

OPTIMIZING SCHIZOPHRENIA CARE: A MULTI-PARAMETER EVALUATION OF ANTIPSYCHOTIC PRESCRIBING RATIONALITY

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ABSTRACT

Background: Schizophrenia is a chronic mental disorder that requires long-term antipsychotic pharmacotherapy with rational drug use to prevent relapse and improve patients' quality of life.

Method: This study was a descriptive observational study with a retrospective approach aimed at evaluating the rationality of antipsychotic drug use in outpatient schizophrenia patients based on WHO criteria at Hospital X in the Tangerang region, Banten. The study sample consisted of 299 patients who met the inclusion and exclusion criteria, and the analysis was conducted using eight drug use indicators, including indication, patient, drug, dose, frequency, diagnosis, route of administration, and duration of therapy.

Result: The results showed that most patients were male (55%) and aged 26–35 years (31.8%), with paranoid schizophrenia as the dominant diagnosis (98%) and hallucinations as the main symptom (80%). Atypical antipsychotics were the main therapy, with risperidone 2 mg being the most frequently prescribed drug (30.6%), and polypharmacy was found in 59% of patients. The accuracy of drug use reached 100% for indication, diagnosis, route of administration, and duration of therapy, and was also high for drug selection (99%), patient (99.3%), and dose (97.7%), while frequency accuracy was lower (82.6%).

Conclusions: Overall, antipsychotic use at Hospital X demonstrated a high level of rationality and was aligned with evidence-based practice principles; however, improvements are still needed in dosing frequency accuracy and stronger collaboration between psychiatrists and clinical pharmacists to minimize potential drug-related problems in patients receiving combination therapy.

Keywords: Schizophrenia; Antipsychotic Drugs; Drug Therapy

INTRODUCTION

Schizophrenia is a severe mental disorder characterized by distortions in the perception of reality, such as delusions, hallucinations, disorganized thinking, and behavioral disturbances that cause significant dysfunction in the patient's social, occupational, and quality of life. This condition is also associated with a high global burden of disease, including increased disability and long-term decline in social functioning^{1,2}. Furthermore, schizophrenia contributes to a significant public health burden, both in terms of economic and social costs, as well as long-term healthcare needs³. Suboptimal management of schizophrenia can increase the risk of relapse, long-term disability, increased healthcare needs, and the risk of dangerous behaviors, including suicide. This situation indicates the importance of structured, evidence-based, long-term therapy to prevent worsening clinical outcomes^{1,4}.

The World Health Organization (WHO) reports that schizophrenia is a severe mental disorder that affects millions of people worldwide and is one of the leading causes of long-term disability due to severe mental disorders¹. In Indonesia, the prevalence of severe mental disorders was reported at 1.7 per thousand based on the 2013 Basic Health Research (Riskesdas)⁵, with variations between regions, including in Banten Province at 1.1 per thousand. These data indicate that schizophrenia remains a significant public health problem at the global, national, and regional levels, thus requiring comprehensive management and control efforts^{5,6}.

Schizophrenia has a prevalence of approximately 7–8 cases per 1,000 population and is more common in males than females. Various multifactorial risk factors, including genetics, environmental factors, abnormalities in brain structure and

function, infections during development, and exposure to psychosocial trauma, influence this difference in prevalence. The complex interaction between these biological and environmental factors plays a role in increasing an individual's vulnerability to developing schizophrenia^{7,8}.

Management of schizophrenia generally focuses on pharmacological therapy, with antipsychotic medications as the primary line of treatment. This therapy aims to control psychotic symptoms, prevent relapse, and maintain the patient's clinical stability and social functioning in the long term. Antipsychotic use also needs to be individually tailored based on clinical response, tolerability, and side-effect profile to achieve optimal therapeutic outcomes^{9,10}.

Although antipsychotics are effective in the management of schizophrenia, their use requires caution due to their long-term nature and the potential for significant side effects, drug interactions, and irrational polypharmacy if not in accordance with the principles of appropriate medication use.

This condition can result in decreased adherence to therapy and an increased risk of adverse events in patients. Therefore, rational use of antipsychotics is a crucial aspect in ensuring the effectiveness of therapy and the safety of schizophrenia patients^{9,11}.

Rational medication use is a key indicator of healthcare quality. The World Health Organization (WHO) reports that more than 50% of medications worldwide are prescribed, administered, or used inappropriately, and approximately 50% of patients do not use their medications as directed. This situation indicates that the problem of irrational medication use remains a global challenge, impacting therapeutic effectiveness, patient safety, and increasing healthcare costs¹².

In Indonesia, an estimated 40–60% of medication use is still irrational, which includes inappropriate indications, drug selection, dosage, duration of therapy, route of administration, and the use of polypharmacy that does not comply with guidelines. This situation indicates that irrational medication use remains a significant challenge in healthcare, including mental health services. Irrational drug use may reduce therapeutic effectiveness, increase the risk of adverse drug reactions, and lead to poorer clinical outcomes¹³.

Several studies in psychiatric hospitals in Indonesia still indicate irrationality in the use of antipsychotic medications. This is consistent with literature reporting that antipsychotic polypharmacy and deviations from treatment guidelines are still common in clinical practice, despite the availability of evidence-based recommendations^{11,14}. A study by Dewi R et al. (2024) in a regional psychiatric hospital reported dose accuracy of 88% and frequency accuracy of 70%, indicating ongoing variation in the appropriateness of treatment regimens¹⁵. Similar findings were reported at Dr. Amino Gondohutomo Hospital in Semarang, with drug selection accuracy of 90.7% and dose accuracy of 89.3%, indicating approximately 9–10% inaccuracy in pharmacological therapy¹⁶.

However, most of these studies have focused on specialized psychiatric hospitals and have not consistently used the indicators of rational drug use recommended by the WHO, namely appropriate indication, drug, dose, frequency, and duration of therapy. This condition causes the picture of antipsychotic prescribing practices in general hospitals to be relatively limited,

so further research is needed to provide a more comprehensive picture of the rationality of drug use in various health care settings¹².

Based on this, there is a need to examine the characteristics of antipsychotic medication use based on the WHO-recommended rational drug use criteria in general hospitals, particularly in the Tangerang area, which has a high healthcare dynamic. This study aims to evaluate the rationality of antipsychotic medication use in schizophrenia patients at Hospital X, including the appropriateness of indications, drug selection, dosage, frequency, and appropriateness of the therapy regimen based on WHO criteria.

The results of this study are expected to contribute to the scientific development of clinical pharmacy practice, particularly in improving the quality of antipsychotic prescribing, and to support efforts to enhance patient safety and the quality of therapy in patients with schizophrenia.

CLASSIFICATION OF SCHIZOPHRENIA.

Schizophrenia can be divided into several types according to the DSM-IV-TR (Diagnostic and Statistical Manual of Mental Disorders)⁷, as follows:

Paranoid Schizophrenia

To meet the general criteria for a diagnosis of schizophrenia, patients must exhibit prominent hallucinations or delusions as the primary symptom. These hallucinations are generally auditory hallucinations, such as threatening voices or command hallucinations, or nonverbal hallucinations in the form of sounds such as whistling, humming, or laughing.

Disorganized/Hebephrenic Schizophrenia

The Guidelines for the Classification and Diagnosis of Mental Disorders III explain that hebephrenic schizophrenia meets the general criteria for a diagnosis of schizophrenia. The diagnosis of hebephrenia is usually first made in adolescence or young adulthood, between 15 and 25 years of age. The personality before the onset of premorbid symptoms often exhibits traits such as shyness and a tendency to withdraw. This characteristic picture reflects the persistent reality of irresponsible and unpredictable behavior and an odd acting style. There is a tendency to avoid social interactions, to display a lack of purpose, and to be unable to experience deep emotions. Patients often exhibit shallow and inappropriate reactions, including giggling, self-satisfaction, or self-smiling¹⁸.

Residual Schizophrenia

To achieve an accurate diagnosis, these criteria include clearly visible negative symptoms of schizophrenia, such as decreased activity, flat affect, passivity or lack of initiative, and ineffective non-verbal communication, including facial expressions that display no emotion. Furthermore, there are also problems with adequate self-care and social performance.

Catatonic Schizophrenia

One of the clinical characteristics that may appear is changes in psychomotor activity, such as characteristic body postures, agitation or restlessness, and exaggerated responses to environmental stimuli. Furthermore, symptoms such as command automatism, which is the tendency to obey commands without conscious consideration automatically, and the phenomenon of repetitive repetition of words or sentences (echolalia or perseveration) may be present.

Unspecified Schizophrenia

This type of schizophrenia has an important criterion characterized by the presence of symptoms that meet criterion A but are not included in the categories of paranoid, hebephrenic, or residual schizophrenia¹⁸.

MATERIALS AND METHODS

Research Design

This study employed a descriptive observational design with a retrospective approach. Data were collected through a review of the medical records of outpatients diagnosed with schizophrenia who received antipsychotic therapy at Hospital X, Tangerang, Banten, Indonesia, during the period from January to December 2024.

Population and Sample

The study population consisted of all outpatients diagnosed with schizophrenia who received antipsychotic therapy at Hospital X, Tangerang, Banten, Indonesia, during 2024, totaling 299 patients. Patient records were identified from the hospital medical record database based on the diagnosis of schizophrenia and subsequently screened according to the predefined inclusion and exclusion criteria. The required sample size was determined using the Slovin formula because the study population was known.

Inclusion and Exclusion Criteria

Inclusion criteria were: (1) outpatients diagnosed with schizophrenia according to the medical records, and (2) patients receiving at least one typical or atypical antipsychotic medication during the study period. Exclusion criteria included patients with

concomitant major psychiatric disorders and medical records with incomplete information regarding antipsychotic therapy.

Sampling Technique

A non-probability purposive sampling technique was used. Eligible medical records were selected based on the predefined inclusion and exclusion criteria to ensure that only records containing complete information on antipsychotic therapy were included in the analysis.

Data Collection

Secondary data were extracted from patients' medical records using a standardized data collection form. The collected variables included patient demographic characteristics, schizophrenia diagnosis, prescribed antipsychotic medications, dosage, frequency, route of administration, duration of therapy, and other relevant clinical information required for evaluating the rationality of antipsychotic use.

Research Instrument

The research instrument consisted of a structured checklist developed according to the Indonesian schizophrenia treatment guideline (Regulation of the Minister of Health of the Republic of Indonesia No. 26 of 2020)¹² and the WHO principles of rational drug use¹³. The checklist was used to evaluate the appropriateness of antipsychotic prescribing regarding indication, drug selection, patient suitability, dosage, frequency, route of administration, and duration of therapy.

Ethical Approval

This study was approved by the management of Hospital X (Approval No. 023/RISET/RS AN/V/2025). All patient information was anonymized before analysis to ensure confidentiality and compliance with ethical principles for medical research.

1. RESULT

Demographic characteristics of schizophrenia patients.

A total of 299 patients with a primary diagnosis of schizophrenia were analyzed to describe demographic and clinical characteristics as a basis for evaluating antipsychotic use patterns and therapy efficacy.

Table 1 Demographic characteristics of schizophrenia patients.

Characteristic	Category	n (%)
Gender	Male	163 (55.0)
	Female	136 (45.0)
Age (years)	17–25	76 (25.4)
	26–35	95 (31.8)
	36–45	61 (20.4)
	46–55	34 (11.4)
	56–65	22 (7.4)
	>65	11 (3.7)
Education	No formal education	20 (6.7)
	Primary education	47 (15.7)
	Secondary education	212 (70.9)
	Higher education	20 (6.7)
Marital status	Unmarried	161 (53.8)
	Married	138 (46.2)
Clinical symptoms	Positive symptoms	142 (47.5)
	Negative symptoms	6 (2.0)
	Cognitive symptoms	22 (7.4)
	Comorbid conditions	129 (43.1)
Type of schizophrenia	Paranoid schizophrenia	293 (98.0)
	Residual schizophrenia	6 (2.0)

The study results showed that the patients were predominantly male (55%), with the majority aged 26-35 (32%). They had secondary education (70%), were single (54%), and had paranoid schizophrenia (97%).

Antipsychotic Medication Use

Identifying patterns of antipsychotic medication selection revealed a tendency toward the use of atypical antipsychotics, the most commonly prescribed medication for schizophrenia patients, namely Risperidone 2 mg (31%)

Table 2. Antipsychotic prescriptions by drug class (n = 170)

Drug Class	Drug name	n(%)
Atypical	Risperidone 2 mg	52 (30,6)
	Risperidone 3 mg	23 (13,5)
	Olanzapine 5 mg	12 (7,1)
	Olanzapine 10 mg	28 (16,5)
	Quetiapine fumarate 200 mg	8 (4,7)
	Aripiprazole 10 mg	21 (12,4)
	Clozapine 100 mg	4 (2,4)
Typical	Clozapine 25 mg	4 (2,4)
	Haloperidol 5 mg	2 (1,2)
	Trifluoperazine 5 mg	5 (2,9)

Combination Therapy

Combination therapy identification was conducted to evaluate the level of antipsychotic polypharmacy and the pattern of drug combinations used, as a basis for analyzing the rationality and potential risks of therapy. Based on Table

3, 100 prescriptions (59%) used a combination of two antipsychotics; atypical–atypical combinations were the most prevalent (52%), with risperidone–olanzapine the most frequently used, accounting for 38 prescriptions (22%).

Table 3. Table. Combination Antipsychotic Therapy Regimens

Therapy Type	Drug Combination	n (%)
2-Drug Combination		
Atypical- Atypical	Risperidone-Olanzapine	38 (22,4)
	Risperidone - Clozapine	2 (1,2)
	Risperidone - Aripiprazole	2 (1,2)
	Risperidone - Quetiapine fumarate	6 (3,5)
	Olanzapine - Quetiapine fumarate	2 (1,2)
	Olanzapine - Aripiprazole	2 (1,2)
Typical- Atypical	Risperidone - Haloperidol	14 (8,2)
	Risperidone - Trifluoperazine	7 (4,1)
	Trifluoperazine - Olanzapine	5 (2,9)
	Trifluoperazine - Quetiapine fumarate	2 (1,2)
	Aripiprazole - Haloperidol	4 (2,4)
	Olanzapine - Haloperidol	7 (4,1)
	Aripiprazole - Trifluoperazine	3 (1,8)
	Trifluoperazine - Haloperidol	1 (0,6)
	Chlorpromazine - Olanzapine	1 (0,6)
	Quetiapine fumarate - Haloperidol	1 (0,6)
	Clozapine - Haloperidol	1 (0,6)
3-Drug Combination		
	Haloperidol - Risperidone - Trifluoperazine	1 (0,6)
	Haloperidol - Risperidone - Olanzapine	1 (0,6)
	Clozapine - Risperidone - Haloperidol	1 (0,6)
	Quetiapine fumarate - Risperidone - Trifluoperazine	1 (0,6)
	Haloperidol - Olanzapine - Trifluoperazine	3 (1,8)
	Haloperidol - Olanzapine - Risperidone	1 (0,6)
	Olanzapine - Risperidone - Trifluoperazine	1 (0,6)
	Olanzapine - Risperidone - Quetiapine fumarate	1 (0,6)

Specific Symptoms of Schizophrenia

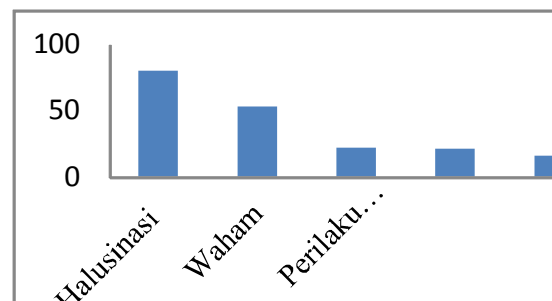


Figure 1. Specific Symptoms of Schizophrenia

The research results (Figure 1) show that the most common specific symptom experienced by schizophrenia patients is hallucinations at 80%.

Appropriateness of Antipsychotic Medication Use

Table 4. Appropriateness of Antipsychotic Medication Use Based on Evaluation Parameters (n:299)

Accuracy Parameters	Category	n (%)
Correct indication	Correct	299 (100,0)
	Incorrect	0 (0,0)
Correct patient	Correct	297 (99,3)
	Incorrect	2 (0,7)
Correct dose	Correct	292 (97,7)
	Incorrect	7 (2,3)
Correct drug	Correct	296 (99,0)
	Incorrect	3 (1,0)
Correct frequency	Correct	247 (82,6)
	Incorrect	52 (17,4)
Correct diagnosis	Correct	299 (100,0)
	Incorrect	0 (0,0)
Correct administration method	Correct	299 (100,0)
	Incorrect	0 (0,0)
Exact delivery time	Correct	299 (100,0)
	Incorrect	0 (0,0)

Overall, the use of antipsychotics shows a high level of rationality, although inaccuracies are still found, especially in the frequency and dosage of drug administration.

DISCUSSION

Demographic characteristics patients.

The results (**Table 1**) show that the majority of outpatients with schizophrenia at Hospital X in the Tangerang, Banten, area are male (55%). Epidemiologically, schizophrenia is more frequently reported in men than in women. This is thought to be related to the protective role of estrogen in women, which modulates the dopaminergic system in the nucleus accumbens, thereby reducing the risk of developing psychotic symptoms¹⁹. Furthermore, men tend to experience an earlier onset of the disease, which is associated with a poorer prognosis and a predominance of negative symptoms such as apathy, alogia, and social withdrawal¹⁹. Social and environmental factors, including exposure to occupational stress and substance abuse, also contribute to the high prevalence of schizophrenia in men⁷.

The age distribution shows that the majority of patients are between 26 and 35 years old (32%), indicating that early adulthood is the most vulnerable period for schizophrenia manifestations. During this phase, individuals are undergoing a life transition with high demands for independence, career development, and social and family responsibilities. These conditions generate complex psychosocial stressors, both internal (anxiety and psychological conflict) and external (work, educational, and interpersonal relationship pressures). If an individual's coping skills are inadequate, these stressors can trigger or exacerbate psychotic symptoms. This finding aligns

with literature showing that the onset of schizophrenia most often occurs in late adolescence to young adulthood, while cases in those under adolescence or over 40 are relatively rare²¹. The predominance of this productive age group confirms that schizophrenia is not only related to biological and genetic factors but also closely linked to the dynamics of psychosocial stress during this crucial life transition.

Regarding educational level, the majority of patients had a secondary education (70%). This level of education can impact an individual's ability to understand health information and adhere to therapy. At the same time, cognitive impairment due to schizophrenia can also hinder the continuation of the educational process. This finding is consistent with previous research reporting that the predominance of patients with secondary education is associated with a high proportion in the productive age group and limited mental health literacy in this population²².

Regarding marital status, the majority of patients were unmarried (54%). Marital status is known to act as a protective factor through social and emotional support from a partner, which can help individuals cope with psychological stress. Conversely, the lack of such support can increase vulnerability to stress and worsen symptoms of schizophrenia²³. These findings emphasize that social support is a crucial determinant of disease course and patient prognosis.

Furthermore, paranoid schizophrenia is the most prevalent subtype (98%). This finding aligns with global reports showing that the paranoid type is the most common clinical form encountered in clinical practice²¹. This subtype is characterized by a predominance of positive symptoms, such as hallucinations and delusions, which are generally more easily recognized than negative symptoms. This condition can lead patients to seek

healthcare more quickly than other conditions with more subtle symptoms.

Use of Antipsychotic Medications

Based on research results (**Table 2**), atypical antipsychotics are the most commonly used therapy, with risperidone 2,0 mg being the most frequently prescribed medication (34%). This dominant use of atypical antipsychotics is related to their effectiveness in controlling both positive and negative symptoms of schizophrenia, as well as their lower extrapyramidal side effect profile compared to typical antipsychotics⁹.

These results also indicate that atypical antipsychotics are preferred in clinical practice due to their better tolerability and perceived suitability for long-term therapy. Furthermore, their relatively stable clinical efficacy and rapid onset of symptom improvement contribute to increased patient acceptance of therapy²¹.

Combination Therapy

Atypical–atypical antipsychotic combination therapy was the most widely used regimen (53%), with the risperidone–olanzapine combination being the most frequently prescribed (**Table 3**). The use of antipsychotic combinations is generally considered in patients who have not achieved an optimal clinical response to monotherapy, particularly in cases with persistent symptoms or inadequate treatment response. Combinations of atypical antipsychotics are expected to increase the effectiveness of symptom control through complementary pharmacological mechanisms without requiring excessive dose increases. In contrast, combinations of typical antipsychotics are relatively rarely used due to the potential increased risk of extrapyramidal side effects without providing significant clinical benefit over safer therapies^{9,11}. These findings indicate that prescribing practices at the study sites consider aspects of effectiveness, therapeutic rationale, and patient safety in the management of schizophrenia.

Clinical Symptoms

The majority of patients exhibit positive symptoms, primarily hallucinations (80%) and delusions (53%), indicating a predominance of the acute phase of schizophrenia. These positive symptoms reflect the activation of the psychotic process, which is generally the primary reason patients seek medical help²⁴. Furthermore, some patients also experience catatonic symptoms, social withdrawal, and disorganized speech, indicating the heterogeneous nature of the clinical manifestations of schizophrenia²⁵. This heterogeneity of symptoms is important to consider when determining treatment strategies, as each symptom dimension (positive, negative, and disorganized) may require different pharmacological and psychosocial approaches to achieve optimal clinical outcomes².

The use of antipsychotic medications appropriate to the indication and diagnosis reached 100%, indicating that all patients received therapy consistent with the clinical diagnosis in accordance with standard care. This study's results reflect the application of evidence-based practice principles in the management of schizophrenia, where diagnostic accuracy is the primary foundation for rational therapy selection. Furthermore, patient safety remains paramount through monitoring comorbidities, drug

allergy history, and potential drug interactions to minimize the risk of side effects and improve long-term therapy safety^{8,9,10}.

The appropriate medication selection rate reached 99%, indicating that nearly all patients received pharmacological therapy in accordance with applicable treatment guidelines. Minor deviations, particularly in the use of typical–typical antipsychotic combinations, are thought to be related to individual clinical response considerations, prior therapy history, or limited drug availability at treatment facilities. These findings emphasize the importance of a rational therapeutic approach and the need for collaboration between psychiatrists and clinical pharmacists to ensure optimal, effective, and safe drug selection for patients with schizophrenia^{9,10,11}.

Dosage accuracy reached 97.66%, while medication frequency accuracy was 82.61%. Inaccuracies were primarily found in elderly patients and in combination therapy regimens, which is suspected to be related to suboptimal dose titration and clinical adjustments based on individual patient conditions. In the elderly population, pharmacokinetic and pharmacodynamic changes can increase sensitivity to antipsychotics, requiring more careful dose adjustments. The results of this study highlight the importance of regular dose titration evaluation, close monitoring of side effects, and enhanced education for healthcare professionals to ensure rational and safe medication use^{10,26,27}. The accuracy of the route of administration and duration of therapy each reached 100%, indicating that all treatment regimens were in accordance with applicable treatment guideline recommendations. Adherence to the correct route of administration is crucial for ensuring optimal drug bioavailability. At the same time, the appropriate duration of therapy plays a role in maintaining treatment continuity and reducing the risk of relapse in patients with schizophrenia. These findings reflect clinical practice that has followed the principles of rational drug use, particularly in terms of route selection and duration of therapy^{9,10,26}.

Drug Interactions

Some combinations, such as the Haloperidol–Risperidone–clozapine combination, have the potential for drug interactions that require caution, particularly regarding the risk of QT prolongation and neuroleptic malignant syndrome (NMS). Therefore, the use of this combination requires close monitoring through electrocardiography (ECG), hematological parameters, and ongoing clinical observation to detect serious side effects early.

Overall, the results of this study indicate that antipsychotic therapy practices at schizophrenia referral hospitals in Indonesia adhere to national and international guidelines with a high degree of conformity, particularly regarding indications, diagnoses, routes of administration, and durations of therapy.

CONCLUSIONS

The practice of antipsychotic medication use in schizophrenia patients at Hospital X in the Tangerang region demonstrated a high level of rationality based on WHO guidelines and the Indonesian Minister of Health Regulation. Patients were predominantly male (55%) in the productive age group 26–35 years, with a primary diagnosis of paranoid schizophrenia (98%). The majority of patients received atypical antipsychotic therapy,

with risperidone 2,0 mg being the most frequently prescribed medication.

The evaluation results showed a 100% accuracy rate for indication, diagnosis, route of administration, and duration of therapy, as well as high scores for drug selection (99%), patient accuracy (99.3%), and dosage (97.7%). However, accuracy in frequency of administration was relatively low (82.6%), an area requiring further attention. Furthermore, polypharmacy was found in 59% of patients, potentially increasing the risk of drug interactions, particularly with atypical antipsychotic combinations.

Overall, the implementation of antipsychotic therapy at this hospital has been conducted in accordance with evidence-based practice principles. However, enhanced clinical monitoring and collaboration between healthcare professionals are needed, particularly in optimize dosage regimens and dosing frequency, as well as to monitor potential side effects through clinical assessments such as ECG and hematology parameters, to ensure the long-term safety of therapy.

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CONFLICT OF INTEREST

the authors declare that there are no conflicts of interest related to this study.

REFERENCE

- World Health Organization. Schizophrenia [Internet]. Geneva: World Health Organization; 2025 [cited 2026 Jul 22]. Available from: <https://www.who.int/news-room/fact-sheets/detail/schizophrenia>.
- Silverstein SM, Lai A. The phenomenology and neurobiology of visual distortions and hallucinations in schizophrenia: an update. *Front Psychiatry*. 2021;12:684720.
- GBD 2016 Disease and Injury Incidence and Prevalence Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet*. 2018;390(10100):1211-59.
- Fazel S, Lichtenstein P, Långström N. Excess mortality in persons with severe mental disorders. *Lancet Psychiatry*. 2014;1(6):444-54.
- Badan Penelitian dan Pengembangan Kesehatan. Riset Kesehatan Dasar (Riskesdas) 2013 [Internet]. Jakarta: Kementerian Kesehatan Republik Indonesia; 2013 [cited 2026 Jul 22]. Available from: <https://www.litbang.kemkes.go.id/laporan-riset-kesehatan-dasar-riskesdas/>.
- World Health Organization. Schizophrenia [Internet]. Geneva: World Health Organization; 2014 [cited 2026 Jul 22]. Available from: <https://www.who.int/news-room/fact-sheets/detail/schizophrenia>.
- Charlson FJ, Ferrari AJ, Santomauro DF, Diminic S, Stockings E, Scott JG, et al. Global epidemiology and burden of schizophrenia: findings from the Global Burden of Disease Study 2016. *Schizophr Bull*. 2018;44(6):1195-203.
- World Health Organization. World mental health report: transforming mental health for all [Internet]. Geneva: World Health Organization; 2022 [cited 2026 Jul 22]. Available from: <https://www.who.int/publications/i/item/9789240049338>.
- Hasan A, Falkai P, Wobrock T, Lieberman J, Glenthøj B, Gattaz WF, et al. World Federation of Societies of Biological Psychiatry (WFSBP) guidelines for biological treatment of schizophrenia. Part 1: update 2020 on the acute treatment of schizophrenia and the management of treatment resistance. *World J Biol Psychiatry*. 2020;21(4):275-356.
- National Institute for Health and Care Excellence. Psychosis and schizophrenia in adults: prevention and management (CG178) [Internet]. London: NICE; 2020 [cited 2026 Jul 22]. Available from: <https://www.nice.org.uk/guidance/cg178>.
- Correll CU, Gallego JA, Kane JM. Antipsychotic polypharmacy: a comprehensive evaluation of relevant correlates of a longstanding clinical practice. *Psychiatr Clin North Am*. 2017;40(3):507-26.
- Ministry of Health of the Republic of Indonesia. Regulation of the Minister of Health of the Republic of Indonesia Number 26 of 2020 concerning Standards for Pharmaceutical Services in Hospitals. Jakarta: Ministry of Health of the Republic of Indonesia; 2020.
- World Health Organization. International statistical classification of diseases and related health problems. 10th revision (ICD-10): 2019 version. Geneva: World Health Organization; 2019.
- Barnes TRE, Paton C. Antipsychotic polypharmacy in schizophrenia: benefits and risks. *CNS Drugs*. 2011;25(5):383-99.
- Dewi R, Mitra AD, Adinda R. Rasionalitas penggunaan antipsikotik pada pasien skizofrenia di Rumah Sakit Jiwa Daerah Provinsi Jambi periode April-Mei 2022. *Ibnu Sina J Kedokt Kesehat*. 2024;23(2):215-26.
- Fitriana AD, Hardian, Dini IRE. Evaluasi rasionalitas penggunaan obat antipsikotik pada pasien skizofrenia remaja di rawat inap RSJD Dr. Amino Gondohutomo Provinsi Jawa Tengah. *Generics J Res Pharm*. 2024;4(2):148-53.

17. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Text revision. Washington (DC): American Psychiatric Association; 2022.
18. Putri IA. Skizofrenia: suatu studi literatur. *J Public Health Med Stud.* 2022;1(1):1-12.
19. Mashudi M, Sari DK, Putri AR. Karakteristik pasien skizofrenia berdasarkan faktor sosiodemografi dan klinis di rumah sakit jiwa Indonesia. *J Keperawatan Jiwa.* 2021;9(2):241-50.
20. Ochoa S, Usall J, Cobo J, Labad X, Kulkarni J. Gender differences in schizophrenia and first-episode psychosis: a comprehensive literature review. *Schizophr Res Treat.* 2012;2012:916198.
21. McCutcheon RA, Reis Marques T, Howes OD. Schizophrenia: an overview. *JAMA Psychiatry.* 2020;77(2):201-10.
22. Alhatab MA, Mohammed SA. Sociodemographic and clinical characteristics of patients with schizophrenia attending psychiatric services. *Indian J Forensic Med Toxicol.* 2020;14(4):1667-72.
23. Vaingankar JA, Abdin E, Chong SA, Shafie S, Sambasivam R, Zhang YJ, et al. The association of mental disorders with perceived social support, and the role of marital status: results from a national cross-sectional survey. *Arch Public Health.* 2020;78(1):108.
24. Maulana MR, Fitriana QA. Eksplorasi dinamika psikologis pada individu dengan skizofrenia paranoid melalui perspektif psikologi kognitif. *Character J Penelit Psikol.* 2026;13(2):756-67.
25. Trotta A, Kang J, Stahl D, Yiend J. Interpretation bias in paranoia: a systematic review and meta-analysis. *Clin Psychol Sci.* 2021;9(1):3-23.
26. Taylor D, Barnes TRE, Young AH. The Maudsley prescribing guidelines in psychiatry. 14th ed. Hoboken (NJ): Wiley-Blackwell; 2021.
27. American Psychiatric Association. The American Psychiatric Association practice guideline for the treatment of patients with schizophrenia [Internet]. Washington (DC): American Psychiatric Association; 2020 [cited 2026 Jul 22]. Available from: <https://psychiatryonline.org/doi/book/10.1176/appi.books.9780890424841>.

