



# Cognitive Profile of Patients with Schizophrenia in North Sumatera Indonesia

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## Abstract

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**BACKGROUND:** Cognitive dysfunction is one of the characteristics of schizophrenia traditionally experienced by elderly patients. In the past 25 years, studies have proven that the cognitive dysfunction is an early characteristic of this disease, besides introversion, drug abuse, suicidal behavior, and depressive symptoms. The mini-mental state examination is a test designed to identify functional and organic disorders in psychiatric patients. North Sumatera is often considered as "small Indonesia" due to the variety of tribes live in the province; therefore, a study in relation with the cognitive profile of patients with schizophrenia (PwS) is needed.

**AIM:** We aimed to analyze cognitive function in PwS in the North Sumatera.

**METHODS:** The study was a descriptive study with a cross-sectional approach of cognitive profile of PwS stressing in the age, sex, education, and illness duration of the patients.

**RESULTS:** The results of the study using 200 subjects found that the most affected gender were male (62.5%), between the ages of 25–34 years (46%), with secondary school education background (55.5%), and with an illness duration >1 year (64.0%). The results showed that cognitive function in schizophrenic patients was probable cognitive dysfunction (56.5%).

**CONCLUSIONS:** From the results of this study, it was found that the most affected subjects were men, between 25 and 34 years, with high school education, and the illness lasted more than 1 year. Most of the schizophrenic patients experienced probable cognitive dysfunction.

## Background

Schizophrenia is a severe psychiatric disorder with a multifactorial and complex etiology. The prevalence of schizophrenia is around 1% worldwide. This disorder usually appears on younger patients, though it is likely to appear on to all ages. Women and men stand the same chance of contacting this disease, though men tend to have onset earlier than women. The initial age for patients suffering from schizophrenics was between 10 and 25 years for men, and 25 and 35 years for women. However, the current study has it that about 90% of patients receiving schizophrenia treatment are between the ages of 15 and 55 years of age [1].

Schizophrenia has a characteristic deficit in executive, memory, and general intellectual functions [2]. Some contrasting opinions about cognitive function in schizophrenia still exist. The first opinion suggests that cognitive deficits become progressively worse during the duration of the disease. As the symptom gradually develops, the patient's intellectual function weakens, and they become socially abusive. The second opinion suggests that once the cognitive deficits appear, they will be relatively stable [3].

The mini-mental state examination (MMSE) was originally designed to provide a brief and standardized assessment of mental status that can distinguish between functional and organic disorders in psychiatric patients. Over the years, there has been an increase in the test experience; however, its recent main function is to detect and track the progression of cognitive function associated with neurocognitive disorders [4]. The previous studies proved that MMSE itself was used in the measurement of patients with schizophrenia (PwS) in the United States of America, Singapore, and other countries due to its short administration time and available in validated many languages [5]. The analysis of cognitive function in PwS has been frequently carried out in various parts of the world, and thus, due to the varieties of tribes in the North Sumatera, a study should be done as a specific study of its own.

## Methods

This study was a descriptive study which uses a cross-sectional approach [6] to determine the profile of cognitive function in PwS in North

Sumatera Indonesia. The study subjects consisted of schizophrenic patients diagnosed according to the 10<sup>th</sup> edition of the International Classification of Disease and Related Health Problems (ICD-10). The diagnosis was made by a psychiatrist (MMA), and his colleagues (EE), and (BL) before the fulfillment of inclusion and exclusion criteria.

The study made use of the following inclusion criteria: (1) Outpatient schizophrenic who met the diagnostic criteria for ICD-10, (2) patients between the ages of 15–55 years old, (3) cooperative and interview-able patients, (4) those capable of speaking the Indonesian language, (5) patients who must have at least graduated from primary school, and (6) those willing to participate in the study, confirmed by signing consent to participate in the study both by subjects and their families, while the exclusion criteria used in carrying out this study were as follows: (1) Schizophrenic patients with comorbid diabetes mellitus and (2) patients with a history of stroke, transient ischemic attack, epilepsy, and Parkinson's disease. We used the Indonesian version of MMSE that validated by Psychogeriatric Section on Psychogeriatric of Indonesian Psychiatric Association; they divided the results of it into three categories: (1) Normal, (2) probable cognitive disorder, and (3) definite cognitive disorder, with the scores of 25–30 for normal, 18–24 for a probable cognitive disorder, and 0–17 for a definite cognitive disorder, respectively. The study was done after the authors were granted ethical clearance from the Health Ethical Commission of the Faculty of Medicine, Universitas Sumatera Utara. All of the subjects that met the inclusion and exclusion criteria would undergo the MMSE by MMA and EE to determine their cognitive level.

## Results

### **Characteristics of gender, age, educational background, and illness duration**

From Table 1, it can be observed that men were more prone to this disease (62.5%), with an age range

**Table 1: Characteristics of gender, age, educational background, and illness duration**

Respondents characteristic	n	%
Gender		
Men	125	62.5
Women	75	37.5
Age		
15–24 years old	18	9.0
25–34 years old	92	46.0
35–44 years old	66	33.0
45–55 years old	24	12.0
Background		
Primary school	20	10.0
Secondary school	161	80.5
University	19	9.5
Illness duration (year)		
≤1	72	36.0
>1	128	64.0

of 25–34 years (46%), secondary school education background (80.5%), and an illness duration >1 year (64.0%).

### **Cognitive function in schizophrenic patients**

Table 2 showed that cognitive function in most schizophrenic patients was probable cognitive disorder (56.5%).

**Table 2: Cognitive function in schizophrenic patients**

MMSE-scoring	n	%
Normal	61	30.5
Probable cognitive disorder	113	56.5
Definite cognitive disorder	26	13.0

## Discussion

A descriptive study with cross-sectional studies was used in carrying out this study. The results of the study using 200 subjects found that the most affected gender were male (62.5%), between the ages of 25 and 34 years (46%), with secondary school education background (80.5%), and with an illness duration >1 year (64.0%). Similar results were also found in the studies carried out by Kelly *et al.* [7], which found men to be the most affected. Talreja *et al.* [8] also found that every 100 schizophrenic subjects, 84% had cognitive dysfunction. In MMSE-scoring, when the total score is below 24, it should be considered as having probable cognitive dysfunction [9]. This study found that cognitive function in schizophrenic patients was probably cognitive impairment (56.5%), with a score range of 17–23. It is in line with the statement that schizophrenic patients have intellectual retentive abilities, even though certain cognitive deficits are likely to develop later [10]. Almost similar results were found in studies conducted by Fisekovic *et al.* [11], which found that MMSE scores in PwS were  $24.9 \pm 3.3$  compared with our findings.

Age is considered to affect the cognitive dysfunction in schizophrenia, PwS was shown to have a deteriorated cognitive with increasing age compared to control [12]. In relation to sex, male PwS was found to experience serious cognitive deficits than female PwS [13]. The female PwS experienced better in immediate and delayed memory test [14]. These findings were supported by a study that was done, Zhang *et al.*, as well [15]. According to a literature review made by Antonova *et al.* [16], the cognitive dysfunction in PwS was closely related to a decrease in gray matter density, temporal, and frontal lobe volume. Another research that supports this analysis was the study of Geisler *et al.* [17], which found that gray matter structure also had a relationship with cognitive dysfunction in people with schizophrenia. Some of the things that influence cognitive

dysfunction in PwS include episodes of illness [18] and Estrogen [19]. Cognitive dysfunction in schizophrenia also prolongs the duration of the disease, worsens social functions, and increases the rate at which patients are being hospitalized [20], and the longer duration of the illness will show more cognitive dysfunction [8].

The limitations of this study include the lack of research comparison of cognitive dysfunction between men and women living with schizophrenia, which was done in the ward setting and the use of MMSE instrument. The MMSE instrument is not specifically designed for people with schizophrenia. Thus, in the future, we need a better instrument that is designed to screen cognitive dysfunction in schizophrenia, specifically.

## Conclusions

Schizophrenia is a mental illness, one of which causes a decline in cognitive function in patients. Cognitive functions are needed to work on tasks given, such as communicating and interacting with others, and in carrying out daily activities. Until now, there has not been a study to know exactly what causes schizophrenia and cognitive decline. However, it has been thought that several parts of the brain play a role in this matter.

For patients living with schizophrenia and who experience cognitive dysfunction, it is advisable to get additional therapy other than the medicines they consumed, as this would improve their cognitive function. Some therapies that can be done are cognitive remediation therapy and cognitive behavioral therapy, though these therapies do not have satisfactory results. Further, understanding and study are needed to find the exact cause and the right therapy to improve it.

## Authors' Contributions

All authors contributed equally to this work.

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