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Original Research Article

A Brief Cognitive Assessment of Patients with Schizophrenia and its Correlation with Disease Severity and Disability: A Tertiary Hospital Based Cross Sectional Study

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Conflict of interest: Nil

Abstract

Background: The present study was conducted to assess the cognitive functions in patients with schizophrenia and to study the relationship between cognition and disease severity and disability.

Methodology: A cross sectional study conducted by including 50 patients diagnosed with Schizophrenia. Had used PANSS, DSST, Trail making test, Category fluency test and IDEAS scale to assess the patients.

Results: Average age was 38.5±7.8 years with male predominance. On analysing the PANSS, 47 (94%) of the study population were mildly ill and two were moderately ill and one was severely ill. Out of 50, 6 patients could not complete the DSST analysis, 15 (30%) had the score between 21 to 30, 11 (22%) of them were scored between 21 to 30, 10 (20%) had the score of 10 or less than that. On analysing the IDEAS, 24 (48%) of them had moderate quantified disability, 16 (32%) with mild and 10 (20%) with severe disability. Association between PANSS with trail making test was moderately significant (0.073), digital symbol test (0.08) and the IDEAS score (0.06) but the Category fluency test had the significant association with p value of <0.01.

Conclusion: There was significant positive association of PANSS score had with category fluency test with the p value of <0.01 but there was moderate association observed with trail making test, digital symbol test and IDEAS score. Although the difference was XIV clinically significant, only moderate significance on statistical analysis was proved. This indicates that category fluency test could obtain us the better assessment compared to other but, not negligible.

Keywords: Schizophrenia, PANSS, DSST, Trail Making Test, Cognitive Assessment.

Introduction

Schizophrenia is a complex, heterogeneous behavioural and cognitive syndrome whose origins appear to lie in genetic and/or environmental disruption of brain

development. Dysfunction of dopaminergic neurotransmission appears to contribute to the genesis of psychotic symptoms but the evidence also points to a more widespread and variable involvement of brain areas and circuits. The symptoms broadly characterized as positive symptoms and negative symptoms. The positive symptoms include hallucinations, delusions, and disorganized speech whereas the negative symptoms predominantly describe apathy, avolition and poverty of speech.[1,2]

Approximately 20–24 million people worldwide are suffering from schizophrenia. Global burden of disease study reported that the schizophrenia accounted for 1.1% of the total disability-adjusted life year (DALYs) and 2.8% of Years lived with disability (YLDs).[2]

National Mental Health Survey of India (2016) also reported that the prevalence of common mental disorders in India being 5.1%. This CMD includes generalized anxiety disorder, social phobia, agoraphobia, panic disorder, obsessive-compulsive disorder, posttraumatic stress disorder and also schizophrenia.

Unemployment is staggeringly high at 80–90% and the average life expectancy is reduced by 10-20 years among these patients with mental disorders.[3-5]

Cognitive functions are required to perform in the spheres of personal, social and occupational activities of everyday life. Broadly, cognition can be divided into two broad categories: Neurocognition and social cognition.[6]

The main neurocognitive functions are information processing, attention, executive functions, comprehension, learning and memory. Social cognition includes those set of cognitive processes involved in interaction with the social world. Disability is “any restriction or lack (resulting from any impairment) of ability to perform an activity in the manner or within the range considered normal for a human being,” (WHO).[7]

Disabilities include poor selfcare, inability to manage the tasks of daily living, social withdrawal, poor functioning in affinitive roles, and work incapacity. Despite of all the available mode of management for schizophrenia, has been found to be the fourth leading cause of disability in the world.

Social disability has been the most common form observed. Disability in schizophrenia is said to be contributed by its positive and negative symptoms, cognitive deficits, and soft neurological signs. Restoring cognitive function or bypassing cognitive impairment could significantly contribute to better outcome and recovery in schizophrenia.[8,9]

So far the studies assessing cognition in India have either used lengthy assessment tools or have assessed only a particular area of cognition Brief Assessment of Cognition in Schizophrenia (BACS) is a brief assessment tool which takes around 20 min, measures all the domains of cognition which tend to be impaired in schizophrenia and has been found to be as reliable as lengthy measures of cognition. Indian studies using tools such as BACS are scanty. Hence, we would like to take up the study to assess the cognitive functions in patients with schizophrenia and to study the relationship between cognition and disease severity and disability.

Materials and Methodology

The study is a cross-sectional analysis conducted in the department of Psychiatry. The study was conducted for a period of one year. The patients of either Gender, aged more than 18 years, diagnosed with schizophrenia on clinical and psychiatric analysis were the study subjects.

Inclusion Criteria

- All patients with schizophrenia coming to Psychiatry department (IPD and OPD).
- Patients above 18 years
- Patients meeting ICD-10 criteria diagnosis for schizophrenia.
- Patients willing to give written informed consent to be a part of this study.

Exclusion Criteria

- Patients with other psychiatric comorbidities
- Schizoaffective patients
- Patients below 18 years
- Patients who have undergone MECT within 4 weeks of the study

Sample size: 50, Convenience sampling was used

Patients with schizophrenia (ICD10) coming to psychiatry dept from the date of ethical clearance to a period of 12 months and giving consent for participation in the assessment.

Ethical clearance obtained. After including the patients, detailed protocol was explained in their understandable language. If the patients themselves were unable to make the decision, then the consent was obtained from the care taker.

The following tool for analysis were used;

Socio demographic & clinical Proforma: sociodemographic details of patients were collected using a semi-structured proforma.

Positive and negative syndrome scale (PANSS): This scale had been applied to assess the severity of disease.

Brief Cognitive assessment by (BACS) - Tools used to assess cognition of the patient.

a. Digit symbol substitution test

b. Trial making test

c. Category fluency test.

Ideas scale- it is used to measure the disability in the patients.

Statistical Tests:

All data had been analysed using SPSS software version 20, chi-square test, association analysis, independent t test was used.

Results

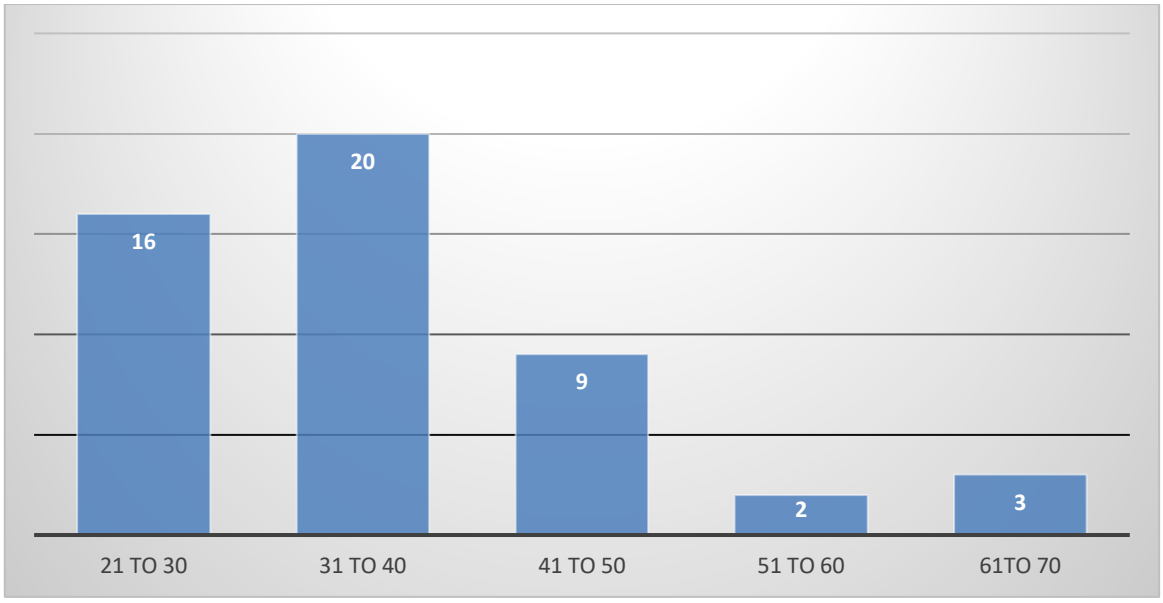
Sample size: 50

Table 1: Distribution of age

Distribution of age	N= 50	%
21 to 30	16	32
31 to 40	20	40
41 to 50	9	18
51 to 60	2	4
61to 70	3	6

P 0.11

Out of 50 study population, the incidence of study participants aged between 31 to 40 was higher accounting for about 40% followed by 32% aged between 21 to 30 years. 9 (18%) were aged between 41 to 50 years and three patients were aged between 61 to 70 years and the rest two were 51 to 60 years.



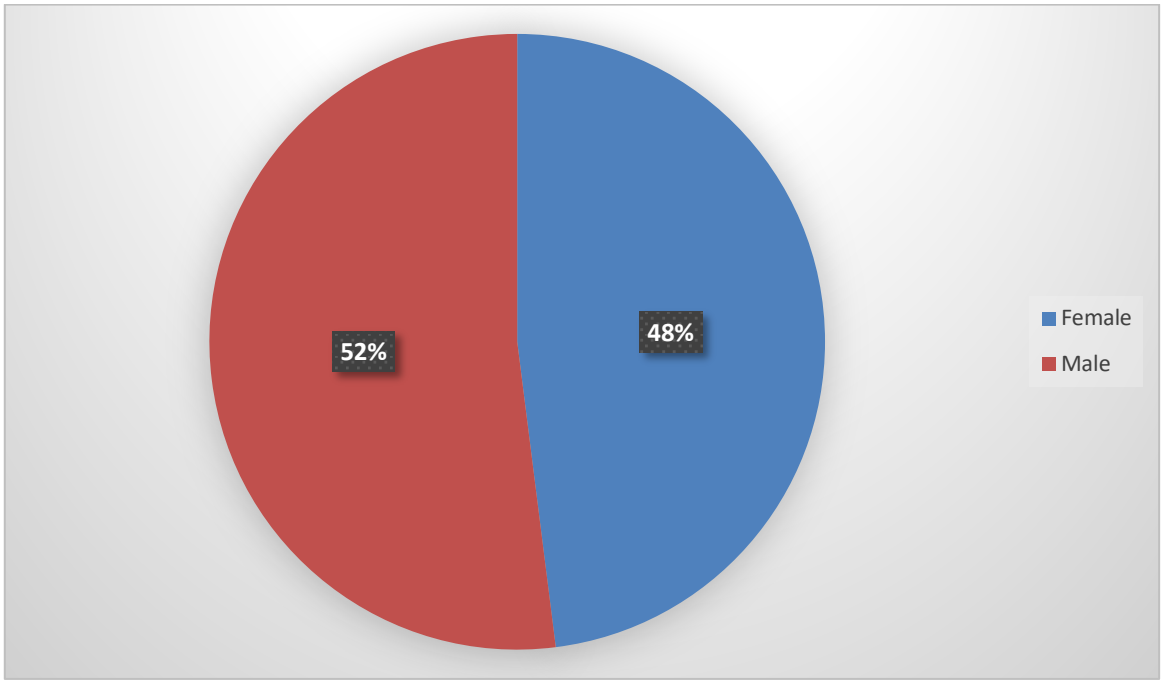
Graph 1: Distribution of age

Table 2: Distribution of gender

Gender distribution	N=50	%
Female	24	48
Male	26	52

P 0.18

Out of 50 patients 26 were male and the rest 24 were females.

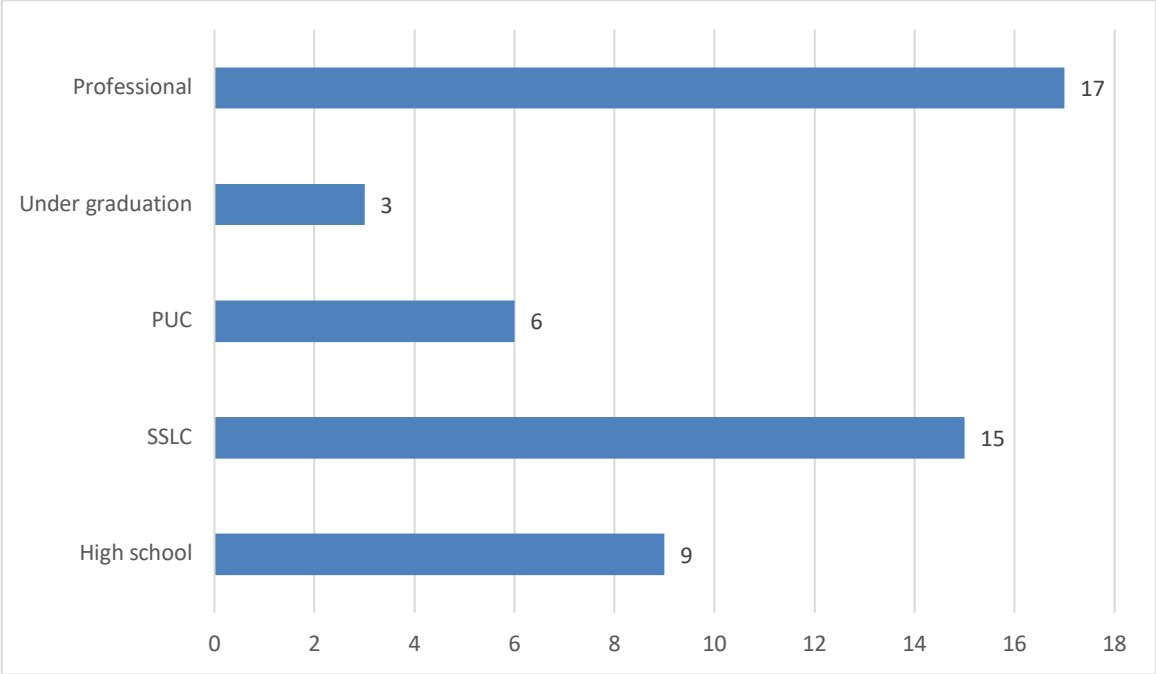


Graph 2: Distribution of gender

Table 3: Distribution of educational qualification

Education qualification	N=50	%
High school	9	18
SSLC	15	30
PUC	6	12
Under graduation	3	6
Professional	17	34

Majority of them had complete professional course with the incidence of 17 (34%) followed by 15 (30%) with SSLC. 9 (18%) had completed high school and the rest 6 (12%) had completed PUC. 3 (6%) had their under-graduation degree.



Graph 3: Distribution of education qualification

Table 4: Distribution of Religion

Distribution of Religion	N=50	%
Hindu	47	94
Muslim	3	6

P 0.001

7/50 (94%) were Hindus and the rest 6% were from Muslim religion

Table 5: Distribution of Marital status

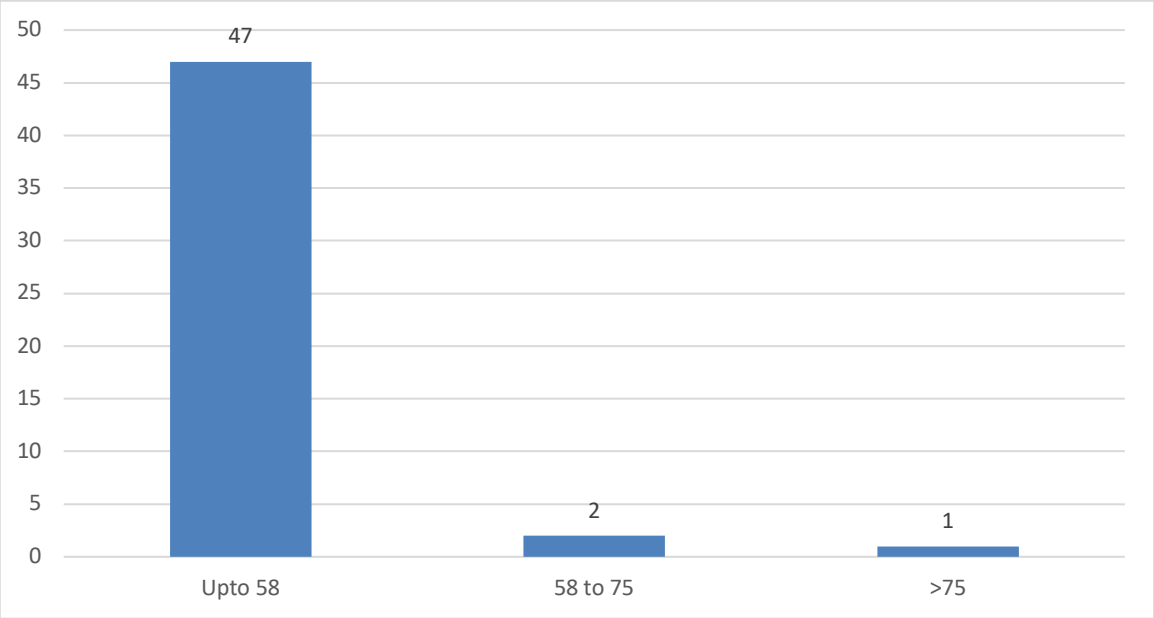
Marital status	N=50	%
Married	30	60
Single	20	40

Out of 50 cases, 30 (60%) were married and the rest 20 (40%) were not.

Table 6: Distribution of Distribution of PANSS score

Distribution of PANSS	N=50	%
Upto 58	47	94
58 to 75	2	4
>75	1	2
P value	<0.001, upto 58 was significant	

Based on the above table, we could assess that 47 (94%) of the study population were mildly ill and out of other three patients, two of them were moderately ill and one was severely ill.

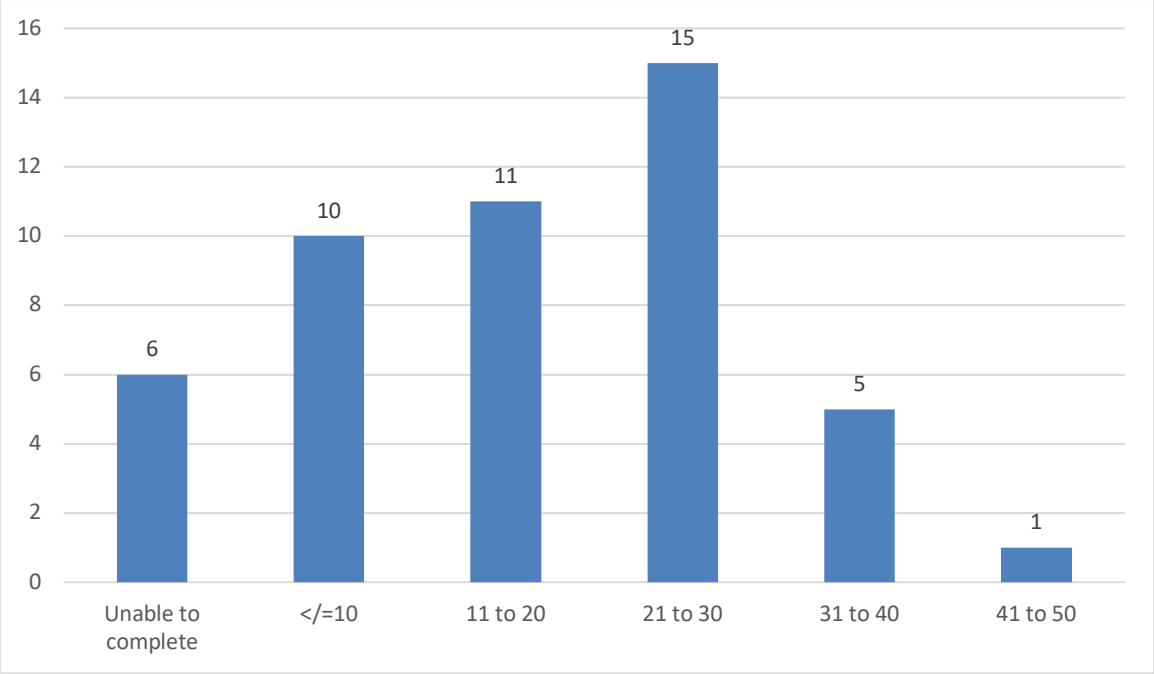


Graph 4: Distribution of PANSS severity index

Table 7: Distribution of DSST scoring system

Distribution of DSST score	N=50	%
Unable to complete	6	12
</=10	10	20
11 to 20	11	22
21 to 30	15	30
31 to 40	5	25
41 to 50	1	2
P value	0.1	

Out of 50 cases, 6 patients could not complete the DSST analysis, 15 (30%) had the score between 21 to 30 followed by 11 (22%) of them were scored between 21 to 30, 10 (20%) had the score of 10 or less than that. Five patients and the rest one of them had the score between 31 to 40 and 41 to 50.

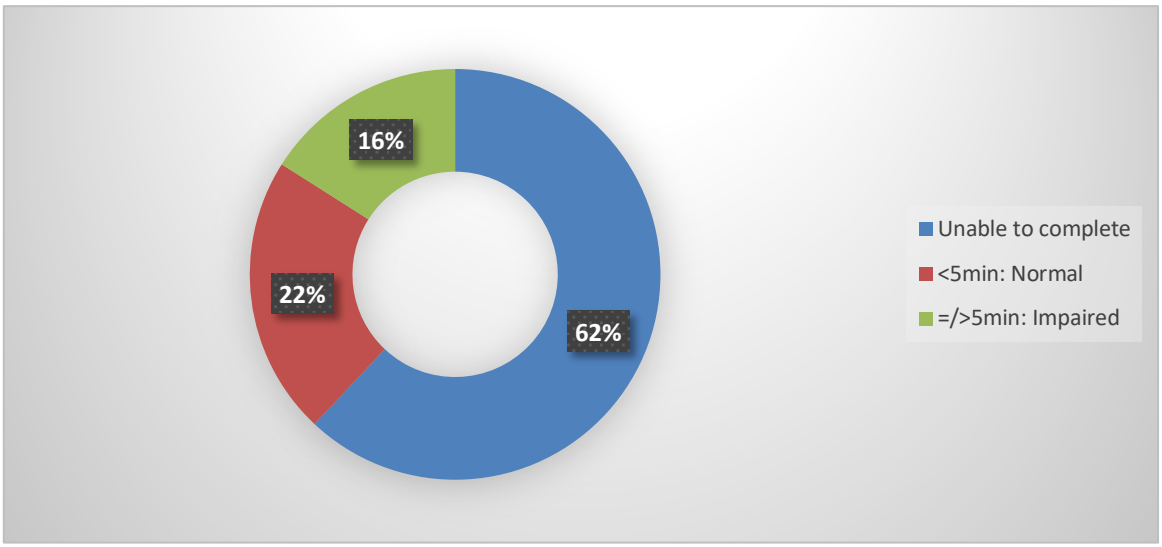


Graph 5: Distribution of DSST scoring

Table 8: Distribution of trail making test outcome

Distribution of trail making test outcome	N=50	%
Unable to complete	31	62
<5min: Normal	11	22
=/>5min: Impaired	8	16
P value	0.063	

Out of 50 patients, 31 (62%) were unable to complete the test. 11 (22%) had taken the normal time to complete the task. 8 (16%) had taken 5 min and more, who were considered as the patients with impaired time taken for trail making test.

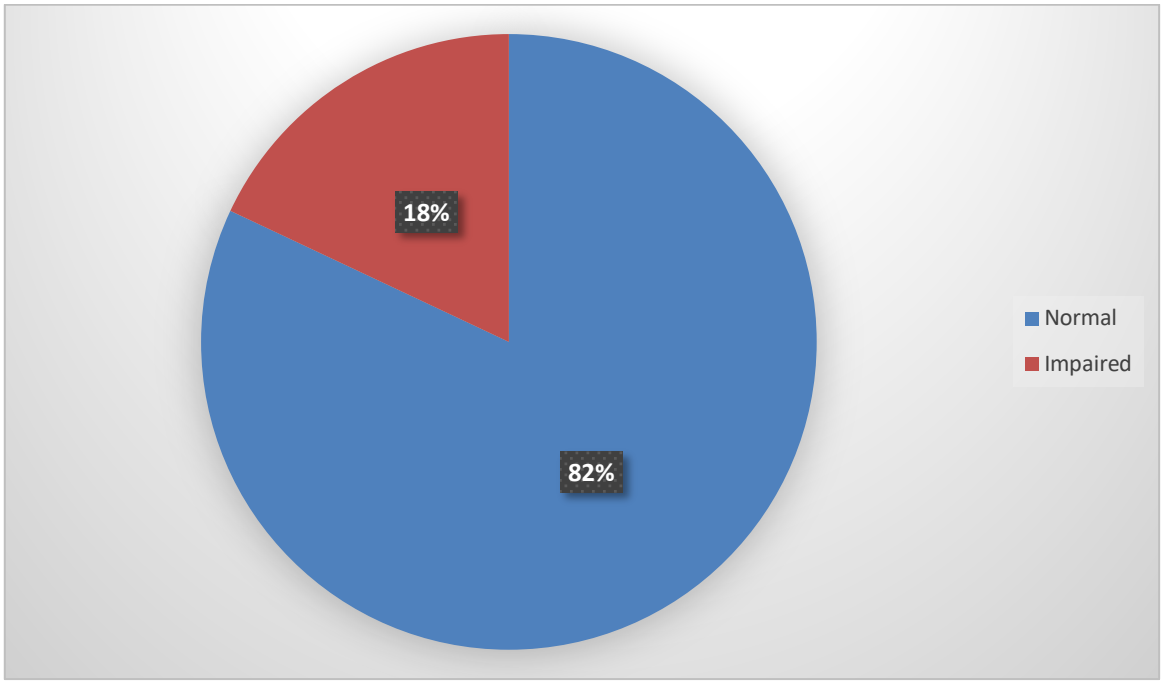


Graph 6: Distribution of trail marking test

Table 9: Distribution of Category influence test

CATEGORY FLUENCY TEST	N	%
Normal	41	82
Impaired	9	18
P value	<0.001	

Category influence test was normal among 41 (82%) of the patients and the rest 9 (18%) had impaired test outcome.

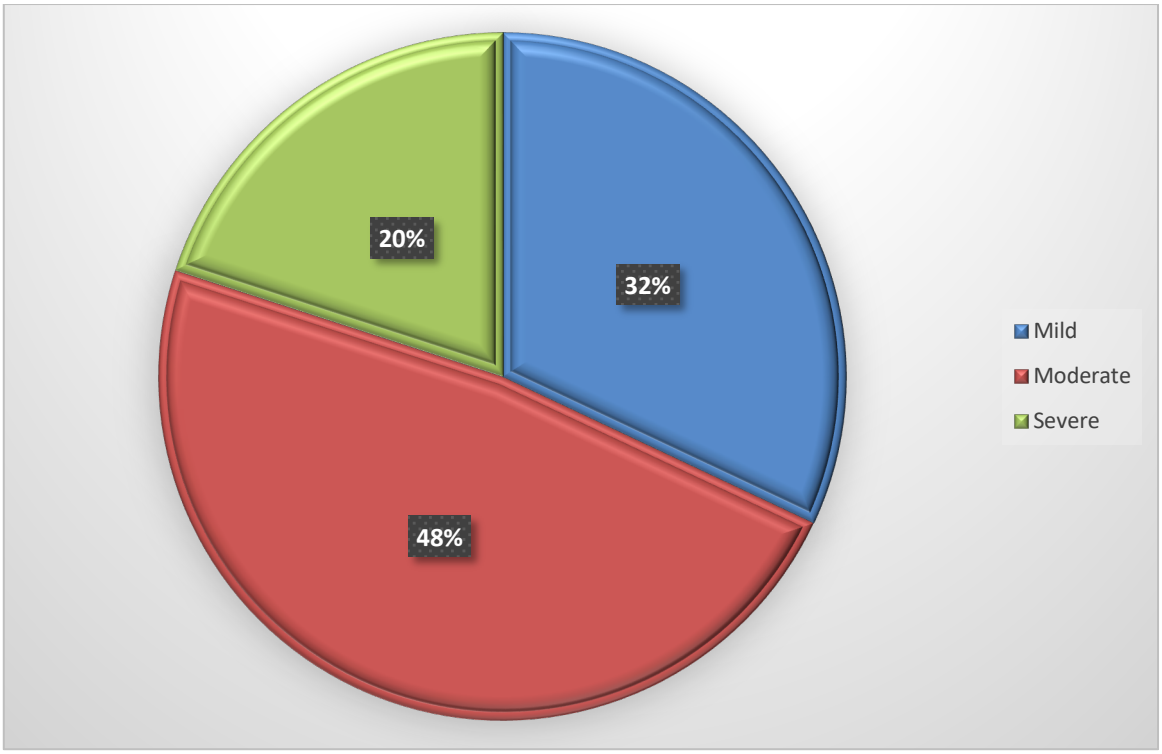


Graph 7: Distribution of Category influence test

Table 10: Distribution of IDEAS scale

Distribution of IDEAS SCALE	N	%
Mild	16	32
Moderate	24	48
Severe	10	20
P value	0.11	

Out of 50 cases, 24 (48%) of them had moderate quantified disability followed by 16 (32%) with mild and the rest 10 (20%) with severe disability.



Graph 7: Distribution of IDEAS score

Table 11: Association between PANSS with other components of CBT test

Association tables	P value
PANSS score with Trail making test	0.073
PANSS score with Digital symbol test	0.08
PANSS score with Category fluency	<0.001
PANSS score with IDEAS score	0.06

From the above table, we could assess that the PANSS score had significant positive association with category fluency test with the p value of <0.001 but there was moderate association observed with trail making test, digital symbol test and IDEAS score. Although the difference was clinically significant, only moderate significance on statistical analysis was proved. This indicates that category fluency test could obtain us the better assessment compared to other but, not negligible.

Discussion

Schizophrenia is a mental illness which will be having chronic course and it has adverse consequences on not only the individual with the disease but also on family and society. The Cognitive impairment is one of the core features of schizophrenia.[2,3]

The onset, course and the progression of the cognitive deficits remains debatable. Some studies have been reported an onset of cognitive deficits during the first episode of psychosis while few other studies have reported a progressive decline along the course of the illness.[1-3]

The cognitive deficits also have huge impact on overall functioning by affecting the social competence and reduced capacity for independent living and vocational success. This cross-sectional study aimed to look at the cognitive functioning in patients with schizophrenia, relationship between cognitive functioning, psychopathology and disability and the risk factors for cognitive deficits.[5,6]

The present study was conducted to assess the cognitive functions in patients with schizophrenia and to study the relationship between cognition and disease severity and disability. We had included 50 patients with schizophrenia.

Demographic Details

Out of 50 study population, the incidence of study participants aged between 31 to 40 was higher accounting for about 40% followed by 32% aged between 21 to 30 years. 9 (18%) were aged between 41 to 50 years and three patients were aged between 61 to 70 years and the rest two were 51 to 60 years.

Out of 50 patients 26 were male and the rest 24 were females. Majority of them had complete professional course with the incidence of 17 (34%) followed by 15 (30%) with SSLC. 9 (18%) had completed high school and the rest 6 (12%) had completed PUC. 3 (6%) had their under-graduation degree. Irrespective of our observations, the employment status from having a stable job to be an unemployed after the onset of illness have been led to the decline in cognitive functioning as also reported in the study by Trivedi et al.[35] Even could be or due to the negative symptoms as mentioned in the study by Srinivasan et al.[61]

In the present study, 47/50 (94%) were Hindus and the rest 6% were from Muslim religion. Out of 50 cases, 30 (60%) were married and the rest 20 (40%) were not.

Similar to our study, Jain M et al also observed that a maximum number of patients was in the age group of 26-35 years (53.33%) with a mean age of 29.87 years. More than two-thirds of the study population were males (83.33%). The majority of the subjects in the schizophrenia group were Hindu (93.3%) in Jain M et al but they had majority of the unmarried patients.[53]

PANSS scoring

As we all know, Positive and negative symptom scale [PANSS] is one of the standard measure scale to assess the severity of schizophrenia. In the PANSS, there are three subscales-the positive, negative and the general psychopathology. On analysing PANSS in our study, 47 (94%) of the study population were mildly ill and out of other three patients, two of them were moderately ill and one was severely ill. The reason behind many of them being mild symptoms could have been due to the selection of patients who were clinically stable with no medication changes in the past one month. Patients with acute disturbance, necessitating the need for change in dose of the antipsychotic medication, are the likely to have higher scores on PANSS.

Unlike our study, Jain M et al had mentioned that the mean PANSS score was 8.13 on the positive scale, 11.27 on the negative scale, and 20.37 on the General Psychopathology Scale (GPS) but hey have not categorised the patients based on the total score obtained.[53]

DSST and Other Analysis Tests

Out of 50 cases, 6 patients could not complete the DSST analysis, 15 (30%) had the score between 21 to 30 followed by 11 (22%) of them were scored between 21 to 30, 10 (20%) had the score of 10 or less than that. Five patients and the rest one of them had the score between 31 to 40 and 41 to 50. Rosano C et al had reported that DSST test had significant positive association with psychiatric illness.[62] Even Dadrewal MC et al had observed that the DSST as an optimal cut-off in identifying severe cognitive deficits with an additional MoCA cut-off of 27 for identifying mild cognitive deficits had given the better outcome analysis. They also observed that the Combined MoCA and DSST is a sensitive and quick method to screen for neurocognitive deficits in schizophrenia.[63]

Out of 50 patients, 31 (62%) were unable to complete the test. 11 (22%) had taken the normal time to complete the task. 8 (16%) had taken 5 min and more, who were considered as the patients with impaired time taken for trail making test.

Category influence test was normal among 41 (82%) of the patients and the rest 9 (18%) had impaired test outcome.

Disability assessment had been conducted using Indian Disability Evaluation Assessment Scale (IDEAS). Out of 50 cases, 24 (48%) of them had moderate quantified disability followed by 16 (32%) with mild and the rest 10 (20%) with severe disability.

PANSS score had significant positive association with category fluency test with the p value of <0.001 but there was moderate association observed with trail making test, digital symbol test and IDEAS score. Although the difference was clinically significant, only moderate significance on statistical analysis was proved. This indicates that category fluency test could obtain us the better assessment compared to other but, not negligible.

Similar to our outcome, Grover et al also had observed that all item scores including total and global IDEAS scores correlated significantly with the positive, negative and general sub-scales, and total PANSS scores.[64] Also, another clinical study by Velligan DI et al also reported that brief cognitive assessment provided the prominent functional outcome among the patients with schizophrenia.[65]

Limitations of The Study

1.Educational background of subjects and difficulty in understanding the test maybe a limiting factor in this study

2.Small sample size was analysed

3.It is Hospital based cross sectional study

4.Varying duration of symptoms maybe another factor affecting the study.

5. 3 patients being above 60 years may compound the findings with normal aging/impending dementia.

Conclusion

Average age of the study population was 38.5±7.8 years with Male predominance. There was significant positive association of PANSS score had with category fluency test with the p value of <0.001 but there was moderate association observed with trail making test, digital symbol test and IDEAS score. Although the difference was clinically significant, only moderate significance on statistical analysis was proved. This indicates that category fluency test could obtain us the better assessment compared to other but, not negligible.

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