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Research Article

Trend in the Utilization of Antipsychotics in the National Health Coverage Era in Indonesia: A Cross-Sectional Study

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Abstract

The utilization pattern of antipsychotics has undergone significant changes since the introduction of atypical antipsychotics. Currently, medication for patients with schizophrenia predominantly uses atypical antipsychotics rather than typical antipsychotics. This study aimed to present the updated utilization pattern of antipsychotics among Indonesians. A cross-sectional study was conducted in 2019-2020 at the National Mental Hospital in Indonesia. Data were collected from medication-used reports from either inpatients or outpatients. A descriptive analysis was conducted to present the pattern and the annual total cost for each antipsychotic used. The pattern of typical antipsychotics used from 2019 to 2020 was likely to decline. The total cost estimated for typical antipsychotics in 2019 was IDR 475 million, and IDR 420 million in 2020. Trifluoperazine 5 mg was the most commonly typical antipsychotic used, followed by chlorpromazine 100 mg and haloperidol 5 mg. Eventually, the pattern of atypical antipsychotics used was likely to increase. The total cost was estimated at IDR 3.2 billion in 2019 and IDR 3.8 billion in 2020. Risperidone 2 mg was the most commonly atypical antipsychotic used, followed by clozapine 25 mg and risperidone 3 mg. This study proves the trend toward increased atypical antipsychotics used. Accordingly, the cost of schizophrenia treatment was elevated.

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INTRODUCTION

Mental disorders represent a significant global health burden, accounting for nearly one-third of all years lived with disability (YLDs) according to the World Health Organization (WHO)[1]. Antipsychotics have become a cornerstone of treatment for various mental health conditions, particularly schizophrenia[2]. The introduction of chlorpromazine in the 1950s revolutionized schizophrenia treatment, followed by the development of additional antipsychotics. This led to a rise in antipsychotic prescribing for a broader range of mental disorders[3].

Two main classes of antipsychotics are typically used: typical and atypical. Typical antipsychotics, such as haloperidol, chlorpromazine, and trifluoperazine, effectively manage positive symptoms of schizophrenia but can cause extrapyramidal side effects (EPS)[4]. Atypical antipsychotics, including clozapine, risperidone, quetiapine, olanzapine, and aripiprazole, offer broader symptom control (positive and negative) with a lower risk of EPS[5]. While atypical antipsychotic monotherapy is currently preferred for schizophrenia due to its improved side effect profile and positive impact on quality of life, combination or polypharmacy regimens are still commonly used[2,6]. Polypharmacy can lead to issues like non-adherence, increased drug-drug interactions, and adverse effects, including metabolic problems and higher medication costs[7].

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Schizophrenia is one of nine chronic diseases covered by Indonesia's national health program[8]. The economic burden of schizophrenia is significant, with estimates suggesting annual costs of 100 billion USD for rehospitalizations and 290 USD per patient due to non-adherence[9]. In Indonesia alone, the annual cost of illness per schizophrenia patient is estimated at 32 million IDR[10].

As defined by the WHO, drug utilization refers to "the marketing, distribution, prescription, and use of drugs in society with special emphasis on the resulting medical, social, and economic consequences"[11,12]. Drug utilization studies provide valuable insights into medication prescribing patterns and their use in disease management. Given the widespread use of antipsychotics and the potential economic and health-related consequences associated with polypharmacy, this study aims to describe and evaluate the utilization patterns and costs of antipsychotics in the treatment of mental disorders.

MATERIALS AND METHODS

Materials

Data on antipsychotic usage patterns and annual costs were obtained from the Pharmacy Department of Menur Mental Hospital, Surabaya, East Java, Indonesia. This study was designed to adhere to the ethical principles outlined in the Declaration of Helsinki[13]. The study protocol was approved by the Ethics Committee of Menur Mental Hospital, Surabaya, East Java, Indonesia (reference number: 070/7556/305/2019).

Methods

A cross-sectional study was conducted from 2019 to 2020 to collect data on medication use among inpatients and outpatients at the National Mental Hospital in Indonesia. The study included patients with a diagnosed mental disorder, regardless of their inpatient or outpatient status. Data were collected retrospectively from pharmacy department reports spanning the two-year period.

Data analysis

This study employed a descriptive analysis to investigate the epidemiology of mental disorders, antipsychotic medication utilization patterns, and associated costs within the hospital setting. We collected data on the following epidemiology patterns of mental disorders, percentage of typical and atypical antipsychotics used, pattern of long-acting injection (LAI) use, and annual total cost for each antipsychotic used.

RESULTS AND DISCUSSION

We analyzed antipsychotic utilization data retrieved from the Pharmacy Department's usage reports for a two-year period, January 2019 to December 2020. Schizophrenia was the most frequently diagnosed mental health disorder in tertiary referral hospitals, accounting for 64.87% of cases in 2019 and 48.52% in 2020. These findings suggest that a substantial proportion of antipsychotic medications dispensed are likely used for schizophrenia treatment.

Patterns of antipsychotics use

Schizophrenia emerged as the most prevalent mental health disorder among both inpatients and outpatients in the present study, followed by disorders stemming from brain damage and dysfunction. These findings align with previous research by Sweileh *et al.*[3], Patted *et al.*[4], and Thakkar *et al.*[14], who identified schizophrenia as a leading indication for antipsychotic medication. As illustrated in **Figure 1**, the use of atypical antipsychotics steadily increased from 57% in 2019 to 63% in 2020. Conversely, the use of typical antipsychotics exhibited a declining trend, dropping from 43% to 37% over the same period.

Our study revealed a rising trend in the use of atypical antipsychotics for schizophrenia treatment. This suggests a shift in treatment practices, with atypical medications becoming the preferred first-line therapy. These findings contrast with studies from Palestine and Sudan, where typical antipsychotics reportedly comprised 85.7% and 93.9% of prescribed medications, respectively[3,15]. This difference aligns with observations from other studies conducted in India, the USA, Japan, and Canada, which documented widespread use of atypical antipsychotics for mental illness[2,16-18]. It's important to acknowledge that

economic considerations often influence antipsychotic prescribing patterns in low-income countries, where the lower cost of typical medications may lead to their continued dominance[19].

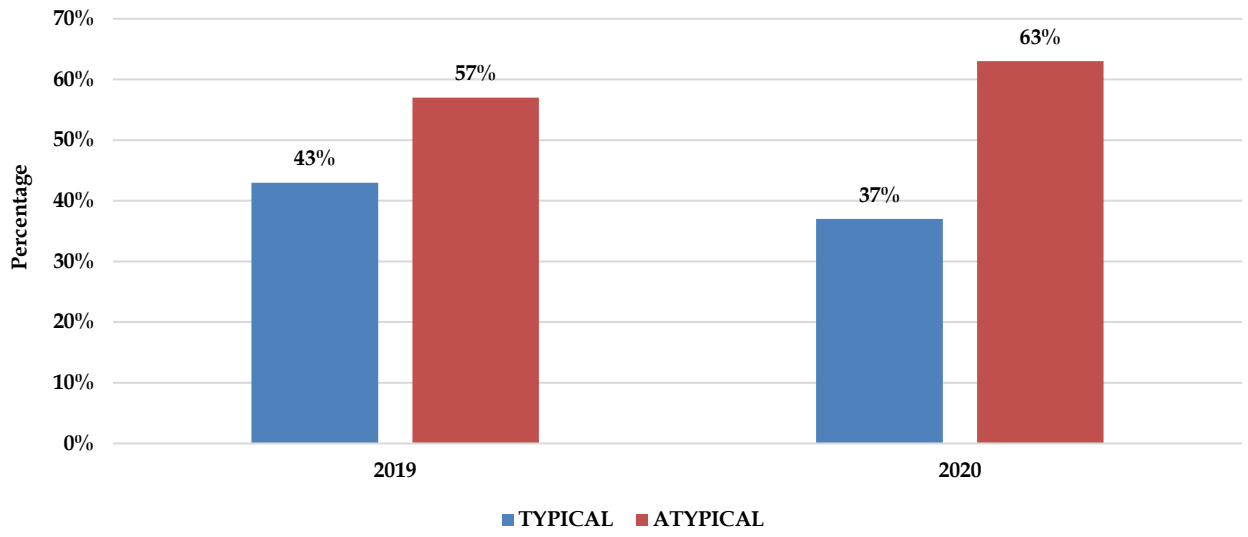

Figure 1. Use of typical and atypical antipsychotics in 2019 and 2020.

Figure 2 depicts the most frequently prescribed typical antipsychotics in 2019-2020. Trifluoperazine 5 mg emerged as the most commonly used medication (56.53%), followed by chlorpromazine 100 mg (21.95%) and haloperidol 5 mg (16.84%). **Figure 3** illustrates the most widely used atypical antipsychotics during the same period. Risperidone 2 mg stood out as the most prescribed medication in this category (33.23%), with clozapine 25 mg (24.51%) and risperidone 3 mg (22.07%) following closely behind.

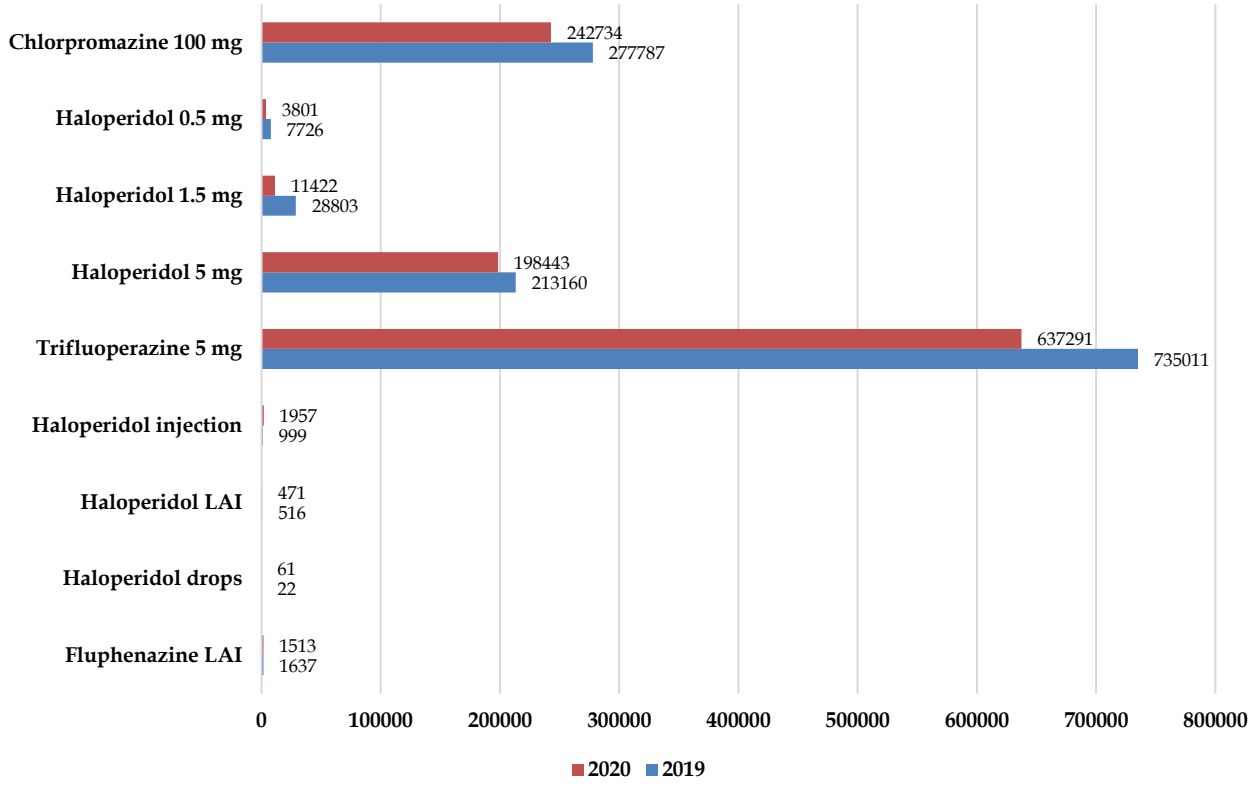

Figure 2. Number of typical antipsychotics use in 2019 and 2020.

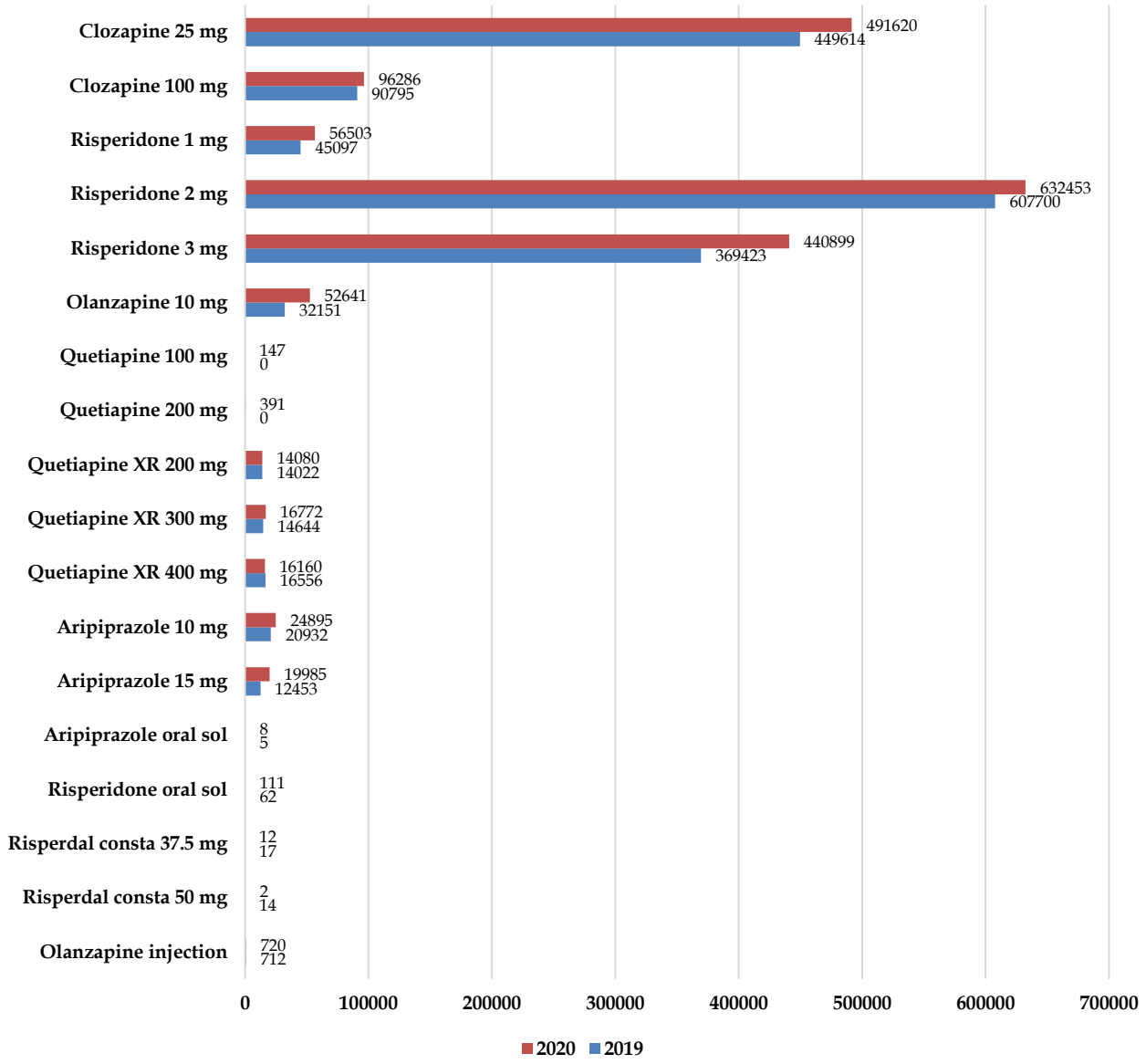

Figure 3. Number of atypical antipsychotics use in 2019 and 2020.

The National Mental Hospital, specializing in complex cases, may explain the observed higher use of clozapine, the second most commonly prescribed atypical antipsychotic. Clozapine is often reserved for patients with refractory schizophrenia or those who do not respond adequately to other atypical antipsychotics, aligning with established clinical guidelines for first-episode schizophrenia treatment, which recommend risperidone and aripiprazole as first-line options[20]. Trifluoperazine emerged as the most commonly prescribed typical antipsychotic in our study. This aligns with findings from a study in India[14]. However, these observations differ from reported practices in Palestine and Sudan, where chlorpromazine and haloperidol, respectively, were the preferred choices[15]. The cost-effectiveness of chlorpromazine and haloperidol might explain their wider use in low-income settings compared to middle- or high-income countries.

Risperidone, with a variable dosage of 2 mg, was the most commonly used atypical antipsychotic in this study. This finding is consistent with research conducted in Korea, Spain, Pakistan, and Canada, where risperidone was similarly favored[19,21-23]. Several factors likely contribute to risperidone's widespread use, including its affordability, availability in various dosage forms, and a generally lower risk of metabolic side effects compared to olanzapine and quetiapine[24]. However, our results diverge from those reported in Turkey, the USA, and India, where quetiapine and olanzapine, respectively, were prescribed more frequently[16,25].

Annual cost of antipsychotic

Our analysis of antipsychotic medication costs revealed distinct trends for atypical and typical medications over the two-year study period (**Figure 4**). The total annual cost of atypical antipsychotics exhibited an increasing trend, rising from IDR 3.2 billion in 2019 to IDR 3.8 billion in 2020. Conversely, the total annual cost of typical antipsychotics showed a decreasing trend, with costs dropping from IDR 475 million in 2019 to IDR 420 million in 2020. **Table I** provides a detailed breakdown of the total costs for each atypical and typical antipsychotic medication, respectively.

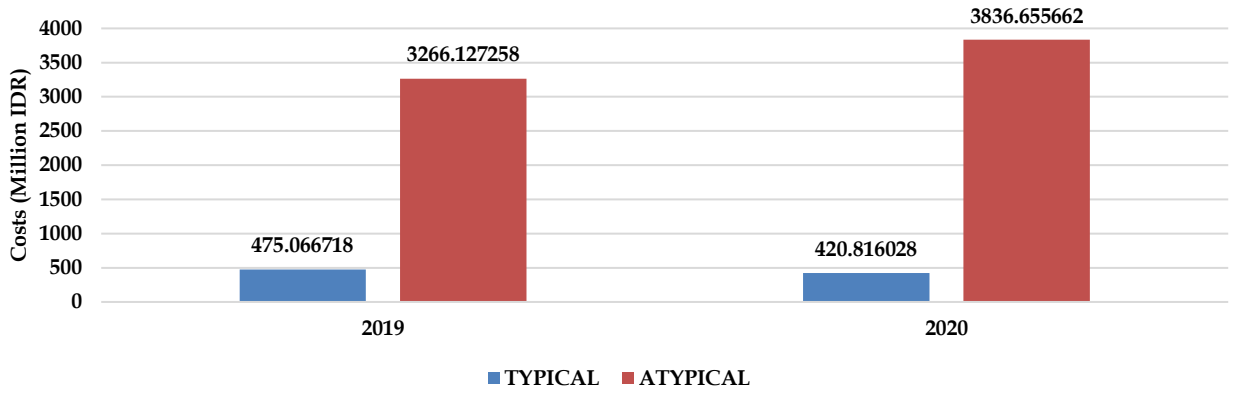

Figure 4. Total cost of typical and atypical antipsychotics in 2019 and 2020.

Table I. Total cost of typical and atypical antipsychotics in 2019 and 2020.

Name of drug	Strength of dose	Total cost of drug per year (IDR)	
		2019	2020
Haloperidol	0.5 mg	424,930	212,856
	1.5 mg	1,699,377	673,898
	5 mg	12,789,600	11,906,580
Haldol decanoate injection*	50 mg/mL	52,270,800	47,712,300
Lodomer injection	2 mg/mL	11,373,615	16,443,355
Lodomer drops	2 mg/mL	439,010	1,217,255
Trifluoperazine	5 mg	205,343,621	182,048,405
Stelazine	5 mg	17,731,424	2,345,207
Sikzonoate injection*	25 mg/mL	104,745,082	96,810,666
Chlorpromazine	100 mg	52,223,956	60,248,000
Cepezet	100 mg	-	431,145
Abilify	10 mg	482,147,688	573,431,430
	15 mg	345,675,600	559,871,136
	Oral solution	-	3,941,580
Arinia	15 mg	51,736,000	85,207,500
Clozapine	25 mg	460,079,699	501,580,240
	100 mg	291,872,472	310,748,880
Clorilex	25 mg	11,984,400	8,910,440
	100 mg	8,303,400	15,705,228
Sizoril	25 mg	306,295,640	106,272,738
	100 mg	-	2,727,296
Risperidone	1 mg	10,823,280	13,560,720
	2 mg	159,669,580	165,935,077
	3 mg	162,546,120	193,995,560
Rizodal	2 mg	313,072,500	76,773,150
Neripros	2 mg	21,956,040	7,462,917
Neripros oral solution	1 mg/mL	15,686,000	26,633,673
Risperdal consta	37.5 mg	18,849,600	10,452,332
	50 mg	19,771,500	1,924,923
Olanzapine	10 mg	151,355,925	248,653,125
Zyprexa injection	10 mg	100,666,832	101,797,920
Zyprexa zydis	10 mg	6,331,273	858,477
Serequel XR	200 mg	213,975,720	214,860,377
	300 mg	242,958,604	278,264,252
	400 mg	328,884,940	321,018,400
Quetvell	100 mg	-	1,474,758
	200 mg	-	4,593,530

Despite their higher cost compared to typical antipsychotics, several factors contribute to the widespread use of atypical antipsychotics in Indonesia. Firstly, atypical antipsychotics are more readily available in the country, with most being covered by National Health Insurance. Secondly, the Indonesian Psychiatric Society recommends atypical antipsychotics as the first-line treatment for schizophrenia. This preference stems from their potential advantages, including greater efficacy in managing both negative and positive symptoms, improved cognitive function in patients, and a higher quality of life. Additionally, atypical antipsychotics are associated with fewer EPS, a side effect that can significantly impact patient adherence to treatment regimens[26]. Poor adherence can lead to increased overall medication costs, creating a financial burden for patients and their families[27]. While atypical antipsychotics are typically eight to nine times more expensive than typical options, the long-term benefits they offer may justify the higher cost.

The cost of antipsychotic medication is influenced by both dosage and treatment duration. As shown in **Table I**, trifluoperazine was the most expensive typical antipsychotic per unit per year, followed by chlorpromazine and haloperidol. Among atypical antipsychotics, aripiprazole was the costliest per unit per year, followed by clozapine and quetiapine. The higher prices of aripiprazole and quetiapine can likely be attributed to the limited availability of generic versions of these medications. Risperidone, a more affordable atypical antipsychotic, is consequently used more widely in Indonesia[28].

Long-acting injection antipsychotics

Our study found that among the three currently available and nationally formulated LAIs in Indonesia (haloperidol-LAI, fluphenazine-LAI, and risperidone-LAI), fluphenazine-LAI was the most frequently used, followed by haloperidol-LAI and risperidone-LAI (**Table I**). This trend likely reflects the significantly higher cost of risperidone-LAI compared to the other two options[29]. In contrast to Indonesia's current focus on typical LAIs, high-income countries tend to favor atypical LAIs such as risperidone-LAI, paliperidone-LAI, and aripiprazole-LAI. These atypical LAIs offer several advantages, including the potential for shorter hospital stays, reduced need for daily medication administration, improved relapse prevention, and fewer hospital admissions[17,29-31]. However, it is important to acknowledge that both oral and atypical LAIs have potential drawbacks, including the risk of metabolic abnormalities like obesity, hypertension, hyperglycemia, and dyslipidemia[32].

CONCLUSION

This study highlights schizophrenia as the most frequently diagnosed mental disorder in tertiary referral hospitals within the context of national health coverage. While atypical antipsychotics, generally more expensive than typical medications, are widely distributed, the use of LAI antipsychotics remains dominated by conventional LAIs. This pattern warrants further investigation to determine if cost considerations or other factors are influencing the choice of LAI medications.

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AUTHORS' CONTRIBUTION

Conceptualization: Julaeha, Verra Yuliana, Josephine Paramita Ayuningtyas
Data curation: Julaeha
Formal analysis: Julaeha, Verra Yuliana, Josephine Paramita Ayuningtyas
Funding acquisition: Julaeha
Investigation: Julaeha

Methodology: Julaeha
Project administration: Julaeha, Verra Yuliana, Josephine Paramita Ayuningtyas
Resources: Verra Yuliana, Josephine Paramita Ayuningtyas
Software: -
Supervision: Verra Yuliana, Josephine Paramita Ayuningtyas
Validation: Julaeha
Visualization: Julaeha
Writing - original draft: Julaeha, Verra Yuliana, Josephine Paramita Ayuningtyas
Writing - review & editing: Julaeha

DATA AVAILABILITY

None.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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