

Cognitive Impairment in Schizophrenia: Prevalence and Domain-Specific Deficits Among Indonesian Psychiatric Patients

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Abstract

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Background: Cognitive impairment is a core dimension of schizophrenia that significantly contributes to long-term functional disability. Although international evidence indicates a high prevalence of cognitive deficits in schizophrenia, data regarding cognitive domain profiles among clinical populations in Indonesia remain limited. This Study aims to determine the prevalence of cognitive impairment and describe the profile of cognitive domain performance among patients with schizophrenia. **Methods:** This hospital-based cross-sectional study involved 101 patients with schizophrenia (ICD-10 F20) aged ≥ 18 years who were in clinically stable condition. Cognitive function was assessed using the Indonesian version of the Montreal Cognitive Assessment (MoCA-INA). Cognitive impairment was defined as a total MoCA score < 26 , with the standard education correction (+1 point for ≤ 12 years of education) applied. Descriptive analyses were conducted to present total and domain subscale scores as mean $\pm$ standard deviation and percentages of the maximum possible score for each domain. **Results:** The mean age of respondents was 38.72 ± 9.22 years, with a mean duration of illness of 6.61 ± 3.86 years. The mean total MoCA score was 17.17 ± 7.02 . Overall, 92.08% of patients had MoCA scores < 26 (95% CI added: 87.20–96.96%). Domain analysis showed the poorest performance in memory (delayed recall), achieving only 34.26% of the maximum score, followed by abstraction (43.07%) and attention (48.84%). Relatively preserved domains included naming (86.80%) and orientation (73.27%). **Conclusion:** Cognitive impairment was detected in the majority of patients with schizophrenia at Aceh Psychiatric Hospital, with the most prominent deficits observed in memory and higher-order executive functions. These findings highlight the importance of integrating routine cognitive screening into the comprehensive management of patients with schizophrenia.

Keywords: Schizophrenia; Cognitive impairment; Montreal Cognitive Assessment; Cognitive domains; Cross-sectional study

Introduction

Schizophrenia is a severe mental disorder characterized by disturbances in perception, thought, emotion, and persistent behavioral disorganization, resulting in significant disability (McCutcheon, Reis Marques and Howes, 2020; American Psychiatric Association, 2022). In addition to positive and negative symptoms, cognitive impairment is now recognized as a core dimension of schizophrenia that plays a major role in determining long-term functional outcomes (Tripathi, Kar and Shukla, 2018; Green, Horan and Lee, 2019; McCutcheon, Reis Marques and Howes, 2020). Cognitive deficits persist even after psychotic symptoms have been controlled (Green, Horan and Lee, 2019). Therefore, addressing cognitive impairment is essential for improving the overall prognosis and quality of life in patients with schizophrenia.

Recent meta-analyses have demonstrated that neurocognitive impairment is more strongly associated with functional outcomes than positive symptoms and serves as a critical predictor of occupational functioning and social integration among patients with schizophrenia (Green, Horan and Lee, 2019; Iozzino et al., 2021). Impairments in memory and executive functioning have consistently been reported as the most affected domains, associated with abnormalities in prefrontal cortical and hippocampal circuits (Millan et al., 2012; McCutcheon, Reis Marques and Howes, 2020; Iozzino et al., 2021). This highlights the need for routine cognitive evaluation as an integral component of schizophrenia management.

Various instruments have been used to assess cognitive functioning, including comprehensive neuropsychological batteries such as the MATRICS Consensus Cognitive Battery (MCCB) (Nuechterlein et al., 2008). However, routine clinical practice requires brief, practical screening tools with adequate sensitivity. The Montreal Cognitive Assessment (MoCA) (Nasreddine et al., 2005) is a widely used screening instrument that assesses several cognitive domains within approximately 10–15 minutes. The Indonesian version (MoCA-INA) has been culturally adapted and validated (Akbar, Effendy and Camellia, 2019). The MoCA-INA thus offers a feasible option for cognitive screening in Indonesian clinical settings.

Although international research on cognitive impairment in schizophrenia has expanded substantially, empirical data from Indonesia remain limited. In particular, studies describing detailed cognitive domain profiles in Indonesian clinical populations are scarce. This issue is important given that schizophrenia contributes substantially to the global burden of disease and impaired social functioning (Charlson et al., 2018). Therefore, this study aimed to determine the prevalence of cognitive impairment and describe the profile of cognitive domain performance among patients with schizophrenia at Aceh Psychiatric Hospital, to enrich local evidence and support the integration of cognitive screening into routine clinical practice.

Methods

This cross-sectional study was conducted at Aceh Psychiatric Hospital from December 2025 to January 2026. Ethical approval was obtained from the institutional review board of the psychiatric hospital. All participants provided written informed consent prior to enrolment. Participants were patients diagnosed with schizophrenia based on ICD-10 criteria (code F20) and aged ≥ 18 years. Patients were included if they were in clinically stable condition, defined as the absence of acute psychotic symptoms (delusions, hallucinations, or disorganized behavior) for at least two weeks prior to assessment, as determined by the attending psychiatrist. Patients were excluded if they had a history of neurological disorders (e.g., epilepsy, stroke, traumatic brain injury), severe cognitive or communication problems that prevented completion of the assessment, or were experiencing acute psychotic episodes at the time of recruitment. Participants were recruited consecutively during the study period.

Sociodemographic and clinical data were obtained through medical record review and structured interviews, including age, sex, educational level, marital status, employment status, duration of illness, length of hospitalization, type of antipsychotic medication used (atypical vs. others, including typical antipsychotics and combination therapy), and history of substance use. Substance use history was defined as self-reported use of any illicit substances (including cannabis, amphetamines, or opioids) or alcohol in the past 12 months.

Cognitive function was assessed using the Indonesian version of the Montreal Cognitive Assessment (MoCA-INA). The MoCA-INA total score ranges from 0 to 30, with the standard education correction of +1 point applied for participants with ≤ 12 years of formal education (Nasreddine et al., 2005). Cognitive impairment was defined as a total score < 26 . Domain subscale scores analysed included visuospatial/executive function (maximum score 5), naming (maximum 3), attention (maximum 6), language (maximum 3), abstraction (maximum 2), memory/delayed recall (maximum 5), and orientation (maximum 6). To facilitate comparisons across domains, each domain score was converted into a percentage of the maximum possible score for that domain.

Statistical analyses were performed using Stata version 13. Numerical variables were presented as mean $\pm$ standard deviation and range values, while categorical variables were presented as frequencies and percentages. The prevalence of cognitive impairment was calculated as the proportion of patients with total MoCA scores < 26 , with 95% confidence intervals reported. No subgroup or multivariable analyses were performed due to the descriptive nature of the study.

Results

A total of 101 patients diagnosed with schizophrenia (ICD-10 F20) were included in this study. The mean age was 38.72 ± 9.22 years (range: 18–59 years). The mean duration of illness was 6.61 ± 3.86 years, and the mean

length of hospitalization was 67.90 ± 76.10 days. The mean total MoCA score was 17.17 ± 7.02 (range: 0–30). The majority of respondents were male (89.11%), unmarried (71.29%), and unemployed (71.29%). The most common educational level was senior high school (39.60%), followed by junior high school (29.70%) and primary school (23.76%). A history of substance use in the past 12 months was reported by 26.73% of participants. The majority (95.05%) were receiving atypical antipsychotics. Details of demographic, clinical, and cognitive impairment characteristics of participants is presented in Table 1.

Table 1. Demographic, Clinical, and Cognitive Impairment Characteristics of Participants (N=101)

Characteristic	n (%) / Mean $\pm$ SD
Age (years), mean $\pm$ SD (range)	38.72 $\pm$ 9.22 (18–59)
Sex	
Male	90 (89.11%)
Female	11 (10.89%)
Education level	
Primary school	24 (23.76%)
Junior high school	30 (29.70%)
Senior high school	40 (39.60%)
Higher education	7 (6.93%)
Marital status	
Unmarried	72 (71.29%)
Married	24 (23.76%)
Divorced	5 (4.95%)
Employment status	
Unemployed	72 (71.29%)
Employed	29 (28.71%)
Duration of illness (years), mean $\pm$ SD (range)	6.61 $\pm$ 3.86 (1–20)
Length of hospitalization (days), mean $\pm$ SD (range)	67.90 $\pm$ 76.10 (2–390)
History of substance use (past 12 months)	
Yes	27 (26.73%)
No	74 (73.27%)
Main antipsychotic type	
Atypical	96 (95.05%)
Others (typical or combination)	5 (4.95%)
Total MoCA score, mean $\pm$ SD (range)	17.17 $\pm$ 7.02 (0–30)
Cognitive impairment (MoCA <26)	93 (92.08%; 95% CI: 87.20–96.96%)

Using the MoCA cut-off score of <26, 93 patients (92.08%; 95% CI: 87.20–96.96%) were categorized as having cognitive impairment, while 8 patients (7.92%) were classified as cognitively normal. Analysis of domain subscale scores demonstrated variations in impairment across cognitive domains. Memory (delayed recall) was the most impaired domain, with a mean score of 1.71 ± 1.51 out of a maximum of 5 (34.26% of maximum). Abstraction (mean 0.86 ± 0.69 ; 43.07%) and attention (mean 2.93 ± 1.66 ; 48.84%) also showed substantial impairment. The visuospatial/executive domain demonstrated moderate impairment (52.48%). In contrast, orientation (73.27%) and naming (86.80%) were relatively preserved.

Discussion

This study demonstrated a high prevalence of cognitive impairment (92.08%; 95% CI: 87.20–96.96%) among patients with schizophrenia at Aceh Psychiatric Hospital. These findings are consistent with the literature indicating that cognitive impairment is a core and persistent feature of schizophrenia (Tripathi, Kar and Shukla, 2018; Green, Horan and Lee, 2019; McCutcheon, Reis Marques and Howes, 2020; Peng et al., 2021). The observed prevalence is comparable to international studies reporting cognitive deficits in 75–95% of patients with schizophrenia (Schaefer et al., 2013). This confirms that cognitive impairment is a near-universal feature in this population and underscores the urgency of integrating cognitive screening into routine psychiatric care in Indonesia.

The most prominent finding was the severe impairment in memory (delayed recall), which achieved only 34.26% of the maximum score. This is consistent with evidence that episodic memory deficits and dysfunction within hippocampal–prefrontal circuits are key neurobiological characteristics of schizophrenia (Millan et al., 2012; Harvey and Rosenthal, 2018; McCutcheon, Reis Marques and Howes, 2020). The substantial deficits in abstraction (43.07%) and attention (48.84%) further support the vulnerability of higher-order executive functions requiring frontal-temporal network integration (Vita et al., 2012; Green, Horan and Lee, 2019). Conversely, orientation (73.27%) and naming (86.80%) were relatively preserved. This pattern suggests that

basic cognitive functions remain more stable than complex cognitive processes, a finding consistent with systematic reviews indicating that domains requiring prefrontal integration are more vulnerable (Vita et al., 2012; Green, Horan and Lee, 2019). The predominance of memory and executive dysfunction highlights these domains as primary targets for cognitive remediation and functional support interventions in this population.

Table 2. MoCA Domain Subscale Scores

Cognitive Domain	Maximum Score	Mean $\pm$ SD	% of Maximum Score
Visuospatial/Executive	5	2.62 $\pm$ 1.70	52.48%
Naming	3	2.60 $\pm$ 0.88	86.80%
Attention	6	2.93 $\pm$ 1.66	48.84%
Language	3	2.04 $\pm$ 1.07	67.99%
Abstraction	2	0.86 $\pm$ 0.69	43.07%
Memory (Delayed Recall)	5	1.71 $\pm$ 1.51	34.26%
Orientation	6	4.40 $\pm$ 1.78	73.27%

These findings underscore the importance of routine cognitive screening in psychiatric services. Impairments in memory and executive functioning have been strongly associated with limitations in daily functioning, medication adherence, and participation in psychosocial interventions (Green, Horan and Lee, 2019). Recent meta-analyses demonstrate that cognitive remediation interventions significantly improve cognitive performance and functional outcomes in patients with schizophrenia (Vita et al., 2021). Therefore, cognitive screening should become a routine component of schizophrenia assessment, and cognitive remediation interventions should be incorporated into comprehensive management. Integrating the MoCA-INA into standard practice can facilitate early identification of patients who would benefit from targeted cognitive interventions. The MoCA-INA, as a relatively rapid and practical screening instrument, could be integrated into both outpatient and inpatient psychiatric services to identify patients requiring further neuropsychological evaluation.

Limitations

This study has several limitations. First, the cross-sectional design does not allow causal inferences. Second, the use of the standard MoCA cut-off score of <26 may result in overestimation of prevalence among participants with lower educational levels, despite the application of the education correction. However, the pattern of domain deficits remains valid, as comparisons across domains were conducted within the same participants. Third, psychotic symptom severity and social functioning were not assessed, both of which may interact with cognitive performance. Fourth, the study was conducted at a single centre, limiting generalizability. Future research should employ longitudinal designs and include assessments of symptom severity and functional outcomes.

Conclusion

Cognitive impairment was highly prevalent among patients with schizophrenia at Aceh Psychiatric Hospital, with dominant deficits in memory and executive functioning. Integration of cognitive assessment into routine clinical practice is recommended to support comprehensive patient management.

Statements

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Ethical approval: This study was approved by the Ethics Committee of psychiatric hospital. Written informed consent was obtained from all participants or the caregivers. All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments. Participants were informed about the purpose of the study, the procedures involved, and their right to withdraw at any time without consequences. The confidentiality and anonymity of all participants were maintained throughout the study.

Data Availability: The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request, subject to applicable ethical and institutional restrictions.

Conflict of Interest: The authors declare that they have no conflicts of interest.

CRedit role of authors: All authors contributed to this work according to the CRediT (Contributor Roles Taxonomy) system as follows: **Juwita Saragih:** Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Writing – review & editing, Supervision, Project administration. **Liza Fathiariani:** Conceptualization, Methodology, Investigation, Data curation, Writing – review & editing. **Agustina:** Investigation, Data curation, Writing – review & editing. **Hedya Nadhrati Surura:** Investigation, Data curation, Writing – review & editing. **Eka Arianti:** Investigation, Data curation, Writing – review & editing. **Husna Islahuddin:** Investigation, Data curation, Writing – review & editing. **Fitri Tilawah:** Investigation, Data curation, Writing – review & editing.

References

- Akbar, N.L., Effendy, E. and Camellia, V. (2019) 'The Indonesian Version of Montreal Cognitive Assessment (MoCA-Ina): The Difference Scores Between Male Schizophrenia Prescribed by Risperidone and Adjunctive of Donepezil in Public Hospital of Dr Pirngadi Medan, Indonesia', *Open Access Macedonian Journal of Medical Sciences*, 7(11), p. 1762. Available at: <https://doi.org/10.3889/oamjms.2019.461>.
- American Psychiatric Association (2022) 'Diagnostic and Statistical Manual of Mental Disorders', *Diagnostic and Statistical Manual of Mental Disorders* [Preprint]. Available at: <https://doi.org/10.1176/appi.books.9780890425787>.
- Charlson, F.J. et al. (2018) 'Global epidemiology and burden of schizophrenia: findings from the Global Burden of Disease Study 2016', *Schizophrenia Bulletin*, 44(6), pp. 1195-1203. Available at: <https://doi.org/10.1093/schbul/sby058>
- Green, M.F., Horan, W.P. and Lee, J. (2019) 'Nonsocial and social cognition in schizophrenia: current evidence and future directions', *World Psychiatry*, 18(2), pp. 146-161. Available at: <https://doi.org/10.1002/wps.20624>.
- Harvey, P.D. and Rosenthal, J.B. (2018) 'Cognitive and functional deficits in people with schizophrenia: Evidence for accelerated or exaggerated aging?', *Schizophrenia research*, 196, pp. 14-21. Available at: <https://doi.org/10.1016/J.SCHRES.2017.05.009>.
- Iozzino, L. et al. (2021) 'Neurocognition and social cognition in patients with schizophrenia spectrum disorders with and without a history of violence: results of a multinational European study', *Translational Psychiatry* 2021 11:1, 11(1), pp. 620-. Available at: <https://doi.org/10.1038/s41398-021-01749-1>.
- McCutcheon, R.A., Reis Marques, T. and Howes, O.D. (2020) 'Schizophrenia—An Overview', *JAMA Psychiatry*, 77(2), p. 201. Available at: <https://doi.org/10.1001/jamapsychiatry.2019.3360>.
- Millan, M.J. et al. (2012) 'Cognitive dysfunction in psychiatric disorders: characteristics, causes and the quest for improved therapy', *Nature reviews. Drug discovery*, 11(2), pp. 141-168. Available at: <https://doi.org/10.1038/nrd3628>.
- Nasreddine, Z.S. et al. (2005) 'The Montreal Cognitive Assessment, MoCA: A brief screening tool for mild cognitive impairment', *Journal of the American Geriatrics Society*, 53(4), pp. 695-699. Available at: <https://doi.org/10.1111/j.1532-5415.2005.53221.x>.
- Nuechterlein, K.H. et al. (2008) 'The MATRICS consensus cognitive battery, part 1: Test selection, reliability, and validity', *American Journal of Psychiatry*, 165(2), pp. 203-213. Available at: <https://doi.org/10.1176/appi.ajp.2007.07010042>.
- Peng, X.J. et al. (2021) 'The Association Between Cognitive Deficits and Clinical Characteristic in First-Episode Drug Naïve Patients With Schizophrenia', *Frontiers in Psychiatry*, 12, p. 638773. Available at: <https://doi.org/10.3389/fpsy.2021.638773>.
- Schaefer, J. et al. (2013) 'The global cognitive impairment in schizophrenia: consistent over decades and around the world', *Schizophrenia research*, 150(1), pp. 42-50. Available at: <https://doi.org/10.1016/j.schres.2013.07.009>.
- Tripathi, A., Kar, S.K. and Shukla, R. (2018) 'Cognitive Deficits in Schizophrenia: Understanding the Biological Correlates and Remediation Strategies', *Clinical psychopharmacology and neuroscience: the official scientific journal of the Korean College of Neuropsychopharmacology*, 16(1), pp. 7-17. Available at: <https://doi.org/10.9758/CPN.2018.16.1.7>.
- Vita, A. et al. (2012) 'Progressive loss of cortical gray matter in schizophrenia: a meta-analysis and meta-regression of longitudinal MRI studies', *Translational Psychiatry*, 2(11), p. e190. Available at: <https://doi.org/10.1038/tp.2012.116>.
- Vita, A. et al. (2021) 'Effectiveness, Core Elements, and Moderators of Response of Cognitive Remediation for Schizophrenia: A Systematic Review and Meta-analysis of Randomized Clinical Trials', *JAMA*

Saragih et al. AJPHN 2026; 3:2 - <https://doi.org/10.62377/wbhkbq81> e-ISSN: 3064-0008
Psychiatry, 78(8), pp. 848–858. Available at: <https://doi.org/10.1001/jamapsychiatry.2021.0620>.

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