EVALUATION OF INSIGHT AND ITS CORRELATION WITH PSYCHOPATHOLOGY AND EXECUTIVE FUNCTIONING IN PATIENTS WITH SCHIZOPHRENIA

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ABSTRACT

BACKGROUND

Insight in mental illness plays major role in the diagnosis as well as is a predictor of treatment response. This holds true and highly impactful in the case of psychotic phenomenon where the absence of Insight was used as the defining theme. In this context, we planned to study the sociodemographic and clinical variables of insight in schizophrenia and its association with executive function and severity of psychotic symptoms.

METHODS

After Institutional Ethics Committee approval, and after getting informed consent from patients, a sample (N) of 53 outpatients with diagnosis of Schizophrenia were recruited. A semi structured proforma was used for sociodemographic and clinical data. Scale to assess Unawareness of Mental Disorder (SUMD), Scale for the Assessment of Positive Symptoms (SAPS), Scale for the Assessment of Negative Symptoms (SANS) and Trail Making Test (TMT) were applied. The data collected were tabulated and analysed.

RESULTS

Mean age was 30 years. 60% were male and 40% were female. The mean duration of illness was 43.62 months and the mean duration of untreated psychosis was 7.06 months. The mean age of onset of illness was 26.74 years. The means of average attribution score and average awareness score from the scale for assessment of unawareness of mental disorders were 2.48 ± 0.66 and 3.66 ± 4.58 respectively. The mean positive symptom score and negative symptom score were 13.7 ± 3.01 and 8.92 ± 4.36 respectively. Multiple regression run to predict insight and total positive symptoms score was not statistically significant ($F(3,49) = 11.148$, $p>.05$). Similarly, multiple regression did not reveal any significant association ($F(1,51) = 3.114$, $p>.05$) between insight and total negative symptom score. Multiple regression run to predict insight from executive functions represented by TMT-A and TMT-B scores revealed no significant association ($F(2,50) = 9.010$, $p>.05$) between executive function and insight.

CONCLUSIONS

This implies that Insight should be looked upon and evaluated not just as part of schizophrenia, but also as a symptom by itself. Future studies should use a technique of comparing low and high insight groups so as to bring to light any small associations.

KEYWORDS

Insight, Schizophrenia, Psychopathology, Executive function.

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BACKGROUND

Insight in mental illness plays a major role in the diagnosis as well as a predictor in treatment response. Despite difficulties faced in understanding insight, and finding its associations, it is closely related to schizophrenia, where an almost universal finding of poor insight is known to be present. Mental health professionals believe that lack of insight is a major problem in schizophrenia because it significantly interferes with adherence to medical treatment. Yet few researchers have attempted to ask people with schizophrenia for their views on how insight develops and impacts on their quality of life.[1] Several models have been proposed by researchers which kindled the revival of interest in the field of Insight, which overcomes the traditional view that considered it to be a single entity.[2] It is interesting to

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understand the relationship of insight as an individual existence, or as part of schizophrenia, or as part of executive functions of the brain. Very limited studies have been published from the Indian setting examining the relationship between insight and psychopathology off schizophrenia. Globally researchers still differ in the various assessment tools used to measure insight which are culturally sensitive. Relationship between insight, executive functions and symptoms of schizophrenia are important factors towards medication compliance and hence better understanding is required in this area. In this context, we aimed to study the sociodemographic and clinical correlates of insight in schizophrenia and its association with executive function and severity of psychotic symptoms.

METHODS

Study Design

A hospital based cross sectional study was undertaken.

Sample Size

53.

Sampling Procedure

All patients reporting to the OPD, diagnosed as Schizophrenia as per ICD 10 Diagnostic criteria for research, fulfilling the inclusion and exclusion criteria from Oct 2013 to July 2014.

Inclusion Criteria

1. ICD 10 diagnosis of schizophrenia.
2. Age of 18 years to 65 years.
3. Consent and cooperation for examination and availability of informant.
4. Onset of illness after age 18 years.

Exclusion Criteria

1. Patients who did not complete the evaluation.
2. Comorbid organic illnesses.
3. Comorbid substance dependence.
4. Other comorbid Axis I diagnosis.

Materials

1. A semi structured proforma for sociodemographic and relevant clinical data.
2. Scale to assess Unawareness of Mental Disorder[3,4] (SUMD)- a semi-structured interview and scale that was designed to evaluate the multidimensional nature of insight. Scores are rated on a five-point scale (1=complete awareness, 3= partial awareness and 5=no awareness).
3. Scale for the Assessment of Positive Symptoms[5] (SAPS)- a 34 item scale for use in schizophrenia. It is administered via a general clinical interview with some specific questions. All items are rated from 0 (absent) to 5 (Severe). Ratings from SAPS are divided into two symptom dimensions which include Psychoticism (delusions and hallucinations) and Disorganization (bizarre behaviour, formal thought disorder and inappropriate affect). The SAPS is a well validated instrument and is widely used.
4. Scale for the Assessment of Negative Symptoms[6] (SANS)- The Scale for the Assessment of Negative Symptoms (SANS)[6] is a 25-item scale designed to assess negative symptoms in schizophrenia. The symptoms measured are alogia, affective flattening, avolition-apathy, anhedonia-asociality and inattention. The SANS is a popular and well validated and used both clinically and in research.
5. Trail making test (TMT)- Executive functioning of patients with schizophrenia was tested using the Trail Making Test (TMT) which consists of two parts, TMT A and TMT B. Results for both TMT A and B are reported as the number of seconds required to complete the task; therefore, higher scores reveal greater impairment.

After Institutional Ethics Committee (IEC) Approval, this cross-sectional study was done in a sample of patients with schizophrenia who attended Psychiatry outpatient department and in those who were admitted in psychiatry wards of our tertiary medical college hospital for either an exacerbation of illness or an initial episode. Both male and female patients were chosen. Consecutive male and female patients with a diagnosis of schizophrenia who presented to in the institute and fulfilling the criteria were chosen. The diagnosis of schizophrenia was made as per ICD 10 clinical criteria, independently by two persons, a senior psychiatrist and the investigator. Those who fulfilled the above inclusion and exclusion criteria were chosen for the study. Onset age less than 18 years was excluded to prevent inclusion of early onset schizophrenia that have high levels of cognitive dysfunction and hence could potentially confound the results. Similarly, patients aged greater than 40 years were included only if present with florid symptomatology so as to minimize the chances of age and illness chronicity influencing executive function scores. Comorbid substance dependence, Axis I disorders and organic illnesses were excluded for the same reason. Informed and written consent was obtained. The interviews and assessments were done in the hospital during the active presentation of symptoms. All assessments were done by the investigator. The assessment of psychopathology and insight was done before administration of the TMT so as to minimize interviewer bias. A single cross-sectional assessment was done in which, all tests were administered preferably in a single sitting or within a few days of each other so as to maintain the cross-sectional nature of the assessment. The study was naturalistic with regard to treatment adopted either in the past or in the current admission.

Statistical Analysis

The data collected was tabulated and analyzed with reference to the aims and objectives of the study using SPSS version 22. Descriptive statistics (Mean, SD) were used to describe the sociodemographic and clinical data. Multiple regression analysis was done to determine the independent effects of significant variables on insight.

RESULTS

The Mean age of our study population in years was 30.40 ± 8.11 and the highest percentage of 44.4% was seen in the age group of 26 to 35 years, and the lowest as 3.7% in the 46 to 55 years age group. It was observed that out of the total (N=53) study subjects, 60% were male (n = 32) and 40% were female (n=21). The descriptive statistics of the sociodemographic and clinical variables are given in the below tables 1 & 2.

Sociodemographic Parameter		Frequency	Percentage (%)
Educational Status	Primary	1	1.9
	Middle	9	17.0
	Secondary	9	17.0
	Higher secondary	9	17.0
	Undergraduate	23	43.4
	Postgraduate	2	3.8
Religion	Hindu	49	92.5
	Christian	2	3.8
	Muslim	2	3.8
Marital Status	Unmarried	25	47.2
	Married	21	39.6
	Separated	7	13.2
Employment	Employed	21	39.6
	Unemployed	32	60.4
Residence	Urban	16	30.2
	Rural	37	69.8
Type of Schizophrenia	Paranoid	46	86.8
	Undifferentiated	5	9.4
	Catatonic	1	1.9

Table 1. Sociodemographic Profile and Diagnosis of The Patients

Clinical Variable	n	Minimum	Maximum	Mean (± SD*)
Age	53	17	53	30.40(8.11)
Total positive symptoms score	53	7	19	13.70(3.01)
Total negative symptoms score	53	0	20	8.92(4.36)
Average attribution score	53	1.30	20.60	3.38(2.54)
Average awareness score	53	1.10	30.70	3.66(4.58)
Trail making test – A	53	20	220	73.87(40.13)
Trail making test – B	53	48	382	159.81(82.07)
Duration of untreated psychosis	53	1	24	7.06(5.51)
Duration of illness	53	1	204	43.62(53.35)
Age of onset	53	17	50	26.74(6.96)
Number of admissions	53	1	10	2.40(3.42)

Table 2. Descriptive Data of Various Clinical Variables (*SD= Standard Deviations)

The following table shows that correlation between average attribution score and other clinical variables like duration of illness, duration of untreated psychosis, age of onset of illness and type of schizophrenia is not statistically significant.

	Average Attribution Score	Duration of Illness	Duration of Untreated Psychosis	Age at Onset	Type of Schizophrenia
Pearson r Average Attribution Score	1.000	.168	.255	-.082	.128
Sig. (1-Tailed) Average Attribution Score	.	.115	.033	.280	.180

Table 3. Correlation Between Clinical Variables

Table 4 shows the multiple correlation coefficient (R value) as .430 which indicated a weak level of prediction. R Square value of .185 shows that the independent variables explain 18.5% of the variability of the dependent variable i.e., Insight (average attribution score).

Model	R	R Square	Adjusted R Square
1	.430	.185	.078

Table 4. Showing Model Summary of Regression Analysis

a. Predictors: (Constant), Education, Age at Onset, Duration of Untreated illness, Duration of illness, Type of schizophrenia, Age.
b. Dependent Variable: Average attribution score.

Table 5 shows that the independent variable could not predict the dependent variable and is not statistically significant, F(6,46)= 1.738, p>.05, hence the regression model is not a good fit of the data.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	4.302	6	.717	1.738	.134
Residual	18.979	46	.413		
Total	23.281	52			

Table 5. ANOVA

a. Predictors: (Constant), Education, Age at Onset, Duration of Untreated illness, Duration of illness, Type of schizophrenia, Age.
b. Dependent Variable: Average attribution score.

The below table shows that the unstandardized coefficients of all the independent variables vary very weakly with the dependent variable (average attribution score) and are not statistically significant.

Parameter	Un-standardized Coefficients B	t	Sig.	95.0% Confidence Interval for B	
				Lower Bound	Upper Bound
(Constant)	3.461	5.411	.000	2.174	4.748
Duration of illness	-.003	-.901	.372	-.010	.004
Duration of untreated Psychosis	.036	2.003	.051	.000	.072
Age at onset	-.054	-1.544	.129	-.125	.016
Type of schizophrenia	-.174	-.890	.378	-.566	.219
Age	.044	1.283	.206	-.025	.114
Education	-.160	-2.092	.042	-.315	-.006

Table 6. Coefficients

a. Dependent Variable: Average Attribution Score.

From the tables numbered 3, 4, 5, 6, it has been inferred that the multiple regression run to predict insight from age, educational status, type of schizophrenia, duration of untreated psychosis, duration of illness, and age of onset of illness is not statistically significant F(6,46) = 1.738, p>.05 and the clinical variables did not predict the variations in Insight.

Multiple Regression Analysis of Insight and Positive Symptoms

The following table no. 7 shows that correlation between average awareness score and positive symptoms i.e., average disorganization score, average psychoticism score and total positive symptoms score is not statistically significant.

	Average Awareness Score	Average Disorganization Score	Average Psychoticism Score	Total Positive Symptoms Score
Pearson Correlation Average Awareness Score	1.000	.116	.122	.149
Sig. (1-tailed) Average Awareness Score	.	.205	.192	.143

Table 7. Correlations

The below Table no 8 shows the multiple correlation coefficient (R value) as .175 which indicated a weak level of prediction. R Square value of .031 shows that the independent variables explain 3.1% of the variability of the dependent variable i.e., Insight (Average awareness score).

Model	R	R Square	Adjusted R Square
1	.175	.031	-.029

Table 8. Model Summary

a. Predictors: (Constant), Total positive symptoms score, Average disorganization score, Average psychoticism score.
b. Dependent Variable: Average awareness score.

Table no. 9 shows that the independent variable could not predict the dependent variable and is not statistically significant, F(3,49) = 11.148, p>.05, hence the regression model is not a good fit of the data.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	33.44	3	11.148	.515	.674
Residual	1061.47	49	21.663		
Total	1094.91	52			

Table 9. ANOVA

a. Predictors: (Constant), Total positive symptoms score, Average disorganization score, Average psychoticism score.
b. Dependent Variable: Average awareness score.

Table No 10 shows that the unstandardized coefficients of all the independent variables (Average disorganization score, Average psychoticism score, Total positive symptom score) very weakly with the dependent variable (average awareness score) and are not statistically significant.

Model	Unstandardized Coefficients B	t	Sig.	95.0% Confidence Interval for B	
				Lower Bound	Lower Bound
(Constant)	.685	.220	.826	-5.561	6.931
Average disorganization score	2.958	.647	.520	-6.225	12.141
Average psychoticism score	4.481	.631	.531	-9.784	18.745
Total positive symptoms score	-1.254	-.541	.591	-5.917	3.408

Table 10. Coefficient

a. Dependent Variable: Average awareness score.

From the above tables numbered 7, 8, 9, 10, it is observed that a multiple regression was run to predict insight from Average disorganization score, average psychoticism score and total positive symptoms score. These variables are not statistically significant F(3,49) = 11.148, p>.05 and did not predict the variations in Insight.

	Average Awareness Score	Total Negative Symptom Score
Pearson Correlation Average Awareness Score	1.000	-.053
Sig. (1-tailed) Average Awareness Score	.	.352

Table 11. Correlations. (Multiple Regression Analysis of Insight and Negative Symptoms)

Table no 12 shows the multiple correlation coefficient (R value) as .053 which indicated a weak level of prediction. R Square value of .003 shows that the independent variables explain 0.3% of the variability of the dependent variable i.e., Insight (Average awareness score).

Model	R	R Square	Adjusted R Square
1	.053	.003	-.017

Table 12. Model Summary

a. Predictors: (Constant), Total negative symptom score.
b. Dependent Variable: Average awareness score.

Table no 13 shows that the independent variable could not predict the dependent variable and is not statistically significant, F(1,51) = 3.114, p>.05, hence the regression model is not a good fit of the data.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	3.114	1	3.114	.145	.704
Residual	1091.800	51	21.408		
Total	1094.914	52			

Table 13. ANOVA

a. Predictors: (Constant), Total negative symptom score.
b. Dependent Variable: Average awareness score.

Table 14 shows that the unstandardized coefficients of all the independent variable (Total negative symptom score) varies weakly with the dependent variable (average awareness score) and is not statistically significant.

Model	Unstandardized Coefficients b	t	Sig.	95.0% Confidence Interval for B	
				Lower Bound	Upper Bound
(Constant)	4.169	1.458		2.859	.006
Total negative symptom score	-.056	.147	-.053	-.381	.704

Table 14. Coefficient
(a. Dependent Variable: Average Awareness Score)

From the above tables 11,12,13 and 14 it is clear that the multiple regression run to predict insight from Total negative symptom score was not statistically significant $F(1,51) = 3.114$, $p>.05$ and the negative symptoms did not predict the variations in Insight.

Multiple Regression Analysis of Insight and Executive Functions

The following table no. 15 shows that correlation between average awareness score and executive functions (TMT-A and TMT-B) is not statistically significant.

	Average Awareness Score	TMT-A	TMT-B
Pearson Correlation Average Awareness Score	1.000	-.124	-.075
Sig. (1-tailed) Average Awareness Score	.	.187	.297

Table 15. Correlations

The below table no 16 shows the multiple correlation coefficient (R value) as .128 which indicated a weak level of prediction. R Square value of .016 shows that the independent variables explain 1.6% of the variability of the dependent variable i.e., Insight (Average awareness score).

Model	R	R Square	Adjusted R Square
1	.128	.016	-.023

Table 16. Model Summary

a. Predictors: (Constant), TMT B, TMT A.
b. Dependent Variable: Average awareness score.

Table 17 shows that the independent variable could not predict the dependent variable and is not statistically significant, $F(2,50) = 9.010$, $p>.05$, hence the regression model is not a good fit of the data.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	18.020	2	9.010	.418	.660
Residual	1076.894	50	21.538		
Total	1094.914	52			

Table 17. ANOVA

a. Predictors: (Constant), TMT B, TMT A.
b. Dependent Variable: Average awareness score.

The below table no 18 shows that the unstandardized coefficients of all the independent variables (TMT-A and TMT-B) varies weakly with the dependent variable (average awareness score) and is not statistically significant.

Parameter	Unstandardized Coefficients B	t	Sig.	95.0% Confidence Interval for B	
				Lower Bound	Upper Bound
(Constant)	4.602	3.174	.003	1.690	7.515
TMTA	-.019	-.742	.461	-.069	.032
TMTB	.003	.225	.823	-.022	.027

Table 18. Coefficient

a. Dependent Variable: Average awareness score

The inference from the tables 15,16,17,18 is that the multiple regression run to predict insight from Executive functions represented by TMT-A and TMT-B scores was not statistically significant ($F(2,50) = 9.010$, $p>.05$).

DISCUSSION

The level of insight was less when compared to many of the published studies.[7,8] This might also reflect cultural differences as well in the assessment of insight. The lack of association between insight and duration of illness and number of admissions is contrary to findings by Drake et al.[9] However, Amador et al[10] and Mintz et al[11] give the same findings. The results are also explainable by the relatively young age of the sample which could influence such an association. All the clinical variables assessed could only account for about 18.5 percent of variance in insight score. The mean score on psychopathology scores ranged between 13.7 for positive symptoms and 8.7 for negative symptoms. This was comparable to other reported studies which had used a similar sample.[12,13] The positive and negative symptoms severity assessed, could only account for about 17.5% to 5.3% variance respectively in insight score. Difference in correlation between psychopathology and insight when compared to previous studies maybe explained due to the cultural backdrop of the sample selected. However, studies that compared insight and psychopathology in the Indian population also proved similar results.[14,15] Executive functions indicated approximately 1.6% of the insight variance that could be accounted for by the factors entered. This is contradicting with previous studies by Keshavan et al[7] and Cuesta et al[16] who found that regression models predicted 10% and 23% of the variance in insight. The reason behind this maybe the use of WSCT by the previous studies, whereas our study used TMT to assess executive functions. The strengths of the study were the homogenous sample for age and education, use of SUMD for insight and TMT for executive functions. The limitations were hospital-based study, small sample size,

cross sectional nature and did not include premorbid functioning.

CONCLUSIONS

There is no correlation between insight, psychopathology and executive function. These results are in accordance with a majority existing literature, even though few other studies contradict the findings. This implies that Insight should be looked upon and evaluated not just as part of schizophrenia, but also as a symptom by itself. The results of this study would be helpful in the development of comprehensive and culturally sensitive scales to measure the diverse domains that are appropriate to our Indian settings. Future studies should use a technique of comparing low and high insight groups so as to bring to light any small associations. With understanding of insight and cognition, the consideration of meta-cognitive processes which underlie thinking and insight can now commence.

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