Original Research Article

Study of Drug Compliance and Its Influencing Factors in Schizophrenic Patients

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ABSTRACT

The aim was to study drug compliance & to identify factors influencing with compliance in schizophrenic patients. 70 subjects (consecutive sampling) meeting the inclusion criteria were included and details were collected in the Structured Socio demographic Proforma. The MARS scale was administered first followed by ROMI and PANSS scales. Risk factors affecting compliance were analysed using Chi-square (χ^2) test. Independent t-test was performed to assess severity of illness by comparing MARS scores & ROMI scores with the PANSS scores. The results of the study showed that 56% were compliant & 44% were noncompliant. Majorities were belonged to the female gender & the compliance rate was higher among the females (54%). The level of significance was taken at $p<0.05$. Substance abuse was a strong predictor of non-compliance. Statistically, significant association was found between substance abuse and compliance ($p<0.05$). Highly statistical significant association was found in both Reasons for compliance ($p<0.0001$) & noncompliance questions ($p<0.05$) under ROMI scale. There was a statistically significant association between drug compliance and its influencing factors. Clinicians should maintain a positive relationship with patients to counsel them about drug compliance & to reduce the burden and chronicity of schizophrenia.

Key words: Adherence, Compliance, Schizophrenia, Severity of illness, Sociodemographic factors.

INTRODUCTION

Schizophrenia is a mental disorder that is characterized by disturbances in thoughts (delusions), perception (hallucinations), and behavior (such as disorganized speech or catatonic behaviour) and by noticeable deterioration in the level of functioning in everyday life. Schizophrenic disorders generally begin in the late teenage years or early adulthood and tend to occur in withdrawn, seclusive individuals. The lifetime prevalence worldwide has been estimated to be just under 1%, and the disorder affects 1.5 to 2 million people in the United States alone. [1]

The primary form of treatment of schizophrenia is antipsychotic medication. Antipsychotic drugs help to control almost all the positive symptoms of the disorder. They have minimal effects on disorganized behavior and negative symptoms. Antipsychotic medications reduce the severity of serious mental illness (SMI) and improves patients outcomes only when medicines were taken as prescribed. [2] Compliance to medication usually means the extent to which the patient takes the medication as prescribed. [3] Medication noncompliance is one of the main obstacles to control relapse in schizophrenia. Patients

with schizophrenia are particularly vulnerable to relapse following medication non-compliance. [4] The current study has tried to assess the attitudes and reasons for drug compliance as well as noncompliance among patients with schizophrenia to the scheduled out-patient visits at a major psychiatric teaching hospital.

MATERIALS AND METHODS

1. **Study site, Study design and Ethical Considerations:** The present study was carried out in the Psychiatry out- patient department, Government General Hospital, Kakinada with a sample size of 70 patients for the duration of six months. It was an cross-sectional Observational Study and a Consecutive Probability sampling technique was used. The Institutional ethical committee approved our study. It doesn't involve any administration of drugs to humans or animals as there is no collection of specimen or serum samples.

2. **Participants**

Inclusive criteria –
1. Patients diagnosed with Schizophrenia.
2. Patients with age ≥18 years and more.

Exclusive criteria –
1. Patients who are not willing to cooperate.
2. Patients who are acutely ill, comorbidities, mental retardation, organicity, dementia and delirium have been excluded.

3. **Study instruments**
- MARS (Medication adherence rating scale), ROMI (Rating of medication influence scale) and PANSS (Positive and Negative syndrome scale) questionnaires were used in the present study. MARS is a 10- item self report measure of medication adherence. The total score ranges from 0-10(rated as 'Yes' or 'No'). A Score of ≥6 indicates adherence & <6 indicates non-adherence to the medication.
- ROMI is a reliable and valid instrument that can be used to assess the patients' subjective reasons for medication

compliance and non-compliance. It consists of 20 items (7 items-compliance, 13 items- non compliance) rated from 0-9. The medication compliance in ROMI scale was categorized into 3 types, as mild (0-7), moderate (8-14), strong (15-21) and in non-compliance scale as, mild (0-13), moderate (14-26), strong (27-39).
- PANSS is used for measuring symptom severity of patients with schizophrenia. The patient is rated from 1 to 7 on 30 different symptoms (7 items-positive, 7 items-negative, 16 items- general psychopathology). Score ranges are 7-49 for the Positive and Negative Scales and 16-112 for the General Psychopathology Scale. The symptom severity in PANSS scale was categorized into 5 types, as mildly ill (58-74), moderately ill (75-94), markedly ill (95-115), severely ill (≥ 116) and <58 was considered as remission.

4. **Data Collection and Analysis**

Schizophrenic patients who agreed and gave a written informed consent were then applied the inclusion and exclusion criteria and were enrolled into the study. Those patients who couldn't not give history and information, detailed history was taken from a reliable and adequate informant. Socio-demographic data like patients' age, gender, educational level, occupation, diagnosis, social history and medications prescribed will be noted down from case sheet of patient onto a self prepared semi-structured socio-demographic proforma. Patient's history was noted and this interview took approximately 20-30 mins during which patient's response was noted in research questionnaire.

For qualitative data like gender, educational level, employment status, marital status, social history etc., Chi-square test (χ^2) was applied. Risk factors affecting compliance were analysed. Frequency and percentages were calculated. Mean & standard deviation were calculated for quantitative data like Age and PANSS scores. Independent t-test was performed to

assess severity of illness by comparing MARS scores & ROMI scores with the PANSS scores. The level of significance was taken at p<0.05. A p-value of <0.0001 was considered as statistically highly significant.

RESULTS AND DISCUSSION

Table-1: Relationship between socio-demographic factors & Degree of Influence of compliance using ROMI Scale (N=70)

DOMAINS		ROMI (Degree of Influence)		χ^2 value	p value
		Compliance	Non Compliance		
Age	≤25 years	9(23.076%)	7(22.580%)	0.044	0.978
	26-50 years	22(56.410%)	17(54.838%)		
	≥51 years	8(20.512%)	7(22.580%)		
Gender	Male	18(46.153%)	15(48.387%)	0.034	0.852
	Female	21(53.846%)	16(51.612%)		
Educational Status	Uneducated	12(30.769%)	10(32.258%)	2.448	0.48
	Primary	7(17.948%)	10(32.258%)		
	Secondary	18(46.153%)	10(32.258%)		
	Degree	2(5.128%)	1(3.225%)		
Employment Status	Employed	13(33.333%)	10(32.258%)	0.009	0.924
	Unemployed	26(66.666%)	21(67.741%)		
Substance abuse	Yes	5(12.820%)	10(32.258%)	3.875	0.04*
	No	34(87.179%)	21(67.741%)		
Family support	Yes	38(97.435%)	28(90.322%)	1.622	0.202
	No	1(2.564%)	3(9.677%)		
Marital status	Single	16(41.025%)	9(29.032%)	7.46	0.05
	Married	16(41.025%)	17(54.838%)		
	Divorced/separated	2(5.128%)	5(16.129%)		
	Widowed	5(12.820%)	0		

p-value*(<0.05) is considered as significant association.

Table-2: Presence of adherence: (N= 70)

MARS	No. of Patients
Adherent	39 (55.714%)
Non-adherent	31 (44.285%)

Table 2 represents that out of 70 subjects, 56% were adherent & 44% were non-adherent.

Table-3: Strength of compliance: (N= 70)

ROMI	Moderate	Strong
Compliance	16 (41.025%)	23 (58.974%)
Non-compliance	25 (80.645%)	6 (19.354%)

(chi sq- 9.6; p-value-0.0019*)

Table 3 represents that among compliant subjects, 59% were strongly compliant whereas in noncompliant subjects, only 19% were strongly noncompliant in our study and it was found to be highly significant with p-value 0.001.

Table-4: Severity of illness in the sample: (N= 70)

PANSS	Remission	Mildly ill	Moderately ill	Markedly ill	Severely ill
No. of Patients	2 (2.86%)	18 (25.7%)	23 (32.86%)	15 (21.43%)	12 (17.14%)

Table-4 represents that majority of the subjects were moderately ill i.e. 33%, whereas only 3% of the sample were in remission and 26% of the sample were mildly ill while markedly ill were 21% and severely ill were 17%. Severity of illness was assessed by using PANSS scale in our study.

Table-5: Comparing the severity of illness in the Compliant and Non-compliant subjects using ROMI scale

ROMI	PANSS (No. Of subjects)				
	Remission	Mildly ill	Moderately ill	Markedly ill	Severely ill
Compliant	2(5.128%)	18(46.153%)	16(41.025%)	2(5.128%)	1(2.564%)
Non-Compliant	-	-	7(22.580%)	13(41.935%)	11(35.483%)

chi sq- 39.52 ; p-value - <0.0001*

Table 5 represents the severity of illness in compliant and non-compliant subjects. Compliant subjects were mostly mildly ill (46%) and moderately ill (41%). Non-compliant subjects were mostly markedly ill (42%) and severely ill (35%).

Results showed that severity of illness is directly proportional to non-compliant and inversely proportional to compliance in the sample and it was found to be highly significant (p<0.0001).

Table-6: Comparison of MARS scores & ROMI scores with PANSS scores

PANSS Scores	MARS scores		ROMI scores	
	t-statistics	p-value	t-statistics	p-value
	-30.3	<0.0001*	-25.47	<0.0001*

Table-6 showed that the comparison of MARS Score with PANSS Scores and ROMI Scores with PANSS Sores in all the subjects was done and it was found to be highly significant with p<0.0001.

Table-7: Represents Mean and Standard deviation of PANSS Scores in both Compliant and Non-compliant subjects

COMPLIANCE GROUPS	NUMBER OF SUBJECTS	PANSS SCORE	
		MEAN	STANDARAD DEVIATION
Compliance	39(55.714%)	76.69	15.50
Non-Compliance	31(44.285%)	110	18.18

Table 7 showed that the mean of the PANNS score in both compliant and non compliant subjects were found to be 76.69 and 110 whereas Standard deviation of the PANNS score in both compliant and non-compliant subjects was found to be 15.5 and 18.18 respectively.

Table-8: Various reasons of compliance using ROMI scale: Comparison (Total N=70)

REASONS FOR COMPLIANCE	DEGREE OF INFLUENCES (n=39)		
	MILD	MODERATE	STRONG
(1) perceived daily benefit	0	10(25.641%)	29(74.358%)
(2) positive relationship with clinician	1(2.564%)	21(53.846%)	17(43.589%)
(3) positive relationship with therapist	1(2.564%)	21(53.846%)	17(43.589%)
(4) positive family belief	1(2.564%)	11(28.205%)	27(69.230%)
(5) relapse prevention	1(2.564%)	20(51.282%)	18(46.153%)
(6) pressure or force to take medications	31(79.487%)	4(10.256%)	4(10.256%)
(7) fear of re-hospitalization	31(79.487%)	6(15.384%)	2(5.128%)

chi sq- 153.77 ; p-value – <0.0001*

Table 8 showed that highly statistical significant association was found in Reasons for compliance under ROMI Scale (P<0.0001).

Table-9: Various reasons of non-compliance using ROMI scale: Comparison

REASONS FOR NON-COMPLIANCE	DEGREE OF INFLUENCES (n=31)		
	MILD	MODERATE	STRONG
(1) no perceived daily benefit	9(29.032%)	16(51.612%)	6(19.354%)
(2) negative relationship with Clinician	4(12.903%)	21(67.741%)	6(19.354%)
(3) negative relationship with therapist	4(12.903%)	21(67.741%)	6(19.354%)
(4) practitioner opposed to medications	9(29.032%)	13(41.935%)	9(29.032%)
(5) family or friend opposed to medications	24(77.419%)	5(16.129%)	2(6.451%)
(6) problems with access to treatment	17(54.838%)	13(41.935%)	1(3.225%)
(7) embarrassment of stigma over the medications	12(38.709%)	13(41.935%)	6(19.354%)
(8) financial obstacles	16(51.612%)	11(35.483%)	4(12.903%)
(9) substance abuse	21(67.741%)	4(12.903%)	6(19.354%)
(10) denial of illness	14(45.161%)	8(25.806%)	9(29.032%)
(11) medication thought to be currently unnecessary	14(45.161%)	13(41.935%)	4(12.903%)
(12) distressed by side effects	12(38.709%)	15(48.387%)	4(12.903%)
(13) desire for re-hospitalization	14(45.161%)	16(51.612%)	1(3.225%)

chi sq- 16.46 ; p-value – 0.0025*

Table 9 showed that highly statistical significant association was found in Reasons for non-compliance under ROMI Scale (P=0.0025).

1) Age & Compliance:

In the ≤25 years age group, 23% were compliant whereas in the 26-50 years age group, 56.4% were compliant and in the ≥51 years age group, 20.5% were compliant. Thus, a majority of the compliant subjects were belonged to the age group of 26-50 years. Results of the current study showed that there is no significant relationship of age with compliance (p=0.98).

2) Gender & Compliance:

The compliance rate was higher among the females (54%) than in the males (46%). P-value was found to be 0.85 and therefore the difference between the groups was statistically not significant.

3) Level of Education & Compliance:

In the compliant group, 31% were uneducated, 18% were educated upto primary level, 46% upto secondary level and 5% were upto degree level. Thus, a majority of the compliant subjects were educated upto secondary level. Results showed that there is no significant relationship of educational status with compliance (p=0.48).

4) Employment status & Compliance:
Majority of the subjects in both the groups were unemployed. Among compliant subjects, 67% were unemployed and 33% were employed. Results showed that there is no significant relationship of occupation with compliance (p=0.92).

5) Substance abuse & Compliance:
Substance abuse was a strong predictor of non-compliance. Majority of the subjects in both groups were with no substance abuse. Among compliant subjects, 13% were with substance abuse and 87% were with no substance abuse. Results showed that there is a significant relationship of substance abuse with compliance (p=0.04).

6) Family support & Compliance:
Majority of the subjects in both the groups were with family support. Among compliant subjects, 97.5% were with family support & 2.5% were with no family support. Results showed that there is no significant relationship of family support with compliance (p=0.20).

7) Marital status & Compliance:
Majority of the subjects were married in both the groups. In the compliant group, 41% were married. Divorced/separated & widowed subjects had lower rates of compliance. Results showed that there is no significant relationship of marital status with compliance (p=0.05).

DISCUSSION
In the current study, no significant association was found between compliant & non-compliant groups as per their socio-demographic characteristics like age, gender, level of education, employment status, family support & marital status and same trend was seen in the study done by

Baby et al. [5] In either of the groups (both compliant and non-compliant), majority of the subjects belonged to the same age group of 26-50 years in our study. Results of current study showed that there is no significant relationship of age with compliance (P=0.98) in accordance with the studies of Gopalan et al, [6] Baby et al. [5]

In our study, majority of the subjects in either of the groups were female. Study done by Gopalan et al, [6] showed the correlation of gender with compliance. But in our study, gender doesn't have any correlation with compliance. Results of the current study showed that there is no significant relationship of gender with compliance (P=0.852) and similar findings were reported by Baby et al. [5] In our study, majority of the subjects were educated upto secondary level and they were compliant because they were aware of benefits of the medicines and that's why they take medicines. Since we didn't have enough sample size for other educational status, results of the current study showed that there is no significant relationship of educational status with compliance (P=0.48) which is in accordance with the study of Jing Jin. [7]

In either of the groups, majority of the subjects were unemployed (lost job due to illness and most of the women's are housewives) in our study. Similar to the study done by Baby et al, [5] results of the current study showed that there is no significant relationship of employment status with compliance (P=0.92). Family income was not correlated with noncompliance in this study by the fact that patient either from poor/middle income background, their family members spare money for patient treatment because of fear of relapse. In our study, majority of the subjects in either of the groups were with no substance abuse. Study of Baby et al [5] showed no significant association between substance abuse and compliance. But a statistical significant association was found between the substance abuse and compliance in our study. Results of current

study showed that there is significant relationship of substance abuse with compliance (P=0.04).

From the findings of Shakeel et al, [8] Solomon et al, [9] Rekha et al, [10] and Baby et al, [5] substance abuse is a strong predictor for non-compliance and similar results had been reported in our study. Denial of illness and substance abuse were responsible for the cause of poor drug compliance. The current study showed that the Patients who chewed nicotine & drank alcohol had a low level of adherence and more likely to be non-compliant to antipsychotic medications which was in accordance with the study of Jing Jin. [7]

In either of the groups, subjects with family support were more, because family members spare money for the patients treatment and support them. In this study, we found that there is no significant relationship of family support with compliance (P=0.20). However, Solomon et al, [9] Gopalan et al [6] found a significant relationship of family support with compliance. This discrepancy in findings is probably because of the different socio-cultural backgrounds between the subjects of both the studies.

From the findings of Srinivasa et al [11] & Gopalan et al, [6] marital status is significantly related with the compliance and found that married subjects were more likely to be compliant but in the current study, there is no significant relationship between marital status with the compliance (P=0.05) since majority of the subjects were married and Divorced/separated, widowed patients were less in our sample. This present finding was in accordance with the study of Baby et al. [5]

The current study findings showed that 56% subjects were adherent & compliant and 44% were non-adherent & noncompliant with antipsychotic treatment, which is consistent with other Indian studies of Maj Agiwangiiu et al, [12] Baby et al. [5] The compliance rates for schizophrenia revealed by Maj Agiwangiiu Newmai et al, [12] reported that out of 100 subjects, 70% were compliant & 30% were non-compliant. Baby et al [5] also studied compliance rates in a sample of 75 subjects, in which 38.7% were non-compliant and 61.3% were compliant.

It is a well-known fact that comparing the rates of drug compliance in schizophrenia is difficult because of the use of different scales and different cut-off points. The difference in the rates of other studies when compared to this study could be due to differences in the assessment tools used and sample selection. Substance abuse and severity of illness were the strong predictors of non-compliance. The current study has used PANSS for assessing the severity of illness & it showed that higher positive symptoms score & higher total PANSS symptoms score predicts non-compliance. In our study, Mean and standard deviation of the PANSS scores in both compliant and noncompliant groups were done & similar findings were reported in the study done by Shakeel et al. [8]

Statistically, significant reasons for compliance and non-compliance were found as per ROMI scale. In the current study, by using ROMI-compliance scale, positive relation with psychiatrist, positive family belief were the most significant contributing factors to the compliance of the medication followed by perceived daily benefit and relapse prevention. Strong influencing factors were found to be perceived daily benefit (74%) and positive family belief (69%). Moderate influencing factors were found to be positive relationship with psychiatrist (54%) and a statement that medication is necessary (51%). Least influencing factors were found to be force to take medication (79%) and fear of re-hospitalization (79%). Highly statistical significant association was found in Reasons for compliance under ROMI Scale (P<0.0001).This finding was also in accordance with the studies of Maj Agiwangiiu et al [12] & Baby et al. [5]

Whereas by using ROMI-noncompliance scale, Denial of illness was the most common reason leading to non-

compliance followed by negative relationship with psychiatrist, practitioner opposed to medications, substance abuse and distressed by side effects. Strong influencing factors were found to be denial of illness (29%) and practitioner opposed to medication (29%). Moderate influencing factors were found to be negative relationship with psychiatrist (68%), no perceived daily benefit (52%) and desire for re-hospitalization (52%) and least influencing factors were found to be family or friends opposed to take medications (77%) and substance abuse (68%). Highly statistical significant association was found in Reasons for non-compliance under ROMI Scale (P=0.0025). This finding was also in accordance with the studies of Maj Agiwangiiu et al [12] & Baby et al. [5]

Shakeel et al, [8] Olfson et al [13] & Adams et al [14] studies proved that Positive doctor-patient relationship is essential in improving compliance & Poor relationship with psychiatrist leads to poor compliance. Stigma related to schizophrenia is exponential. The presence of side effects was also a determining factor for non-compliance, reported by Shakeel et al. [8] The severity of illness was strongly correlated to non-compliance & nonadherence. Previous study of Jing Jin. [7] showed that besides therapy related factors, health care problems were found to be significantly related to compliance. The results of the current study helped us to identify the factors which help in the medication compliance as well as non-compliance, which enable to become more aware of problems faced by the patients in maintaining a compliant behavior thus prevent relapses to the substance abuse, treatment drop-out and re-hospitalization and leading a more productive life.

Limitations

The sample size was small. A large sample may have given more information concerning socio-demographic variables such as level of education, employment status and family support.

CONCLUSION

The study findings concluded that a statistical significant association was found between substance abuse and drug compliance. Highly statistical significant association was found between drug compliance and its influencing factors (p<0.0001). To increase the compliance in schizophrenic patients, further studies and awareness programs should target on these factors and educate the patients about them. So it is essential that schizophrenic patients need adequate support & counseling to help them to integrate into society.

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