Journal of Chemical Health Risks

www.jchr.org

JCHR (2025) 15(1), 970-975 | ISSN:2251-6727

Cognitive Impairment in Clinically Stable Patients with Schizophrenia: A Cross-Sectional Study from a Teaching Hospital Eastern UP

Dr. Vinod Verma,[1] Dr. Sandeep Kumar,[2] Dr. Chandan Kumar Sah, [3] Dr.Ajeet Kumar,[4] Dr. Shobhit Jain[5] , Dr. Pradeep Kumar[6*]

[1]Assistant Professor, Department of Psychiatry, Uma Nath Singh Autonomous State Medical College, Jaunpur, Uttar Pradesh, India

[2]Senior Resident, Department of Psychiatry, Uma Nath Singh Autonomous State Medical College, Jaunpur, Uttar Pradesh, India

[3]Senior Resident,Department of Psychiatry, Indira Gandhi Institute of Medical Sciences, Patna, Bihar, India

[4]Assistant Professor, Department of Psychiatry, Baba Raghav Das Medical College, Gorakhpur, Uttar Pradesh, India

[5]Associate Professor,Department of Psychiatry, Baba Kinaram Autonomous State Medical Collage Chandauli, Uttar Pradesh, India

[6]Assistant Professor,Department of Psychiatry, Maharshi Viswamitra Autonomous State Medical College Ghazipur, Uttar Pradesh, India

Corresponding Author: Dr.Pradeep Kumar

(Received: 20 December 2024. Revised: 23 January 2025 Accepted: 18 February 2025)

KEYWORDS

BPRS, ACE-III, Cognitive Impairment, Schizophrenia

ABSTRACT:

Introduction: Over the past two decades, research on schizophrenia has extensively focused on cognitive impairment, its impact on daily functioning, and overall disease outcomes.

Aim and Objective: The study aims to evaluate cognitive deficits across five domains—Attention, Memory, Fluency, Language, and Visuospatial abilities—in young adults diagnosed with schizophrenia and compare them with a control group matched for age, sex, and education.

Methods: A total of 50 participants with schizophrenia were recruited from the psychiatric outpatient department (OPD), while 50 control participants were selected from the general population. Both groups underwent screening based on inclusion and exclusion criteria. The Brief Psychiatric Rating Scale (BPRS) and Addenbrooke's Cognitive Examination-III (ACE-III) were administered, and the data were analysed using SPSS software version 23.0.

Results: The study revealed a significant difference in ACE-III scores between the schizophrenia and control groups (84% vs. 100%, p=0.003), with schizophrenia patients showing a decline across all cognitive domains compared to controls (p<0.000). The mean scores in the schizophrenia and control groups, respectively, were as follows: Attention (14.22 vs. 16.38), Memory (24.14 vs. 25.04), Fluency (12.92 vs. 13.64), Language (24.22 vs. 25.46), Visuospatial abilities (14.14 vs. 15.28), and the overall ACE-III score (89.92 vs. 95.86). Additionally, cognitive decline was observed in the total ACE-III score based on the duration of illness (<1 year, 1–5 years, and >5 years), which was statistically significant (91.47 vs. 90.15 vs. 86.82, p=0.000).

Conclusion: These findings highlight the need for greater attention to cognitive impairments in schizophrenia. Implementing routine cognitive assessments during initial evaluations and follow-up appointments may help in early detection and management, ultimately improving patient outcomes.

Journal of Chemical Health Risks

www.jchr.org

JCHR (2025) 15(1), 970-975 | ISSN:2251-6727

INTRODUCTION:

Schizophrenia is a severe mental disorder and it affects approximately 20 million people worldwide [1]. It ranks as the third leading cause of morbidity among individuals aged 15–44 globally [2]. Research has consistently shown that schizophrenia is associated with cognitive deficits across multiple domains [3]. Patients with schizophrenia tend to perform worse than healthy controls in areas such as attention, memory, executive functioning, language, learning, and motor control [4-6].

In recent years, cognitive impairment has become a focal point in understanding the etiology and treatment approaches for schizophrenia [7]. While extensive research on cognitive deficits in schizophrenia has been conducted in developed countries—where outcomes appear to be less favourable—comparatively fewer studies have been conducted in developing nations such as India. Understanding the extent and nature of cognitive dysfunction in Indian patients with schizophrenia is crucial. Existing studies in India have documented cognitive impairments in schizophrenia [8-9]; however, a comprehensive analysis covering all major cognitive domains and their association with demographic and clinical variables remains limited.

AIM:

This study aims to assess cognitive deficits across five key cognitive domains—Attention, Memory, Fluency, Language, and Visuospatial abilities—in young adult patients with schizophrenia, comparing them with a control group matched for age, sex, and education. Additionally, we examine how the duration of illness correlates with cognitive functioning in schizophrenia patients.

MATERIALS AND METHODS:

Study Design:

This study was a cross-sectional, hospital-based comparative study conducted in the Psychiatry Department of Uma Nath Singh Autonomous State Medical College, Jaunpur, Uttar Pradesh, India. The research was carried out from October 1, 2023, to September 30, 2024, following ethical approval from the institution's Ethics Committee. The study sample consisted of 50 individuals diagnosed with schizophrenia and 50 control subjects. Control participants were selected from individuals accompanying patients in the outpatient department (OPD), ensuring they were not related to the patients. Participants were included in the study based on predefined inclusion and exclusion criteria, and data were collected using a convenience sampling method.

Ethical Considerations:

Ethical approval was obtained from Uma Nath Singh Autonomous State Medical College, Jaunpur. Informed consent was secured from all participants before data collection, and strict measures were taken to protect their privacy and confidentiality throughout the study.

Inclusion Criteria:

Participants were required to be between 16 and 40 years old, have had schizophrenia for more than six months, and possess a minimum education level of the tenth grade. The written informed consent was obtained from all the participants.

Control Group:

A total of 50 healthy control participants were selected from patient attendants, ensuring they were matched to the schizophrenia group based on age, gender, and education level.

Exclusion Criteria:

Individuals with co-existing physical, organic, or other psychotic disorders were excluded from the study. Additionally, patients with a Brief Psychiatric Rating Scale (BPRS) score greater than 30 were excluded to rule out those experiencing acute schizophrenia symptoms.

Instruments and Tools:

- **Sociodemographic Proforma:** Data on age, sex, religion, marital status, education, occupation, monthly income, and domicile were collected using a semi-structured questionnaire designed for the study.
- **Clinical Profile Sheet:** This was used to document the clinical symptoms of study participants.
- **Addenbrooke's Cognitive Examination III (ACE-III)[10] :** The ACE-III is a cognitive assessment tool primarily used for detecting dementia. However, research has demonstrated its effectiveness in screening cognitive deficits in schizophrenia [11] . It evaluates five cognitive domains with maximum scores as follows:

Journal of Chemical Health Risks

www.jchr.org

JCHR (2025) 15(1), 970-975 | ISSN:2251-6727

attention (18), memory (26), fluency (14), language (26), and visuospatial abilities (16). The total possible score is 100.

- **Brief Psychiatric Rating Scale (BPRS)[12] :** This 18-item scale was used to assess schizophrenia symptoms and exclude patients with acute symptoms. It evaluates positive symptoms, general psychopathology, and affective symptoms.

Method:

Participants were screened in the psychiatry OPD, and those meeting the ICD-10 diagnostic criteria for schizophrenia were selected. The sample was divided into case and control groups. After fulfilling the inclusion and exclusion criteria, eligible participants were assessed using the BPRS and ACE-III scales.

Statistical Analysis:

Data were analysed using SPSS version 23.0 for Windows. Both parametric and non-parametric statistical tests were applied where appropriate. A p-value of <0.05 was considered statistically significant.

RESULTS:

A total of 100 participants were included in the study, with 50 in the schizophrenia group and 50 in the control group. The mean age of participants in the case group was 31 years, while in the control group, it was 27 years (p = 0.026). Males were predominant in both groups, accounting for 60% in the case group and 72% in the control group.

Among the case and control groups, the proportions of married participants were 56% and 32%, respectively. Rural background was reported in 58% of schizophrenia patients and 56% of controls. The majority of participants identified as Hindu (82% in the case group and 88% in the control group). Nuclear family structures were observed in 72% of schizophrenia patients and 64% of controls. Students comprised 32% of both groups. In terms of socioeconomic status, 76% of the schizophrenia group and 90% of the control group belonged to the middle class.

Substance use was reported in 20% of schizophrenia patients and 12% of control participants, while a family history of psychiatric illness was present in 30% of cases and 18% of controls. Notably, there was a statistically significant difference in family support between the patient and control groups (84% vs. 100%, p = 0.003) (Table 1).

Table 1: Socio-demographic profile of participants		**Case (n=50)**		**Control (n=50)**		**p-value**
		N	**%**	**N**	**%**	
Mean age in years (SD)		31.540 ± 9.1053		27.5200 ± 8.6265		*0.026*
Sex- male		30	60	36	72	0.205
Marital status	married	28	56	16	32	*0.016*
	Single	22	44	34	68	
Religion	Hindu	41	82	44	88	0.401
	Muslim	9	18	6	12	
Residence	Rural	29	58	28	56	0.840
	Urban	21	42	22	44	
Type of family- Nuclear		36	72	32	64	0.391
Education	High school	21	42	17	34	0.699
	Intermediate	20	40	22	44	
	Graduation	9	18	11	22	
Socio-economic status	Upper middle	10	20	15	30	0.139
	Lower middle	28	56	30	60	
	Upper lower	12	24	5	10	

Journal of Chemical Health Risks
www.jchr.org
JCHR (2025) 15(1), 970-975 | ISSN:2251-6727

Occupation	Unemployed	2	4	10	20	0.051
	Student	16	32	16	32	
	Housewife	11	22	10	20	
	Farmer	11	22	6	12	
	Skilled worker	6	12	1	2	
	Shop keeper	4	8	5	10	
	Professional	0	0	2	4	
Substance abuse- present		10	20	6	12	0.275
Family history of Psychiatric illness - present		15	30	9	18	0.160
Family support - Present		42	84	50	100	*0.003*

A statistically significant difference in ACE-III scores was observed between the schizophrenia and control groups, with normal subjects scoring 84% compared to 100% in the control group (p = 0.003). Additionally, a significant decline was noted across all cognitive domains of ACE-III in the schizophrenia group compared to controls (p < 0.000). The mean scores for the schizophrenia and control groups, respectively, were as follows: Attention (14.22 vs. 16.38), Memory (24.14 vs. 25.04), Fluency (12.92 vs. 13.64), Language (24.22 vs. 25.46), and Visuospatial abilities (14.14 vs. 15.28). The total ACE-III score was also lower in the schizophrenia group (89.92) compared to the control group (95.86) (Table 2).

Table 2: Domain wise Cognitive characteristics of patients and control subjects.		**Case (n=50)**		**Control (n=50)**		**p-value**
ACE-III	Normal (>87)	42	84%	50	100%	*0.003*
	Inconclusive (83-87)	8	16%	0	0%	
	Abnormal (<83)	0	0%	0	0%	
Attention (-/18)		14.2200 ±1.41839		16.3800 ±1.02798		*0.000*
Memory (-/26)		24.1400 ±.98995		25.0400 ±.69869		*0.000*
Fluency (-/14)		12.9200 ±.80407		13.6400 ± .48487		*0.000*
Language (-/26)		24.2200 ±1.70581		25.4600 ±.57888		*0.000*
Visuospatial (-/16)		14.1400 ±.85738		15.2800 ±.67128		*0.000*
Total ACE-III (-/100)		89.9200 ±3.20612		95.8600 ±2.48267		*0.000*

A significant decline in cognitive function, as measured by the total ACE-III score, was observed with increasing duration of illness (<1 year, 1–5 years, and >5 years), with scores of 91.47, 90.15, and 86.82, respectively (p = 0.000). A statistically significant decrease was also noted in the domains of Attention (14.58 vs. 14.40 vs. 13.27, p = 0.036), Fluency (13.32 vs. 12.80 vs. 12.45, p = 0.010), and Visuospatial abilities (14.58 vs. 13.90 vs. 13.82, p = 0.014) as the duration of illness increased. However, while there was a decline in Memory (24.32 vs. 24.30 vs. 23.54, p = 0.076) and Language (24.53 vs. 24.05 vs. 24.00, p = 0.618), these differences were not statistically significant (Table 3).

Journal of Chemical Health Risks

www.jchr.org

JCHR (2025) 15(1), 970-975 | ISSN:2251-6727

Table 3: Domain-wise cognitive impairment with duration of illness of Schizophrenia subject	< 1 year (N=19)	1-5 year (N=20)	>5 years (N=11)	p-value
Attention (-/18)	14.5789±1.60955	14.4000 ±1.23117	13.2727±1.00905	*0.036*
Memory (-/26)	24.3158 ±.94591	24.3000 ±1.08094	23.5455 ±.68755	0.076
Fluency (-/14)	13.3158 ±.74927	12.8000 ±.76777	12.4545 ±.68755	*0.010*
Language (-/26)	24.5263 ±.77233	24.0500 ±2.54383	24.0000 ±.77460	0.618
Visuospatial (-/16)	14.5789 ±.50726	13.9000 ±.96791	13.8182 ±.87386	*0.014*
Total ACE-III (-/100)	91.4737 ±3.35606	90.1500 ±2.47673	86.8182 ±1.77866	*0.000*

DISCUSSION:

In our study, the schizophrenia group had a mean age of 31 years, with a predominance of male participants (60%), married individuals (56%), rural backgrounds (58%), nuclear families (72%), and middle-class socioeconomic status (76%). These findings are consistent with a study conducted in Vadodara by Talreja et al. (2018), which reported a mean age of 33.96 years, with 54% male participants, 53% married individuals, 44% from rural backgrounds, and 64% from lower socioeconomic status [(13)].

A statistically significant difference was observed in ACE-III scores between the schizophrenia and control groups (84% vs. 100%, p = 0.003). Additionally, significant cognitive decline was noted across all ACE-III domains in schizophrenia patients compared to controls (p < 0.000). The mean scores for the schizophrenia and control groups, respectively, were as follows: Attention (14.22 vs. 16.38), Memory (24.14 vs. 25.04), Fluency (12.92 vs. 13.64), Language (24.22 vs. 25.46), and Visuospatial abilities (14.14 vs. 15.28). The total ACE-III score was lower in the schizophrenia group (89.92) compared to the control group (95.86). These findings align with research by Uppinkudru et al. (2023), which also reported significant cognitive impairment in schizophrenia patients across all ACE-III domains, with mean scores of Attention (14.95), Memory (18.42), Fluency (8.19), Language (23.66), and Visuospatial abilities (14.1), along with a total ACE-III score of 79.17 [(14)].

Furthermore, our study identified a significant decline in cognitive function as the duration of illness increased (<1 year, 1–5 years, and >5 years), with total ACE-III scores of 91.47, 90.15, and 86.82, respectively (p = 0.000). A statistically significant decline was also noted in the domains of Attention (14.58 vs. 14.40 vs. 13.27, p = 0.036), Fluency (13.32 vs. 12.80 vs. 12.45, p = 0.010), and Visuospatial abilities (14.58 vs. 13.90 vs. 13.82, p = 0.014) over time. These findings are supported by a study conducted in Sri Lanka by Goonathilake et al. (2022), which also found a negative correlation between cognitive performance and illness duration [(15)].

Strengths of the Study:

One of the primary strengths of this study is the use of standardized and well-recognized assessment tools (BPRS and ACE-III). Additionally, the study was conducted by a single investigator, minimizing potential bias. The study's objectives and research questions were clearly defined, ensuring a focused and structured approach.

Limitations of the Study:

- This study was cross-sectional; longitudinal studies are needed to further investigate the trajectory of cognitive decline.
- Participants included were those receiving regular medication or follow-up care, making it difficult to isolate the effects of medication on cognitive function.
- Since participants were recruited from outpatient clinics, patients with more severe negative symptoms, lower functional levels, poor medication

Journal of Chemical Health Risks

www.jchr.org

JCHR (2025) 15(1), 970-975 | ISSN:2251-6727

adherence, and irregular clinic attendance may not have been adequately represented.

CONCLUSION:

Patients with chronic schizophrenia exhibit impairments in processing speed across multiple cognitive domains, including attention, memory, fluency, language, and visuospatial abilities, compared to healthy controls. Additionally, deficits in attention, memory, and visuospatial cognition appear earlier as the duration of illness progresses. Cognitive impairment in schizophrenia remains a critical area of research due to its significant impact on patient well-being and daily functioning.

Recognizing and addressing these cognitive deficits is essential for providing comprehensive care. Clinicians should be mindful of these impairments to better meet the needs of patients and caregivers. These findings highlight the necessity of integrating routine cognitive assessments into both initial evaluations and ongoing patient reviews. Early detection of cognitive dysfunction is increasingly recognized as a key component in managing schizophrenia effectively.

Currently, in many psychiatric settings especially in developing countries like India cognitive assessment is often overlooked. A lack of focus on cognitive deficits, possibly due to therapeutic nihilism, may contribute to this gap in care. Implementing cognitive rehabilitation programs at an early stage could significantly help mitigate the long-term impact of these impairments, ultimately improving patient outcomes.

REFERENCES:

1. James SL, Abate D, Abate KH, Abay SM, Abbafati C, Abbasi N, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 354 Diseases and Injuries for 195 countries and territories, 1990–2017: A systematic analysis for the Global Burden of Disease Study 2017. Lancet. 2018;392:1789–858.
2. Hegarty JD, Baldessarini RJ, Tohen M, Waternaux C, Oepen G. One hundred years of schizophrenia: A meta-analysis of the outcome literature. Am J Psychiatry. 1994;151:1409–16
3. Sharma T, Antonova L: Cognitive function in schizophrenia Deficits, functional consequences, and future treatment. Psychiatr Clin N Am 2003, 26:25-40.
4. Braff DL. Psychophysiological and information processing approaches to schizophrenia. In: Charney DS, Nestler E, Bunney BS, editors. *Neurobiological foundation of mental illness.* New York: Oxford University Press; 1999. pp. 258–327.
5. Rund BR, Borg NE. Cognitive deficits and cognitive training in schizophrenic patients: A review. *Acta Psychiatr Scand.* 1999;100:85–95.
6. Green MF, Kern RS, Braff DL, et al. Neurocognitive deficits and functional outcome in schizophrenia: Are we measuring the 'right stuff'? *Schizophr Bull.* 2000;26:119–36.
7. Harvey PD, Bowie CR, Friedman JI. Cognition in schizophrenia. *Curr Psychiatr Rep.* 2001;3:423–8.
8. Ananthanarayanan CV, Janakiramaiah N, Gangadhar BN, et al. Visual information processing deficits in clinically remitted outpatient schizophrenics. *Indian J Psychiatry.* 1993;35:27–30.
9. John PJ, Khanna S, Mukundan CR, et al. Relationship between psychopathological dimensions and performance on frontal lobe tests in schizophrenia. *Indian J Psychol Med.* 2001;24:19–26
10. Noone P. Addenbrooke's cognitive examination-III. Occup Med. 2015;65:418–20
11. Charernboon T, Chompookard P. Detecting cognitive impairment in patients with schizophrenia with the Addenbrooke's cognitive examination. Asian J Psychiatr. 2019;40:19–2
12. Overall JE, Gorham DR. The brief psychiatric rating scale. Psychological reports. 1962 Jun;10(3):799-812.
13. Talreja BT, Shah S, Kataria L. Cognitive function in schizophrenia and its association with socio-demographics factors. Industrial psychiatry journal. 2013 Jan 1;22(1):47-53.
14. Uppinkudru C, Gopalakrishnan R, Noel J, Kuruvilla A. Prevalence, correlates and explanatory models of cognitive deficits in patients with schizophrenia—A cross sectional study. Indian Journal of Psychiatry. 2023 Oct 1;65(10):1025-34.
15. Goonathilake P, Ediriweera D, Ruban R, Isuru A. Prevalence and correlates of cognitive impairment in schizophrenia: a cross-sectional study from a teaching hospital southern Sri Lanka. BMC psychiatry. 2022 Nov 17;22(1):716.