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RELIABILITY OF POSITIVE AND NEGATIVE SYMPTOM SCALE (PANSS) INDONESIAN VERSION IN ACEHNESE POPULATION

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ABSTRACT
The positive and negative syndrome scale (PANSS) has been widely used and validated for the assessment of severity of schizophrenia symptoms. However, the reliability of PANSS Indonesian version in Acehnese population has yet been divined. Research objective: to examine the reliability of PANSS in Acehnese schizophrenic patients. Methodology: A cross sectional study was conducted at Mental Hospital, Banda Aceh, Indonesia, from February to May 2024. Patients aged 18 and above, who were diagnosed with schizophrenia were included in this study, meanwhile patients with organic mental disorders, and history of alcohol or drug consumption were excluded. Two independent psychiatrists separately assessed the patients using PANSS, which consisted of 3 components: positive symptoms (P subscore - 7 questions), negative symptoms (N subscore – 7 questions) and general psychopathology symptoms (G score - 16 questions). Inter-rater reliability was measured using the intraclass correlation coefficient (ICC), in which ICC ≥ 0.60 was considered good. Results: Of twenty subjects enrolled, 70% were males, and the median age was 35 years (23-54). The overall ICC was excellent = 0.987 (0.982-0.994) on 95% confidence interval. Conclusion: PANSS is a reliable tool to assess the severity of schizophrenia in Acehnese population, emphasizing its importance in the clinical setting.

Keywords: acehnese; PANSS; schizophrenia

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INTRODUCTION

Schizophrenia is a severe and chronic mental disorder that significantly impacts individuals, families, and communities worldwide. According to the World Health Organization (WHO), schizophrenia affects approximately 20 million people globally, with notable variations in prevalence and impact across different regions and population.(Carteri et al., 2020) The disorder is characterized by distortions in thinking, perception, emotions, language, sense of self, and behavior. Its symptoms are typically classified into positive symptoms (such as hallucinations and delusions), negative symptoms (such as apathy and lack of emotion), and cognitive impairments. (Carteri et al., 2020) In Indonesia, the prevalence of schizophrenia is estimated to be around 1.7 per 1,000 population, translating to approximately 400,000 people living with the disorder.(Kementerian Kesehatan RI, 2018) The burden of schizophrenia in Indonesia is substantial, with significant social, economic, and health implications.(Kementerian Kesehatan RI, 2018) Among the provinces, Aceh is of particular interest due to its unique cultural, historical, and socio-political context. Aceh, located at the

northern tip of Sumatra, has a distinct cultural heritage and a history marked by prolonged conflict and natural disasters, which have shaped its health and social landscapes.(Humaira et al., 2020).

The Positive and Negative Syndrome Scale (PANSS) is one of the most widely recognized and used tools for assessing the severity of schizophrenia symptoms. Developed by Kay, Fiszbein, and Opler in 1987, the PANSS provides a comprehensive measure of schizophrenia's impact by evaluating positive symptoms, negative symptoms, and general psychopathology. The scale's robust psychometric properties have made it a gold standard in schizophrenia research and clinical practice. Its extensive use in various cultural contexts has necessitated the translation and validation of the scale in numerous languages, including Indonesian.Validation studies of the Indonesian version of the PANSS have demonstrated its utility and reliability across different populations within Indonesia. For instance, Amin, M et al (2022) conducted a study to validate the Indonesian version of PANSS and found it to be a reliable and valid tool for assessing schizophrenia symptoms in Indonesian patients.(Amin et al., 2023) However, despite these promising findings, specific studies focusing on the Acehnese population are limited.

Ethnicity, race, and cultural background can significantly influence the presentation, perception, and management of schizophrenia. Genetic, environmental, and socio-cultural factors contribute to the observed differences in schizophrenia prevalence and symptomatology among different ethnic groups.(Rao et al., 2021) For instance, cultural beliefs and practices can affect how symptoms are expressed and understood, which in turn influences diagnosis and treatment. In the context of Indonesia's diverse ethnic landscape, it is crucial to consider these cultural influences to ensure accurate diagnosis and effective treatment.Despite the widespread use and validation of the PANSS in Indonesia, the reliability of this scale in the Acehnese population has yet to be thoroughly examined. The unique cultural and socio-economic conditions in Aceh, including the impact of prolonged conflict, tsunami recovery efforts, and distinctive cultural practices, may affect the manifestation and assessment of schizophrenia symptoms in this population.(Baklien et al., 2023) Therefore, it is essential to evaluate whether the Indonesian version of PANSS provides reliable and valid assessments for Acehnese patients with schizophrenia.This study aimed to test the inter-rater reliability of PANSS in Acehnese schizophrenic patients. Understanding the reliability of PANSS in this specific population will help clinicians and researchers to accurately assess the severity of schizophrenia symptoms and tailor interventions accordingly.

METHOD

This is a cross-sectional study to assess reliability of PANSS through inter-rater measurements. The study was conducted at Mental Hospital, Banda Aceh, Indonesia, from February to May 2024. This is the biggest and the main referral mental hospital in the province, whose patients came from all over Aceh. Convenient purposive sampling was used to recruit study participants.(Sastroasmoro & Ismael, 2015) The inclusion criteria were schizophrenic patients who were hospitalised and diagnosed based on ICD-10 diagnostic criteria, and aged above 18. Patients with comorbidities including organic mental disorders, and history of alcohol or drug consumption were excluded. Assessment using PANSS were made by two independent psychiatrists separately (Dr. J and Dr. S). The questionnaire, the Indonesian version of PANNS, consisted of 3 evaluation components: positive symptoms (P subscore - 7 questions), negative symptoms (N subscore - 7 questions) and general psychopathology symptoms (G score - 16 questions). Each items of the PANSS was rated on a 7-point scale (1=absent, 2=minimal, 3=mild, 4=moderate, 5=moderate severe, 6=severe, and

7=extreme), therefore the total score tanged from 30 to 210.(Leucht et al., 2005) Each participants were rated by two raters in different rooms and time. The ratings were made with reference to the participant's symptoms during the past week.Inter-rater reliability was measured using the intraclass correlation coefficient (ICC) for total PANNS score. Scores are interpreted as excellent (0.91-1.00), good (0.76–0.90), moderate (0.51–0.75), and poor (<0.50) reliability.(Kølbæk et al., 2018). Analysis was done using Statistical Package for Social Science (SPSS) 26.0.

RESULT

A total of twenty patients with schizophrenia participated in this study. Seventy percent of the participants were male and the median age was 35 years (23-54). The median/mean of ICCs for each component of PANNS was presented in Table 1. The ICCs for the PANNS total score was = 0.987 (0.982-0.994), categorised as excellent.

Table 1.
The inter-class correlation coefficients (ICC) for PANSS sub components and total score.

Components	Dr J	Dr S	ICC (95% CI)
P sub-score (Median, Min-Max)*	32.0 (12.0-42.0)	32.5 (26.6-34.9)	0.995 (0.987 – 0.998)
N sub-score (Median, Min-Max)	13.0 (7.0-42.0)	12.5 (11.3-22.5)	0.997 (0.992 – 0.998)
G sub-score (Mean ± SD)**	45.1 ± 2.9	45.1 ± 2.8	0.988 (0.986 – 0.995)
Total normal (Mean ± SD)	92.6 ± 4.4	92.7 ± 4.5	0.987 (0.982 – 0.994)

***** Not normal distribution based on Saphiro-Wilk normality test
** Normal distribution based on Saphiro-Wilk normality test

DISCUSSION

Demographic Characteristics

The objective of this study was to test the inter-rater reliability of PANSS in Acehnese population, focusing on patients diagnosed with schizophrenia at the Mental Hospital, Banda Aceh. The results indicated an excellent inter-rater reliability, with an ICC of 0.987, suggesting high consistency between the two independent psychiatrists' assessments. The study's finding that 70% of the subjects were male aligns with existing literature on schizophrenia, which often reports a higher prevalence in males. For instance, a study by Orrico-Sánchez et al (2020)(Orrico-Sánchez et al., 2020) found that the incidence of schizophrenia is higher in males than in females, particularly in younger age groups. Data from global burden of disease 2019 showed that schizophrenia sex ratio inverts throughout the lifespan, in which prevalence of schizophrenia in females higher than males after age 65, with males having earlier age of onset, and females longer life expectancy. (Solmi et al., 2023)One key factor contributing to this gender difference is the earlier onset of the disorder in males. Males typically experience the onset of schizophrenia during late adolescence to early adulthood, whereas females often have a later onset, usually in their mid-20s to early 30s.(Neill et al., 2020) This earlier onset in males is significant because the brain is still undergoing crucial developmental processes during adolescence, making it more susceptible to disruptions that can lead to schizophrenia.(Neill et al., 2020)

Several biological and environmental factors have been proposed to explain this increased vulnerability in males. Hormonal differences, particularly the protective effects of estrogen, are believed to play a crucial role.(Brzezinski-Sinai & Brzezinski, 2020) Studies have also indicated that the genetic architecture of schizophrenia may differ between males and females, with some risk genes having a greater impact on males.(Jaaro-Peled & Sawa, 2020) Additionally, males may be more vulnerable to prenatal and perinatal factors such as maternal infections, nutritional deficiencies, and birth complications, which have been linked to an

increased risk of developing schizophrenia.(Karlsson & Dalman, 2019) Environmental and psychosocial factors further contribute to the higher prevalence of schizophrenia in males. Males are more likely to engage in substance abuse, which is a known risk factor for schizophrenia.(Giordano et al., 2021) Moreover, males often experience higher levels of social stress and are less likely to seek help for mental health issues, which can lead to delays in diagnosis and treatment. (Giordano et al., 2021; Kirchebner et al., 2022; Mansueto & Faravelli, 2022).

The median age of 35 years observed in this study is consistent with the literature. Schizophrenia commonly manifests in late adolescence to early adulthood, with the majority of cases diagnosed between the ages of 18 and 35.(Sommer et al., 2020) A large clinical cohort of 26,163 patients with a diagnosis of schizophrenia showed that the mean age at the first assessment was 37.6 years and mean age at the first diagnosis of schizophrenia was 39.3 years.(Lopez-Castroman et al., 2019) This age distribution reflects the critical period during which schizophrenia symptoms tend to emerge and underscores the importance of early detection and intervention in this age group. While schizophrenia onset before age 35 might be more linked to genetic and early developmental issues, onset around 35 might be influenced by hormonal changes, including those related to the endocrine system. For example, cortisol levels, which are related to stress, may fluctuate more significantly around this age, potentially impacting mental health.(Patel et al., 2021) Moreover, by the age of adulthood, individuals often face significant life stressors, such as career pressures, family responsibilities, and social expectations that might exacerbate underlying vulnerabilities to schizophrenia.(Vargas et al., 2020) In adulthood age, individuals are expected to have developed a certain level of cognitive and emotional maturity. However, those with latent schizophrenia might struggle with meeting these societal expectations, leading to a breakdown in their ability to function normally. This can precipitate or exacerbate symptoms of schizophrenia.(Nakamura, 2022)

Inter-Rater Reliability of PANSS

The excellent inter-rater reliability of PANSS in this study, with an ICC of 0.987, is in line with previous studies that have demonstrated the scale's robust psychometric properties. For instance, a large multi-ethnic study involving 3500 schizophrenia participants to assess the reproducibility and generalizability of PANSS reported an ICC of 0.966 for the overall PANSS score, indicating high reliability across different raters.(Lim et al., 2021) A preliminary study assessing reliability of PANNS-6 Chinese version in diagnosing schizophrenia showed that PANSS-6 were significantly correlated with that of PANSS-30, with sensitivity and sensitivity of PANSS-6 were 0.77 and 0.84, respectively. Meanwhile, the internal consistency of PANSS-6 measured with the Cronbach's α coefficients were 0.72. All of these suggesting that the PANNS-6 is a sound scale for measuring psychotic severity and monitoring treatment outcomes of schizophrenia in clinical settings.(Li et al., 2021)

The PANSS comprises three main components: positive symptoms, negative symptoms, and general psychopathology symptoms. Positive symptoms include delusions, hallucinations, and thought disorder, while negative symptoms encompass blunted affect, emotional withdrawal, and lack of spontaneity. General psychopathology symptoms cover a broader range of issues, such as anxiety, depression, and social dysfunction.(Shafer & Dazzi, 2021) Interpreting PANSS scores involves evaluating the severity of these symptoms, with higher scores indicating greater symptom severity. The scale's comprehensive nature allows for a detailed assessment of schizophrenia's multifaceted symptoms, facilitating targeted treatment approaches and monitoring of treatment efficacy.(Fountoulakis et al., 2021) Inter-rater

reliability refers to the degree of agreement between different raters assessing the same phenomenon. It is crucial for ensuring the consistency and accuracy of clinical assessments. In this study, inter-rater reliability was measured using the intraclass correlation coefficient (ICC), with an ICC ≥ 0.60 considered good. The excellent ICC of 0.987 observed in this study indicates high consistency between the two independent psychiatrists' PANSS assessments, affirming the scale's reliability. This finding is in accordance with previous study that showed the ICC of PANNS was 0.966 for the overall PANNS score.(Li et al., 2021).

Several factors might influence ICC values, which includes rater training and experience, standardization of procedures, patient characteristics, technological tools, and environmental factors. One of the primary factors is the level of training and experience of the raters. Comprehensive training programs and standardized procedures can significantly enhance the ICC values. Experience also plays a vital role; experienced raters generally achieve higher ICC values compared to their less experienced counterparts.(Nielsen et al., 2022) Both raters in this study were certified psychiatrists who had been trained in utilising PANNS. Moreover, both of the raters had more than ten years clinical experience and had been using PANNS in their clinical practice. Thus, the findings of this study is trustworthy.

CONCLUSION

The high ICC observed in this study suggests that the Indonesian version of PANSS is a reliable tool for assessing schizophrenia symptoms in the Acehnese population. This finding is significant as it confirms the scale's applicability and consistency in a culturally distinct population, providing a valuable instrument for both clinical practice and research in this region.

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