Correlation among personal, social performance and cognitive impairment in male schizophrenic patient

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Abstract. Schizophrenia is a dramatic mental illness with tragic manifestation. The consequences of the illness are for the individual, affected his or her family and society. Schizophrenia is one of the twenty illness that causes Years Lost due to Disability. Treating only the symptom is insufficient. The aim of treatment must include the quality of life of aschizophrenic person. This study aims to examine the relationship between cognitive impairment and performance of the person with schizophrenia. Cognitive test is scaled with Indonesian version of Montreal Cognitive Assessment (MoCA-Ina), while personal and social performance is scaled with Personal and Social Performance scale. There are many studies that search the relationship between cognitive impairment and social functioning of schizophrenic patients, but this is the first study that uses PSP and MoCA-Ina. Both PSP and MoCA-Ina are easy to use but still have high sensitivity and specificity, and perhaps can build people’s interest to use it in clinical practice. Twenty-five male schizophrenic patients were assessed in Prof. M. Ildrem Mental Hospital of North Sumatera Province of Indonesia. Positive correlations between MoCA-Ina and PSP score were identified. Clinicians should pay attention to cognitive and might give some early intervention to it.

1. Introduction
Schizophrenia is a mental illness that manifests most widely, dramatically and tragically. This disease affects not only the sufferer, but also the family and society.[1] According to World Health Organization (2016), there are 21 million people with schizophrenia in all over the world.[2] The 2010 Global Burden Disease data shows that mental illness, neurological diseases, and substance abuse accounted for 10.4% of total disability-adjusted life years (DALYs), 2.3% of Years of Life Lost due to Premature Mortality (YLLs) and 28.5% Years Lost due to Disability (YLD).[3]

The goal of schizophrenic treatment both pharmacologically and psychosocial continues to develop. In the 1950s, the treatment of schizophrenia aims to overcome attacks, reduce self-injury and improve patient hygiene. The move towards improving antipsychotic then make positive symptom such as hallucination and delusion as the focus of treatment. Treating only the positive and negative symptom is insufficient. The effectiveness and successful treatment must include the quality of life and psychosocial function of the patient.[4]

Various studies have been done to explain what things can affect social function inschizophrenics patients. Woon et al.(2009) in China found that schizophrenics patients were lower in quality of life compared to healthy control groups. Pandina et al. in 2012 in the United States found a significant relationship between cognitive function, symptoms, and quality of life of schizophrenics. Langdon, et al. in 2014 in Australia found a significant association between neurocognition and patient quality of
life. In fact, more than 75 percent of schizophrenics suffer from cognitive impairment and 7.98 percent of schizophrenics exhibit poorer cognitive functional examination results when compared to their parent's educational level.[5-8] From the various backgrounds above, it is seen that with the various tools and methods used, the cognitive function mentioned is a strong predictor of social function and overall quality of life.[5]

There are many tests to assess cognitive function in schizophrenic patients. Most of these tests take a lot of time in their usage.[5] A cognitive function examination method that is short enough but effective to use practically in clinical practice is required. The Montreal Cognitive Assessment (MoCA) is an easy-to-use, fast and sensitive instrument for measuring cognitive function in schizophrenic patients.[9] The measurement of social and personal functions of schizophrenic patients is also debated and not so clear, and the scale for measuring it often overlaps with psychopathological measurements scale. In order to pursue appropriate interventions to optimize the quality of life of patients, the measurements of social and personal functions are necessary.[10] The Personal And Social Performance Scale (PSP) was developed to create a practical measuring tool for viewing the social and personal functions of schizophrenic patients.[10,11]

As far as tracing is being done, we have not found a study that looks at the correlation between these two terms using the PSP Scale to measure social and personal functioning and Montreal Cognitive Assessment (MoCA) to measure cognitive function in schizophrenic patients. The authors wanted to see a correlation between social function as measured by PSP Scale and cognitive function as measured by MoCA-Indonesian version (MoCA-Ina) in schizophrenic patients. The results of this study are expected to provide information about the correlation between social and personal functions and cognitive function in schizophrenic patients, to give an idea that cognitive function is a targeted therapy that must be developed and to be the basis of consideration for performing regular cognitive and social functional examinations on clinical practice.

2. Method
This study is a correlative analytical research with cross-sectional approach. Located at Prof.dr. M. Ildrem Mental Hospital Medan between November 2016-January 2017. The sample of the study was schizophrenic patients who were hospitalized in Prof. dr. M. Ildrem Mental Hospital Medan that meets the following inclusion criteria: male schizophrenic patients diagnosed with ICD-X, are in a stable phase where Positive and Negative Syndrome Scale (PANSS) scores <60, duration of illness 2-10 years, aged between 30-40 years, negative family history, senior high school or equivalent education, unmarried, not working, using Risperidone 4 mg per day, and cooperative. Exclusion criteria in this study were: have a general medical disorder and or other comorbidities. We select the sample by purposive sampling.

Since this study is a first study to examine the correlation between the social and personal function of people with schizophrenia using PSP scale and cognitive function using the MoCA-Ina, to obtain a minimum correlation value that is considered meaningful (r), we conducted preliminary research by recruiting 12 subjects of schizophrenia. We found the value of r in the preliminary study is 0.607. The calculation of the sample size gives the sum of 25. All study subjects were required to complete a written consent to participate in the study after being given detailed and clear explanations. This study has obtained approval from the Research Ethics Committee of the Faculty of Medicine, Universitas Sumatera Utara. The interrater reliability test for PANSS measurement using the Cohen's Kappa coefficient was obtained 0.82 (p<0.001) and for PSP was 0.82 (p<0.001)

We assessed inpatients schizophrenic patients in Prof. dr. M. Ildrem Mental Hospital during December 2016-January 2017. We make a diagnosis of schizophrenia based on ICD-X criteria by structured interview using Mini International Classification of Disease-10 (ICD-10) instrument. Subjects who agree to participate will sign an informed consent. We conduct a PANSS assessment of the subject. If the total score of PANSS is> 60, they were excluded. The author performs a PSP scale check on the patient and asks the nurse intheroom where the subject is treated, with the measured
observed in the past one month. We perform the MoCA-Ina assessment. We found the data to be normal in distribution; then we analyzed using Pearson correlation test.

### 3. Result and discussion

We found 25 schizophrenic patients, ages 30-40 years, education level is senior high school, duration of illness 2-10 years, single, unemployed, using Risperidone in fix dose 4 mg/ day at least for two months, and PANSS total score ≤ 60.

| Table 1. Demographic characteristic of male schizophrenic patients. |
|--------------------------|------------------|------------------|
| Description              | n (%)            | Mean + SD        |
| Ages                     | 25(100)          | 33.04±1.92       |
| Duration of illness      | 25(100)          | 6.64±2.25        |

From the literature, we know that both cognitive function and social and personal performance influenced by many factors such as antipsychotic, gender, duration of illness, working status, marital status, and level of education. Inclusion and exclusion criteria were set to control the confounder factors above. In the adult, several factors such as increase of hormone level and structural maturation and function of the organ involved in processing the information differentiated male and female. Gray matter lost through brain maturation in male or the protective factor of estrogen in female can affect the disease as well.[12] It is reported that male show more difficulty in verbal memory, emotion, and flexibility. Female show better improvement and outcome than male.[12] Considering this fact, this study is restricted to male schizophrenic patients.

| Table 2. PSP and MoCA-Ina total score. |
|----------------------------------------|------------------|
| n | MeanSD                       |
|---|------------------------------|
| PSP total score | 25 | 60.56±8.63 |
| MoCA-Ina Total score | 25 | 21.72±4.74 |

Mean of PSP total score in this study is 60.65 and the standard deviation is 8.63. If we refer to PSP scoring interval, the point is indicated the real difficulty in one of this domain: self-care, social activity, social and personal relation and difficulty in aggressive behavior. Purnama et al. say that PSP score lower than 70 indicated a low function level of the patients.[10] Qiao et al. (2014) found PSP total score in 220 schizophrenic patients is 54.69±15.32, PANSS total score 67.23± 8.62.[13] Garza et al. (2016) found PSP total score in 60 male schizophrenic patients is 60.5±17.[14] The differences in PSP scores among studies may be due to differences in demographic characteristics of study subjects, sample size, study design and other factors.

The mean MoCA-Ina score in this study subjects was obtained at 21.72 with astandard deviation of 4.74, indicates a deterioration in cognitive function in the study subjects, where the cutoff score for MoCA-Ina is 26. Wu et al. in 2014 in Canada found a mean MoCA score of 21.26 with astandard deviation of 5.63 in 121 schizophrenic patients, 64 % of which were male.[9] Musso et al. in 2014 in the United States found MoCA scores in schizophrenics of 20.17 with a standard deviation of 4.19, of which 89% were male.[15] Fransiska et al. in 2015 in Indonesia measured cognitive function in schizophrenic patients of light smokers and heavy smokers. An obtained average score of MoCA-Ina in a group of light smoker schizophrenic equal to 19.92 with standard deviation 3.08, while for aschizophrenic group of heavy smoker mean score of MoCA-Ina 18.28 and standard deviation 3.28. The p-value of 0.75 indicates that there is no significant difference in mean MoCA-Ina scores between the two groups. The result of this study is all consistency with the previous studies. As described in the previous chapter, up to 86% of schizophrenics experience a decline in cognitive function. A meta-analysis of 12 studies involving 4000 cases of schizophrenia and over 700,000 healthy controls.
indicated that a low IQ increased the risk for schizophrenia.[17] Another study stated this risk has been around since the age of 13 years, long before the onset of psychosis appears.[14]

In recent decades, advances in imaging techniques provide knowledge of the etiology of this disease. Several studies using functional Magnetic Resonance Imaging (fMRI), found decreased activation in fronto-parietal tissue and decreased gray matter volume in high-risk groups when given a cognitive function test (N-back working). There is a positive correlation between structural change and function decline. Other studies found a positive correlation between neuronal activation and cortical thickening in most of the prefrontal and parietal areas of schizophrenic patients, where this is not found in healthy individuals. Several studies have found a decrease in anterior dorsal cingulate cortex activation (dACC) in schizophrenic patients. This is the pathomechanism of cognitive function changes in schizophrenia.[18]

The result of correlation test of both variables obtained r value is 0.64 indicates a strong correlation, with p-value 0.001. This is consistency with a study in Taiwan that measured the correlation between PSP and cognitive function, in which the rating scale used to assess cognitive function was Wechsler Memory Scale-Revised Version (WMS-R) in 20 schizophrenic patients. Correlation value was found between PSP and visual memory scale r = 0.59 (p-value = 0.007); PSP and delayed recall scale of 0.70 (p-value = 0.001); PSP and general memory r = 0.70. (p-value<0.0005).[19] Because the differences between subjects in this study were on cognitive function as measured by MoCA-Ina, it was believed that the correlation found was between cognitive function and social and personal function. Another aspect is considered to be no longer affected because it has managed to control all confounding factors, such as age, duration of illness, antipsychotic use, education, occupational status, marital status, and dominant symptom suffered by the subject.

3.1. Strength and limitation
This study uses the PSP and Moca-Ina instruments. Both of these instruments are known to be practical measures that do not require special expert interpretation, but still, have high sensitivity and specificity in measuring the social and personal functioning and cognitive function of schizophrenic patients. Given the time required to perform the examination with these two instruments is not long, it is expected that clinicians consider their routine use in clinical practice.

This study looks at the correlation between cognitive function and social and personal function of schizophrenic patients. This study does not consider the work history of the respondents before the ill because it is difficult to collect a certain number of respondents against the same background of previous work. Employment status is only assessed during the interview. Nor does this study take into consideration the socio-economic factors of previous respondents, which may affect social and personal functioning.

4. Conclusion
A total of 25 respondents who participated in this study is schizophrenic patients who are hospitalized in the inpatient installation of Prof. dr. M. Ildrem Mental Hospital Medan period November 2016-January 2017. From the study, we found the level of social and personal function measured by PSP scale show the real difficulty in one of this domain: self-care, social activity, social and personal relation and difficulty in aggressive behavior. Cognitive function was found to be impaired. There is a significantly strong correlation between the social and personal function of schizophrenic patients and their cognitive function.

References
[1] Sadock B J, Sadock V A and Ruiz P 2013 Schizophrenia and other psychotic disorders Kaplan & Sadock’s comprehensive textbook of psychiatry
[2] Whiteford H A, Ferrari A J, Dagenhardt L and Feigin V 2015 The global burden of mental, neurological and substance use disorders: an analysis from the global burden of disease Plos ONE
[3] Juckel G and Morosini P L 2008 The new approach: psychosocial functioning as a necessary outcome criterion for therapeutic success in schizophrenia *Curr. Opin. Psych.* **21** 630

[4] Carbon M and Corell U 2014 Thinking and acting beyond the positive: the role of the cognitive and negative symptoms in schizophrenia *CNS Spectrum* **19** 35

[5] Pandina G, Bilder R, Turkoz I and Alphs L 2013 Identification of clinically meaningful relationship among cognition, functionality, and symptom in subjects with schizophrenia or schizoaffective disorder *Schizophrenia Res.* **143** 312

[6] Lawrence R E, First M B and Lieberman J A 2015 Schizophrenia and other psychoses *Psychiatry* **816**

[7] Keefe R S E and Eesley C E 2010 Neurocognitive impairments *Essentials Schizophrenia*

[8] Wu C, Dagg P and Molgat C 2014 A pilot study to measure cognitive impairment in patients with severe schizophrenia with the montrealcognitive asessement (MoCA) *Schizophrenia Res.* **158** 151

[9] Jelastopolu E, Giourou E, Merekoulias G, Mestoussi A, Moratis E and Alexopoulos E 2014 Correlation between the personal and social performance scale (PSP) and the positive and negative syndrome scale (PANSS) in a greek sample of patients with schizophrenia *BMC* **14** 197

[10] Morosini P L, Magliano L, Brambilla L, Ugolini S and Pioli R 2000 Development, reliability, and acceptability of anew version of the DSM-IV social and occupational functioning assessment scale (SOFAS) to assess routine social functioning *Acta Psych.* **101** 323

[11] Amalina D B 2014 Social and personal functioning in schizophrenia: relationship to sociodemographic and clinical factors *J. Biol. Agric. Healthcare* **4** 24

[12] Perez R, Victoria G and Ulloa E 2016 Sex differences in severity, social functioning, adherence to treatment, and cognition of adolescents with schizophrenia *Schizophrenia Res. Treat.*

[13] Qiao Y, He S, Su L, Zhu J Z, Sheng J H and Li H F 2016 Applicability of the chinese version of the personal and social performance scale in patients with severe mental disorders *Wiley Asia Pac. Psych.*

[14] Dickson H, Laurens K R, Cullen A E and Hodgkins S 2012 Meta-analysis of cognitive and motor function in youth aged 16 years and younger who subsequently develop schizophrenia *Psychol. Med.* **42** 743

[15] Musso M W, Cohen A S, L Tracey, Auster E J and McGovern E 2014 Investigation of the Montreal Cognitive Assesment (MoCA) as a cognitive screener in severe mental illness *Psych. Res.* **220** 664

[16] Fransiska A 2017 The differences of montreal cognitive assessment scores in Indonesian version (MoCA-Ina) between male patient schizophrenic light and heavy smoker *Int. J. Res. Med. Health Sci.* **14** 4

[17] Kahndaker G M, Barnett J H, White I R and Jones P B 2011 A quantitative meta-analyses of population based study of premorbid intelligence and schizophrenia *Schizophren. Res.* **132** 220

[18] Schult C C, Poli P F, Wagner G, Koch K, Schachtzabel C, Gruber O, et al. 2012 Multimodal functional and structural imaging investigation in psychosis research *Eur. Arc. Psych. Clin. Neurosci.* **2** 97

[19] Hsieh P C, Huang H Y, Wang H C, Liu Y C, Bai Y A, Chen K C, et al. 2011 Intercorrelation between the personal and social performance scale, cognitive function, and activities of daily living *J. Nervous Mental Dis.* **199** 513