

Association of Insight, Age, and Education Level with Relapse Rates in Schizophrenia Patients

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Abstract

Schizophrenia is a chronic mental disorder with a high tendency for relapse, which worsens the patient's prognosis and increases the burden of care. Clinical factors such as insight, as well as demographic factors including age and education level, are thought to play a crucial role in influencing treatment adherence and relapse risk. This study aims to analyze the association between insight, age, and education level with relapse rates in schizophrenia patients at RSJD dr. Arif Zainudin Surakarta. This was an analytic observational study with a cross-sectional design. Subjects were selected using purposive sampling, totaling 96 patients. Data were analyzed using Chi-Square test, Fisher's Exact test, and Logistic Regression. The results showed a significant association between insight ($p=0.045$) and education level ($p=0.046$) with relapse rates. Meanwhile, age ($p=0.588$) was found to have no significant association with relapse incidence. It is concluded that insight and education level are associated with relapse rates, although no single factor emerged as a dominant independent predictor in the multivariate model. Improving patient insight through psychoeducation is recommended to prevent relapse.

Keywords: Insight, Age, Education Level, Relapse, Schizophrenia

INTRODUCTION

Clinical manifestations in the form of cognitive distortions, perceptual abnormalities, affective disturbances, and behavioral changes are hallmarks of schizophrenia, a chronic major psychiatric disorder prone to relapse that can lead to deterioration in occupational functioning and quality of life. (1-3)

Global epidemiological data indicate that the prevalence of schizophrenia reaches approximately 24 million people, equivalent to 1 in every 300 individuals worldwide. (4) In Indonesia, the prevalence of schizophrenia has reached 6.7 per 1,000 households, indicating that approximately 6 to 7 households out of every 1,000 have a family member with schizophrenia. This figure represents a significant increase compared to the prevalence reported in 2013, which was 1.7 per 1,000 population. (5) In the national context, the urgency of addressing this issue is driven by the high rate of rehospitalization resulting from recurrent relapse episodes. (6,7) This highlights that schizophrenia remains a signifi-

cant global and national health burden requiring serious attention.

Relapse is defined as the re-emergence of disease symptoms or a deterioration in mental status similar to a previously experienced condition, indicating the need for clinical intervention to prevent further decline in patient functioning or stability. (8) In individuals with schizophrenia, relapse refers to the return of clinical symptoms that necessitate rehospitalization. This relapse is characterized by the re-emergence of psychotic symptoms, including worsening positive and negative symptoms, following a prior period of stability or remission. (9)

Patients with higher educational attainment tend to have a lower risk of relapse, mediated by better health literacy, greater understanding of the importance of treatment adherence, improved access to healthcare services, and more stable social and occupational engagement. (10) Conversely, low educational attainment is associated with an increased risk of relapse through several interrelated mechanisms.

Individuals with lower levels of education often have limited knowledge and understanding of the illness, which may reduce awareness of symptom progression and the importance of long-term treatment.

(11) This limited understanding is frequently accompanied by poor adherence to prescribed therapy. In addition, socioeconomic vulnerability associated with lower educational status may restrict access to healthcare services, continuity of care, and adequate social support, thereby further increasing the likelihood of relapse.

(12)

Patients with poor insight have a higher risk of relapse, mainly due to medication non-adherence. Failure to recognize the illness reduces motivation to continue antipsychotic treatment, leading to increased relapse and rehospitalization rates in large observational cohorts.(6) Sustained high insight has been associated with a marked reduction in rehospitalization rates, exceeding 90%. This indicates that insight acts as a protective factor against relapse by improving medication adherence, treatment acceptance, and early recognition of relapse symptoms.(13)

The risk of symptom recurrence in this severe psychiatric disorder is influenced by the interaction of various precipitating factors, including insight, age, and educational level.(14) However, findings regarding the role of these variables remain inconsistent when analyzed alongside other contributing factors. Insight, defined as the patient's ability to recognize the disorder they are experiencing, is often associated with treatment adherence,(15) while age and educational level are related to adaptability and health literacy.(16) Despite this knowledge, relapse rates remain high, suggesting that the interaction between these demographic and clinical factors requires further exploration to address inconsistencies reported in previous studies.

In Indonesia, particularly within inpatient services, the relapse rate among patients with schizophrenia remains high, indicating that relapse control has not been optimal.(7) The high volume of cases at

RSJD dr. Arif Zainudin Surakarta makes this mental health referral facility in Central Java a representative setting to investigate these determinants.(17) The urgency of this research lies in the need to analyze the specific associations between insight, age, and educational background with relapse frequency in this population, thereby providing a clearer picture of local determinants compared with general global data.

This study specifically aims to investigate the association of insight, age, and educational level with the risk of relapse in patients with schizophrenia. By utilizing a retrospective approach based on medical records, this research seeks to determine whether these variables significantly influence the frequency of rehospitalization among inpatients.

The findings of this study are expected to serve as a foundation for formulating more effective psychoeducation interventions and prevention strategies. By understanding the specific contributions of insight, age, and education to relapse, healthcare providers can design educational approaches tailored to patient characteristics, ultimately aiming to reduce relapse risk and improve the overall management of schizophrenia in clinical settings.

METHODS

This study employed a quantitative observational design with a cross-sectional approach. A cross-sectional study examines the association among variables by collecting data at a single point in time.¹⁸ The study was conducted at RSJD dr. Arif Zainudin Surakarta using secondary data obtained from medical records. A total of 96 patients diagnosed with schizophrenia between October and December 2025 were included in this study. Univariate analysis was conducted to describe the frequency and distribution of insight, age, educational level, and relapse rate. Bivariate analysis was performed to determine the association of insight, age, and educational level with relapse rate using the Chi-square test, with Fisher's Exact test used as an alternative for 2×2 tables in which expected cell

counts were less than 5. Odds ratios (ORs) were also calculated. Multivariate analysis using logistic regression was performed to determine the dominant factor associated with relapse.

RESULTS

The results provide an overview of respondent characteristics, including age, educational level, insight, and relapse rate. Data collected from 96 respondents at

RSJD dr. Arif Zainudin Surakarta revealed that the majority of subjects were in the young adult age group (56.3%) and had a low level of education (55.2%). Regarding clinical variables, a dominant proportion of respondents exhibited poor insight (95.8%). In terms of the dependent variable, more than half of the respondents (53.1%) experienced frequent relapses (Table 1).

Table 1. Distribution of Respondent Characteristics Based on Age, Education Level, Insight, and Relapse Frequency

Variables	Category	Frequency (%)
Insight	Poor	92 (95.8%)
	Good	4 (4.2%)
Age (Years)	Young Adult	54 (56.3%)
	Older Adult	42 (43.8%)
Educational Level	Low	53 (55.2%)
	High	43 (44.8%)
Relapse Frequency	Infrequent	45 (46.9%)
	Frequent	51 (53.1%)

The analysis indicated a significant relationship between insight and relapse frequency ($p = 0.045$). The data showed that patients with poor insight had a higher tendency to experience frequent relapses. Specifically, among 92 patients with poor insight, 51 (53.1%) experienced frequent relapses (Table 2).

In contrast, patients with good insight were exclusively found in the infrequent relapse category (100%), with none experiencing frequent relapses. This finding confirms that poor insight is significantly associated with an increased risk of relapse. In contrast, the statistical test for age yielded a p -value of 0.588, which was greater than the significance level of 0.05, indicating no significant relationship between age and relapse rate. Although the young adult group recorded a

slightly higher proportion of frequent relapses (31.1% of the total sample) compared with the older adult group (21.9%), this difference was not statistically significant. The distribution of relapse frequency remained relatively balanced across both age groups (Table 2).

The analysis of educational level showed a significant association with relapse rate ($p = 0.046$). Patients with a low level of education were found to have a higher incidence of frequent relapses, accounting for 34.4% of the total sample, compared with those with a higher level of education (18.8%). This finding suggests that patients with lower educational backgrounds are more vulnerable to recurrent relapses than those with higher educational attainment (Table 2).

Table 2. Association between Insight, Age, and Education Level with Relapse Frequency

Variables	Relapse Frequency				Total		<i>p-Value</i>
	Infrequent		Frequent				
	N	%	N	%	N	%	
Insight							0.045
Poor	41	42.7	51	53.1	92	95.8	
Good	4	4.2	0	0.0	4	4.2	
Total	45	46.9	51	53.1	96	100	
Age (Years)							0.588
Young Adult	24	25.0	30	31.3	54	56.3	
Older Adult	21	21.9	21	21.9	42	43.8	
Total	45	46.9	51	53.1	96	100	
Educational Level							0.046
Low	20	20.8	33	34.4	53	55.2	
High	25	26.0	18	18.8	43	44.8	
Total	45	46.9	51	53.1	96	100	

The evaluation of the logistic regression model demonstrated an acceptable fit, as indicated by a significant Omnibus Test ($p = 0.030$), an AUC of 0.631, a Brier Score of 0.230, and a Nagelkerke R^2 value indicating that 11.9% of the variance in relapse rate was explained by the model. Although the simultaneous test confirmed that insight, age, and educational level collectively influenced relapse rates, the partial analysis revealed that none of the variables

were individually significant (Insight $p = 0.989$; Age $p = 0.569$; Educational Level $p = 0.120$). Although the odds ratios suggested an increased risk associated with age ($OR = 1.277$) and educational level ($OR = 1.950$), these findings were not statistically significant. Therefore, it can be concluded that no single dominant variable significantly influenced schizophrenia relapse in this model (Table 3).

Table 3. Logistic Regression Model Evaluation and Partial Test Results

Brier Score	AUC	Nagelkerke R^2	Omnibus Test Sig.	Partial Test		
				Variable	Partial Sig. (p)	Exp(B) / OR
0.230	0.631	0.119	0.030	Insight	0.989	$1,878 \times 10^{-4}$
				Age	0.569	1,277
				Education Level	0.120	1,950

DISCUSSION

The results of the bivariate analysis indicated that insight has a significant association with relapse rates among patients with schizophrenia. Patients with poor insight tended to experience more frequent

relapses compared with those with good insight. These findings reinforce evidence that insight is a key component of long-term therapeutic success.(19-21) Consistent with these findings, Lindenmayer reported that impaired insight is one of the strongest

and statistically significant predictors of relapse, contributing significantly to relapse risk ($p = 0.011$).⁽¹⁹⁾ Similarly, a study by Vlachos found that patients who experienced relapse within one year had higher G12 scores (the PANSS item assessing clinical insight) ($p = 0.023$).⁽²²⁾

Conversely, the results of this study indicated that there was no significant association between age group (young adults versus older adults) and relapse rates in schizophrenia patients. This suggests that age, as a single demographic factor, is insufficient to predict relapse without considering other clinical and psychosocial factors.⁽²³⁻²⁵⁾ These findings are consistent with several previous studies. For instance, Alharthi reported no statistically significant association between age and the risk of relapse ($p = 0.61$).⁽²³⁾ Similarly, Bioque found that age at the onset of schizophrenia did not predict either the likelihood of relapse or the latency (time interval) to relapse ($p = 0.132$).⁽²⁶⁾ In addition, a study by Amalia and Hermawati reported that patient characteristics, including age, sex, marital status, educational level, and employment, were not associated with relapse rates ($p = 0.691$).⁽²⁵⁾

Educational level also demonstrated a significant association with relapse rates. Patients with lower educational attainment experienced frequent relapses more often than those with higher educational attainment.⁽²⁷⁾ Education is closely related to health literacy, which is defined as an individual's ability to understand health information and make informed decisions regarding disease management.

(16) Individuals with higher educational levels tend to have a better understanding of the importance of treatment adherence, early symptom recognition, and coping strategies, thereby reducing the risk of relapse.⁽²⁸⁾ This finding is consistent with research reported by Zhu, which showed that educational level had a significant association with relapse rate, although this relationship was indirect and mediated by

executive function and medication adherence.⁽¹⁶⁾ Furthermore, another study by Prabhawidiaswari demonstrated a strong association, indicating that lower educational attainment was linked to a higher frequency of relapse ($p = 0.03$).⁽²⁹⁾

Overall, the multivariate analysis using logistic regression demonstrated that the model was statistically significant (Omnibus Test $p = 0.030$), indicating that insight, age, and educational level collectively influenced the probability of relapse. The Brier Score (0.230) and Nagelkerke R^2 (11.9%) further indicated that these factors collectively contributed to patient outcomes. However, based on the partial test, no single variable emerged as the dominant independent predictor ($p > 0.05$ for all variables). This discrepancy between the significant simultaneous model and the non-significant partial results may be attributable to the relatively small sample size ($n = 96$), which may have been insufficient to support the variance contributed by three predictor variables in a multivariate model. Furthermore, this outcome may have been influenced by the extreme imbalance in data distribution, as 95.8% of the subjects fell into the poor insight category. This lack of variation may have reduced the statistical power of the individual predictors. Despite these statistical limitations, the findings suggest that relapse is a multifactorial phenomenon in which clinical factors (insight) and demographic factors (educational level) interact. Therefore, interventions should not focus on a single aspect but should instead adopt a comprehensive approach.

CLINICAL IMPLICATIONS

Given the significant association between education level and relapse, standard psychoeducation may not be universally effective. For patients with a lower educational background, psychoeducation should be tailored to their specific needs. This includes the use of simplified language, visual aids, and practical, repetitive demonstrations rather than complex theoretical explanations about the illness. Furthermore, in-

volving family members or caregivers in the psychoeducation process is crucial to bridge the health literacy gap, ensuring that the patient's support system can recognize early signs of relapse and assist with medication adherence. This comprehensive, patient-centered strategy is expected to enhance treatment adherence and significantly reduce the frequency of rehospitalization.

STUDY LIMITATIONS

This study has several limitations that should be acknowledged. Primarily, the reliance on secondary data from medical records inherently limits the depth and completeness of the clinical data obtained. Variables such as specific details of medication adherence, family support dynamics, and the precise nature of psychotic symptoms preceding relapse could not be explored comprehensively. Future studies utilizing a prospective design with primary data collection are recommended to further investigate these variables and validate the present findings.

CONCLUSION

Clinical insight and education level are significant factors associated with the incidence of relapse among patients with schizophrenia at RSJD dr. Arif Zainudin Surakarta. Patients with poor insight and a lower educational background demonstrate a higher susceptibility to frequent relapses, underscoring the importance of illness awareness and health literacy in maintaining clinical stability. Conversely, age was not found to be a significant predictor, indicating that the risk of relapse is driven more by clinical and psychosocial factors than by the patient's biological age.

From a multivariate perspective, although the variables collectively influence relapse risk, no single factor emerged as the dominant independent predictor. This finding suggests that schizophrenia relapse is a complex, multifactorial phenomenon. Therefore, clinical interventions should not rely on a single approach; instead, they should integrate psychoeducation programs

specifically designed to enhance insight and provide tailored support for patients with lower educational levels in order to effectively prevent recurrence.

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