophrenia mainly serve as a support system for daily living and a liaison for their medical care like ensuring regular intake of medication, scheduling appointments and providing transport for hospital visits. So, caretakers who contracted covid would have not been able to provide their regular care for patients which could be contributed to medication non adherence during this pandemic period.

Along with preventive techniques that were used to prevent the spread like campaign and video messages in social media and voice messages during phone calls, the same mode could have used to create awareness regarding teleconsultation, stigma in regard to hospital visits during covid period and the available facilities to access health care during pandemic period which would have prevented the increase in medication non-adherence and associated deterioration of illness [23].

This study is one of few studies which has attempted to explore the importance of medication adherence during a pandemic. Our study has also additionally emphasized on the role of economic factors in medication adherence especially during a crisis period like covid pandemic, addressing which can increase medication adherence and prevent further relapse. However, our study was limited by smaller sample size, hence generalization to the whole population cannot be done. Also, we attempted to assess medication adherence during covid period only in patients with schizophrenia and it would be worthwhile to assess its burden in other mental health illness as well in future.



## Conclusion

Almost 2/3rd (63%) of patients had medication non adherence during period of covid pandemic in our study. Our findings underline the fact that the treatment non-adherence is further affected in a major proportion of patients during covid pandemic period, and hence, it is of major concern for the successful prevention of relapse of schizophrenic symptoms. Economy related factors like place of residence (semi urban and rural), more distance from nearby psychiatric facility and non-availability of transport played a major role. Increasing awareness regarding telepsychiatry should be created to reduce unnecessary disease worsening, to prevent unwanted delay in titration of medications and additional medical costs, thereby causing deterioration in quality of life. The idea of addressing these factors during any pandemic should be emphasized.

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