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Modifiable Factors Associated with Relapse Among Patients with Schizophrenia in West Kalimantan: A Cross-sectional Study

INTRODUCTION

Mental disorders represent a major global health challenge. Their prevalence varies significantly across populations and age groups, underscoring their importance as a global public health concern. Recent studies estimate that approximately 11.63% of individuals aged 5-24 years experienced at least one mental disorder, with the highest rates observed in adolescents and young adults (Kieling et al., 2024). In Indonesia, the 2023 Indonesia Health Survey reported that around 2% of the population aged 15 years and older, equivalent to approximately 8.6 million people, experience mental health problems (Health, 2023). Within this national context, West Kalimantan faces a considerable burden, with a survey reporting a provincial prevalence of schizophrenia or psychosis at around 7 per 1,000 households (Kemenkes RI, 2018). More recent service data also indicate that thousands of individuals with severe mental illness continue to receive treatment annually in the province, reflecting both the ongoing challenges and the pressing need for targeted interventions. Among various mental disorders, schizophrenia is a major contributor to this burden.

Schizophrenia (SCZ) is a complex mental health disorder marked by a range of symptoms that significantly impair multiple domains, including cognitive, emotional, and social (Zheng et al., 2023). It is characterized by positive and negative symptoms, such as hallucinations, delusions, social withdrawal, and lack of motivation. More than 52% individuals with schizophrenia have been reported to experience relapse during the course of illness that can reduce the quality of life of both patients and their families (Agenagnew & kassaw, 2020; Pothimas et al., 2020).

A wide range of factors has been linked to schizophrenia relapse. While some are non-modifiable, such as illness duration, others are potentially modifiable and therefore especially relevant for intervention. These include medication adherence, internalized stigma, and family support (Abdisa et al., 2020; Adebiyi et al., 2018; Zubi et al., 2022). Medication non-adherence has consistently been identified as one of the most powerful predictors of relapse, with poor adherence more than doubling the risk (Guo et al., 2023; Semahegn et al., 2020). Internalized stigma is another important risk factor, as it undermines self-esteem and reduces motivation to

engage in care, which in turn increases the likelihood of relapse (Abdisa et al., 2020). Family support has also been shown to promote treatment adherence and recovery, whereas weak or absent support can exacerbate vulnerability to relapse (Rodolico et al., 2022).

Despite the growing global literature, little is known about how these factors interact in the Indonesian context, particularly in resource-limited regions such as West Kalimantan. Addressing this knowledge gap is essential to inform targeted interventions and reduce the relapse burden. Therefore, this study aimed to identify the most dominan factors associated with relapse among patients with schizophrenia treated at West Kalimantan Provincial Mental Hospital. This study aims to identify the factors most closely associated with relapse among patients with schizophrenia at the West Kalimantan Provincial Mental Hospital.

METHODS

This study used a descriptive correlational design with a cross-sectional approach. The independent variables consisted of family support, internalized stigma and treatment compliance, while the dependent variable was the relapse of schizophrenia patients. This study was conducted at the West Kalimantan Provincial Mental Hospital in February, 2024. The population in this study were schizophrenia patients admitted to the West Kalimantan Provincial Mental Hospital. The sample in this study used a power analysis calculation with a significance value of 0.05, an effect size of 0.5 and a power of 0.80, so that the sample in this study was 63 families who cared for people with mental disorders. The sample was selected using consecutive sampling technique. The criteria in this study are as follows: 1) Patients do not experience cognitive function disorders; 2) Patients who are delivered or cared for by their families; 3) Nurses in the inpatient room and outpatient clinic; 4) Families who live in the same house as the patient; 5) Willing to be a respondent.

Data collection used questionnaires adopted from previous studies. The questionnaires used included the family support questionnaire, Internalized Stigma of Mental Illness 9 (ISMI9), Morisky Medication Adherence Scale 8 (MMAS-8). Respondents who met the inclusion criteria were given 30 minutes to complete the ISMI-9 and MMAS-8 questionnaires, while the family support questionnaire was completed by family members using a Google form that had been provided and could be completed at home.

Data were coded, entered into a database, and verified for accuracy. Inappropriate data were cleaned before analysis. Data processing was performed using SPSS version 26 (IBM Corp., 2019). Descriptive statistics, including frequency distributions, were used to analyze respondent characteristics (age, gender, education, and employment), as well as the variable for internalized stigma, medical adherence, social support, and lifetime relapse. The relationship between the independent and dependent variables was examined using the Chi-Square test. Multivariate logistic regression was conducted to identify the most dominant factors associated with relapse among schizophrenia patients.

This study has received ethical approval from the Health Research Ethics Committee (KEPK) of STIKes Yarsi Pontianak with number: 155/KEPK/STIKes.YSI/XI/2024.

RESULTS

Table 1 Frequency Distribution of Respondent Characteristics (N=63)

Characteristics	f	%	Mean
Age			38.73
Gender			
Male	63	100	
Education			
No schooling	9	14.2	
Elementary school	18	28.6	
Junior high school	19	30.2	
Senior high school	17	27.0	
Type of employment			
Unemployed	40	63.5	
Civil servant	2	19.0	
Private	12	3.2	
Farmer/laborer/fisherman	9	14.3	

The mean age of the respondents was 38.73 years, and the sample comprised exclusively male participants (100%). Regarding education, the majority of respondents had attained junior high school completion (30.2%) and were unemployed (63.5%).

Table 2 Distribution of Factors Associated with Relapse in Schizophrenia Patients (N=63)

Variable	f	%
Internalized stigma		
Minimal-none	15	23.8
Mild	36	57.1
Moderate	5	7.9
Severe	7	11.1
Medical adherence		
High	25	39.7
Medium	11	17.5
Low	27	42.9
Family support		
Poor	10	15.9
Moderate	47	74,6
Strong	6	9.5

Regarding internalized stigma, over half of the respondents (57.1%) reported experiencing mild stigma, whereas 23.8% indicated minimal to no stigma. A minority of individuals reported moderate (7.9%) and severe (11.1%) stigma. In terms of medical adherence, 39.7% of patients exhibited high adherence, while 42.9% displayed low adherence. This is a significant concern, as inadequate medication adherence is a recognized predictor of

relapse in schizophrenia. A total of 17.5% exhibited medium adherence. Regarding family support, a significant majority (74.6%) reported moderate levels, while only 9.5% indicated strong support and 15.9% noted poor support.

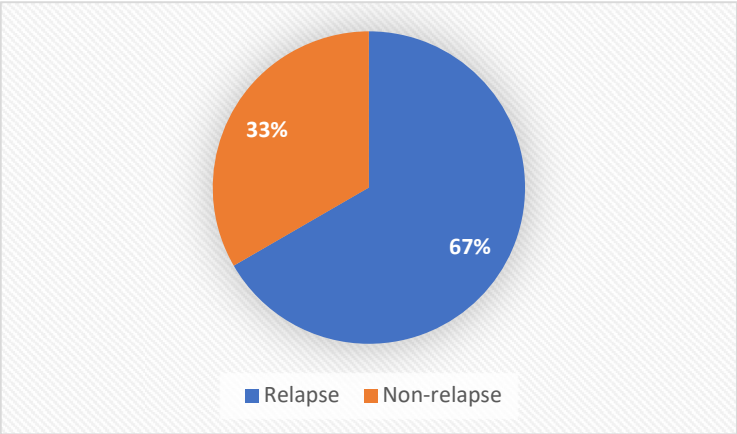

Figure 1 Lifetime Relapse of Schizophrenia Patients (N=63)

Based on figure 1, most respondents experienced lifetime relapse (67%).

Table 3 The Relationship Between Internalized Stigma, Treatment Adherence, and Family Support with Relapse in Schizophrenia Patients (N=63)

Variable	Relapse				Total		
	Relapse		Non-relapse				
	f	%	f	%	f	%	
Internalized stigma							
Minimal to none	7	46.7	8	53.3	15	100	
Mild	26	72.2	10	27.8	36	100	0.217
Moderate	3	60	2	40	5	100	
Severe	6	85.7	1	14.3	7	100	
Medical adherence							
High	13	48.1	14	51.9	27	100	0.026
Medium	9	81.9	2	18.2	11	100	
Low	20	80	5	20	25	100	
Family support							
Strong	4	40	6	60	10	10	0.121
Moderate	5	83.3	1	16.7	6	10	
Poor	33	70.2	14	29.8	47	10	

The table showed that internalized stigma was not significantly associated with relapse (p-value 0.217). However, descriptively, patients who experienced severe internalized stigma had the highest proportion of relapse (85.7%) compared to those with moderate (60%), mild

(72.2%), or minimal to no stigma (46.7%). In contrast, medication adherence demonstrated a statistically significant relationship with relapse (p-value 0.026). Patients with low adherence exhibited the highest relapse rate (80%), whereas those with high adherence had a notably lower relapse rate (48.1%). The analysis result also shows there is no relationship between family support and relapse (p-value 0.121). Nonetheless, the descriptive distribution showed that patients with poor family support had a higher relapse rate (70.2%) compared to those with moderate (83.3%) or strong family support (40%).

Table 4 Factors Associated with Relapse Among Patients with Schizophrenia (N=63)

	Variable	B	df	*p*	Exp (B)	95% CI EXP(B)	
						Lower	Upper
Step 1	Internalized stigma	-.511	1	.186	.600	.281	1.279
	Medical adherence	.722	1	.032	2.059	1.062	3.990
	Family support	-1.006	1	.115	.366	.105	1.279
	Constant	.681	1	.676	1.975		
Step 2	Medical adherence	.738	1	.027	2.091	1.087	4.023
	Family support	-1.020	1	.094	.360	.109	1.191
	Constant	-.340	1	.808	.712		

Table 4 shows a multivariate logistic regression analysis using the forward method. In the final model (Step 2), medication adherence remained significantly associated with relapse among patients with schizophrenia (p-value 0.027). The odds ratio (OR) for medical adherence was 2.091 (95% CI: 1.087–4.023), indicating that patients with lower adherence were approximately 2 times more likely to experience a relapse compared to those with higher adherence.

Family support, while not reaching statistical significance in the final model (p = 0.094), demonstrated a protective trend against relapse, with an OR of 0.360 (95% CI: 0.109–1.191). This suggests that stronger family support may reduce the likelihood of relapse, although the confidence interval includes unity and the result should therefore be interpreted cautiously. Internalized stigma was not retained in the final stepwise model due to its non-significant contribution (p = 0.186 in Step 1). Overall, the multivariate analysis highlights low medication adherence as the strongest independent predictor of relapse among the variables studied.

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DISCUSSION

The aim of our study is to examine modifiable factors associated with relapse among schizophrenia patients in West Kalimantan. The logistic regression analysis show that medication adherence was the most independent predictor of relapse, with patients who had lower adherence being twice as likely to experience relapse compared to those with higher adherence (OR = 2.091, 95% CI: 1.087-4.023). This underscores the critical role of consistent pharmacological interventions in maintaining clinical stability and preventing symptomatic deterioration. Previous research consistently supports this finding, with studies highlighting poor adherence as the most robust predictor of relapse across diverse settings (Mi et al., 2020). Adherence to medication is crucial for alleviating symptoms of this health issue, minimising relapses and readmissions, and attaining treatment objectives (Karabulut & Uslu, 2024). More recent systematic reviews also confirm that structured adherence-enhancement interventions, including psychoeducation and behavioral programs, significantly improve adherence and reduce relapse-related outcomes (Guo et al., 2023; Ha et al., 2017). In addition, emerging randomized trials indicate that digital interventions such as smartphone-based adherence applications can enhance medication adherence and may be feasible in outpatient and community setting (Chen et al., 2023).

Medication adherence represents a multifaceted behaviour encompassing a sequence of interrelated actions that engage patients, healthcare providers, and the broader healthcare system (Schneider & Burnier, 2022). It is defined as “the process by which patients take their medication as prescribed,” encompassing three measurable stages: initiation, implementation, and discontinuation (Cahir, 2020). Non-adherence, commonly characterised as the intake of less than 80% of prescribed doses, has been demonstrated to be a valid predictor of subsequent hospitalisation (Kareem & Mahmood, 2022). Among individuals with schizophrenia or bipolar disorder, factors associated with poor medication adherence include adverse drug effects, limited insight into the illness, cognitive impairments, complex treatment regimens, and comorbid substance use (Rohmi et al., 2023; Zaouali et al., 2025).

Internalized stigma was not statistically associated with relapse, which contrary with previous study conducted by previous studies (Abdisa et al., 2020; Chukwuma et al., 2024). The absence of a significant association in our study may reflect the relatively small sample size and the exclusively male demographic, which may limit the variability of stigma* experiences. Cultural factors may also play a role, as stigma in collectivist societies can manifest differently compared with Western contexts, potentially diluting its direct statistical effect. Nevertheless, the descriptive patterns suggest that stigma could indirectly contribute to

relapse by eroding motivation for treatment adherence and engagement with services, warranting further longitudinal investigation.

Similarly, family support did not reach statistical significance, but the observed protective trend (OR = 0.360) and descriptive findings indicate its potential importance. Patients with strong family support had the lowest relapse rates (40%), whereas those with poor support relapsed more frequently (70.2%). These findings are consistent with recent reviews demonstrating that family-based interventions, including psychoeducation and structured family therapy, reduce relapse and improve adherence (Kim & Park, 2023). Furthermore, studies conducted in low and middle-income countries (LMICs) have shown that strengthening family support through empowerment-based interventions reduce relapse risk and enhances recovery outcomes (Iswanti et al., 2024). While our findings were not statistically significant, the observed trend underscores the practical importance of involving families in relapse prevention strategies, particularly in LMIC settings where family caregivers provide the backbone of psychiatric support.

There are several implications of this study. Nurses and stakeholders should prioritize interventions to enhance medication adherence through psychoeducation, motivational interviewing or digital adherence monitoring. Second, reducing stigma remains essential to prevent indirect negative effects, particularly in male populations who may be less willing to disclose or seek help. Strengthening family support should also be integrated into community mental health programs, especially in LMICs where professional resources are constrained and families play a central caregiving role.

This study has several strengths, including its focus on an under-researched population in West Kalimantan and the examination of multiple psychosocial factors within a single model. However, limitations must also be acknowledged. The relatively small, male-only sample restricts generalizability, and the cross-sectional design prevents causal inference. Despite these limitations, the study provides valuable insights into the role of adherence, stigma, and family support in relapse, contributing evidence from a regional often overlooked in the global schizophrenia literature.

CONCLUSIONS

This study underscores the critical role of medication adherence as the most significant modifiable factor influencing relapse among patients with schizophrenia in West Kalimantan. Patients with lower adherence were more than twice as likely to relapse, emphasizing

adherence as an urgent target for clinical intervention. Although internalized stigma and family support did not demonstrate statistically significant associations, their descriptive trends highlight their clinical relevance and potential indirect impact on relapse through treatment engagement and psychosocial stability. These findings provide important evidence from an under-researched Indonesian context, contributing to global understanding of relapse dynamics in schizophrenia.

For clinical practice, adherence-enhancement strategies, stigma-reduction initiatives, and family-based support programs should be integrated into community mental health care. At a policy level, these interventions align with the WHO Mental Health Action Plan 2013-2030, which prioritizes access to effective, community-based, family-inclusive care. Future studies employing larger, longitudinal designs are needed to confirm causeal relationships and evaluate the effectiveness of integrated adherence and psychosocial interventions in diverse cultural settings. Strengthening these dimensions of care may substantially reduce relapse rates, enhance recovery, and lessen the burden of schizophrenia on patients, families, and health systems.

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